SECTION BRC
BRAKE CONTROL SYSTEM

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PRECAUTION

PRECAUTIONS

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

INFOID:0000000006920603

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 SR and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision 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 SR section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, Do not use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

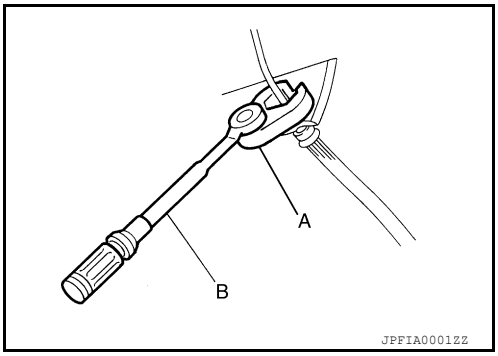
Precaution for Brake System

INFOID:0000000006920606

WARNING:

Clean any dust from the front brake and rear brake using a vacuum dust collector. Never blow by compressed air.

- Brake fluid use refer to MA-13, "Fluids and Lubricants".
- Do not reuse drained brake fluid.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Do not use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with a crowfoot (A) and torque wrench (B).
- Always connect the battery terminal when moving the vehicle.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



Precaution for Brake Control System

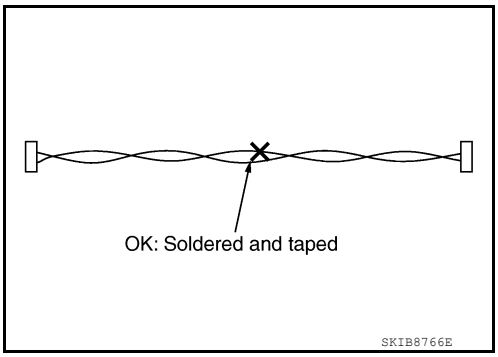
INFOID:0000000006920607

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

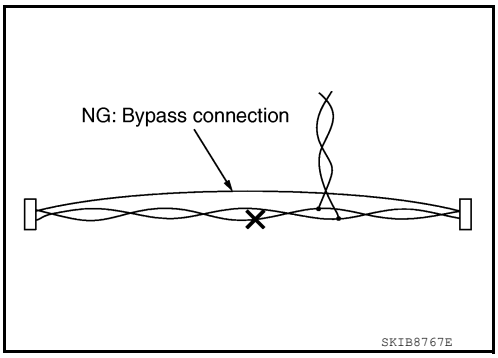
Precaution for Harness Repair

INFOID:0000000006920608

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



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



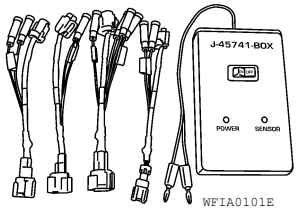
PREPARATION

PREPARATION

Special Service Tool

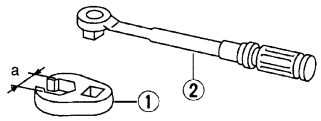
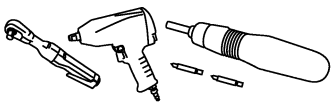
INFOID:0000000007049869

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV991J0080 (J-45741) ABS active wheel sensor tester  WFIA0101E	Checking operation of ABS active wheel sensors

Commercial Service Tools

INFOID:0000000006920609

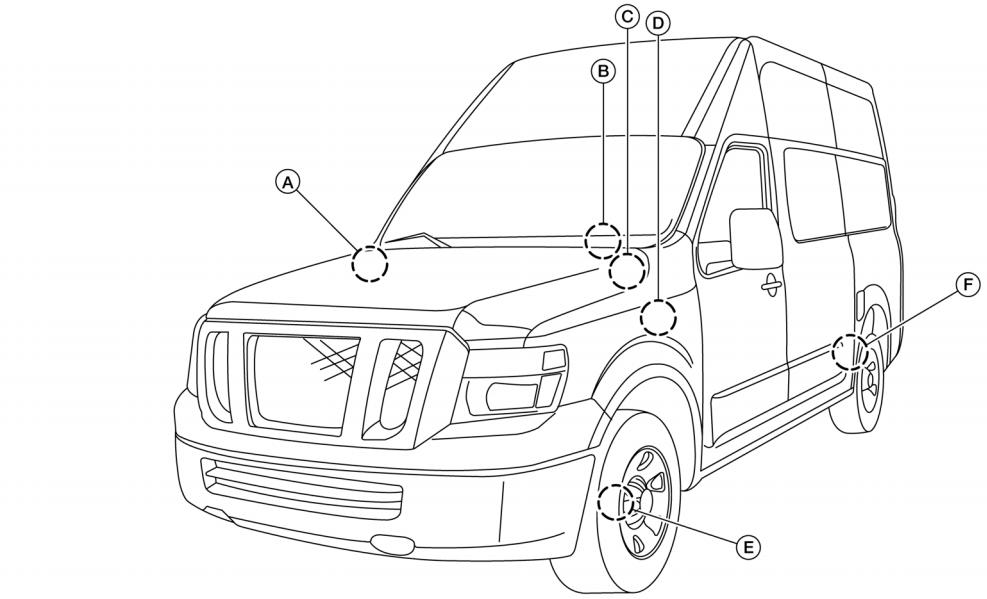
Tool name	Description
1. Flare nut crowfoot 2. Torque wrench  S-NT360	Removing and installing brake piping **a: 10 mm (0.39 in)/12 mm (0.47 in)**
Power tool  PIIB1407E	Loosening nuts, screws and bolts

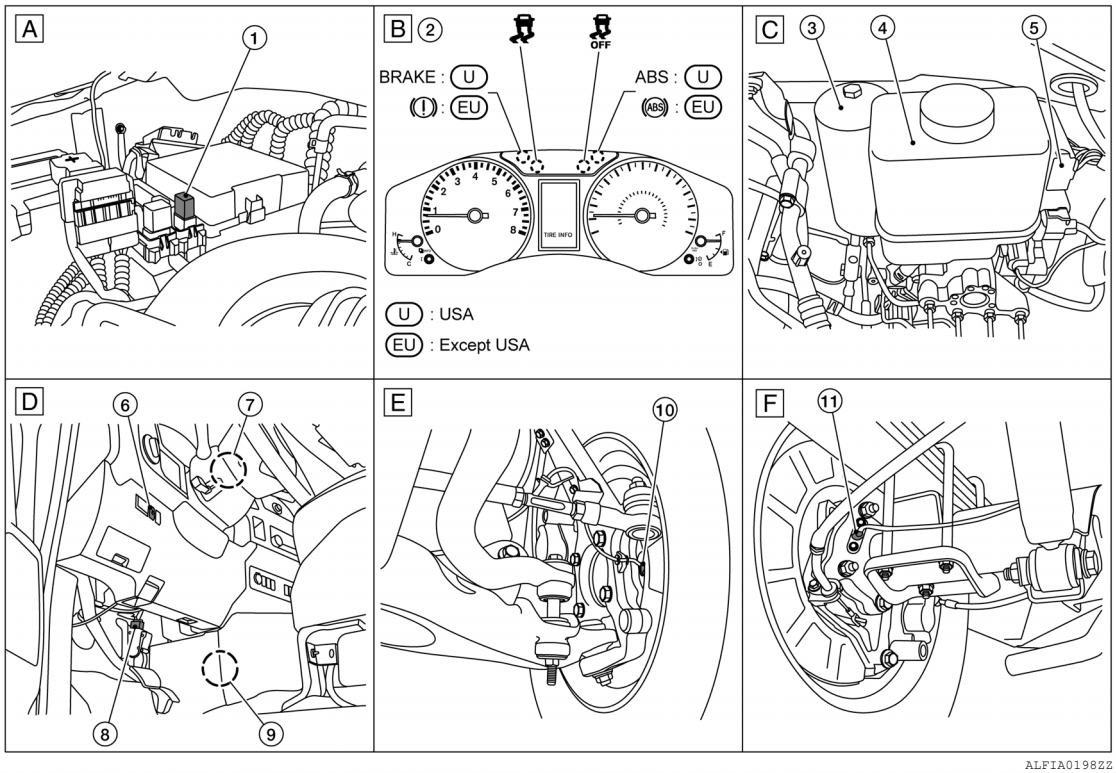
SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000006920610





ALFIA0198ZZ

1. Stop lamp relay
2. Combination meter
3. Accumulator
4. Brake fluid level switch (part of brake fluid reservoir)
5. ABS actuator and electric unit (control unit)
6. VDC OFF switch

7. Steering angle sensor 8. Stop lamp switch 9. Yaw rate/side/decel G sensor
10. Front wheel sensor 11. Rear wheel sensor

Component Description

INFOID:0000000006920611

Component		Reference/Function
ABS actuator and electric unit (control unit)	Motor/accumulator assembly	BRC-9, "ABS Actuator and Electric Unit (Control Unit)"
	Motor relay	
	Actuator relay (main relay)	
	ABS IN valve	
	ABS OUT valve	
	Cut valve 1	
	Cut valve 2	
	Suction valve 1	
	Suction valve 2	
	Accumulator pressure sensor	
	Master cylinder pressure sensor	
Wheel sensor		BRC-10, "Wheel Sensor and Sensor Rotor"
Stop lamp switch		BRC-10, "Stop Lamp Switch"
Steering angle sensor		BRC-10, "Steering Angle Sensor"
Yaw rate/side/decel G sensor		BRC-11, "Yaw Rate/Side/Decel G Sensor"
Brake fluid level switch		BRC-11, "Brake Fluid Level Switch"
Parking brake switch		BRC-11, "Parking Brake Switch"
VDC OFF switch		BRC-11, "VDC OFF Switch"
ECM		Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Target throttle position signal
TCM		Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Shift position signal • Current gear position signal
ABS warning lamp		BRC-12, "VDC/TCS/ABS : System Description"
Brake warning lamp		
VDC OFF indicator lamp		
SLIP indicator lamp		

ABS Actuator and Electric Unit (Control Unit)

INFOID:0000000006920612

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

Motor/Accumulator Assembly

Pump
• Operates the pump drive according to signals from ABS actuator and electric unit (control unit) by the motor.

Motor
• Operates the motor drive according to signals from ABS actuator and electric unit (control unit).

Accumulator
• The accumulator accumulates brake fluid conveyed by the motor and pump.

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

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

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

Cut Valve 1, Cut Valve 2
Shuts off the ordinary brake line from master cylinder to signals from ABS actuator and electric unit (control unit).

Suction Valve 1
Suction valve 1 switches the brake path to convey accumulator pressure to the front system, according to a signal transmitted from the ABS actuator and electric unit (control unit).

Suction Valve 2
Suction valve 2 releases accumulator pressure, according to a signal transmitted from the ABS actuator and electric unit (control unit).

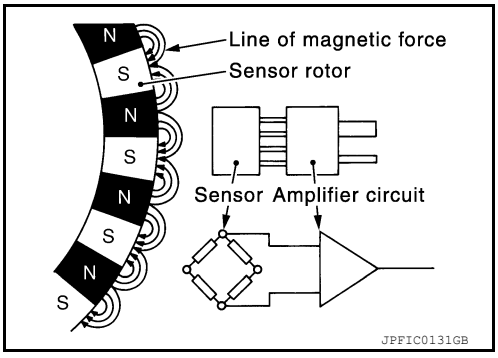
Accumulator Pressure Sensor
The accumulator pressure sensor detects brake fluid pressure accumulated in the accumulator and conveys the detected result to the ABS actuator and electric unit (control unit).

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

Wheel Sensor and Sensor Rotor

INFOID:0000000006920613

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



Stop Lamp Switch

INFOID:0000000006920614

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

Steering Angle Sensor

INFOID:0000000006920615

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:0000000006920616

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) / longitudinal acceleration (decel G signal)

Brake Fluid Level Switch

INFOID:0000000006920617

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

Parking Brake Switch

INFOID:0000000006920618

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

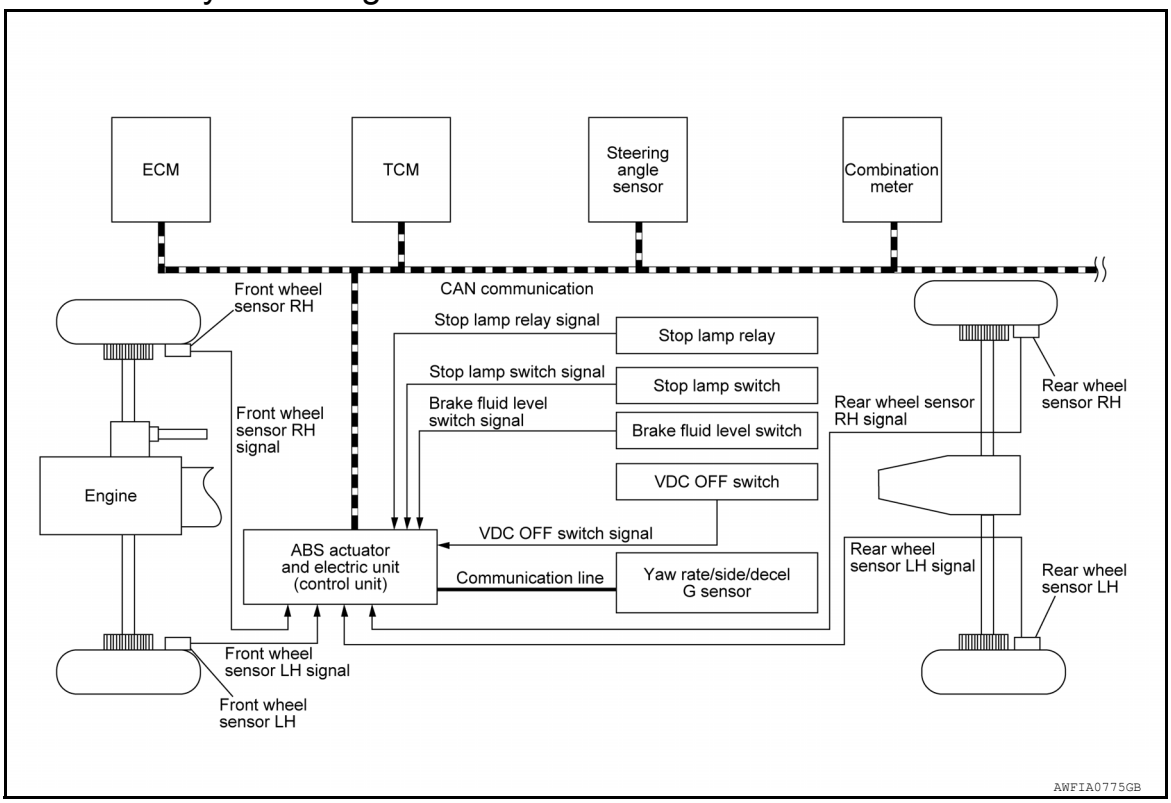
INFOID:0000000006920619

- The operation of the VDC OFF switch enables the arbitrary switching of the VDC function between stop status and standby status. The status of the function is indicated by the VDC OFF indicator lamp. (ON: Non-operational status, OFF: Standby status)
- VDC function
- TCS function
- VDC OFF indicator lamp turns OFF (standby status) when the engine is started again after it is stopped once while VDC OFF indicator lamp is ON (non-operational status).

SYSTEM
VDC/TCS/ABS

VDC/TCS/ABS : System Diagram

INFOID:0000000006951457



VDC/TCS/ABS : System Description

INFOID:0000000006920620

- 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 and EBD function.
- Fail-safe function is available for each function and is activated by each function when system malfunction occurs.

INPUT AND OUTPUT SIGNALS

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

Component	Signal description
Yaw rate/side/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line[*1]. • Yaw rate signal • Side G sensor signal • Decel G sensor signal
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Target throttle position signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Shift position signal • Current gear position signal

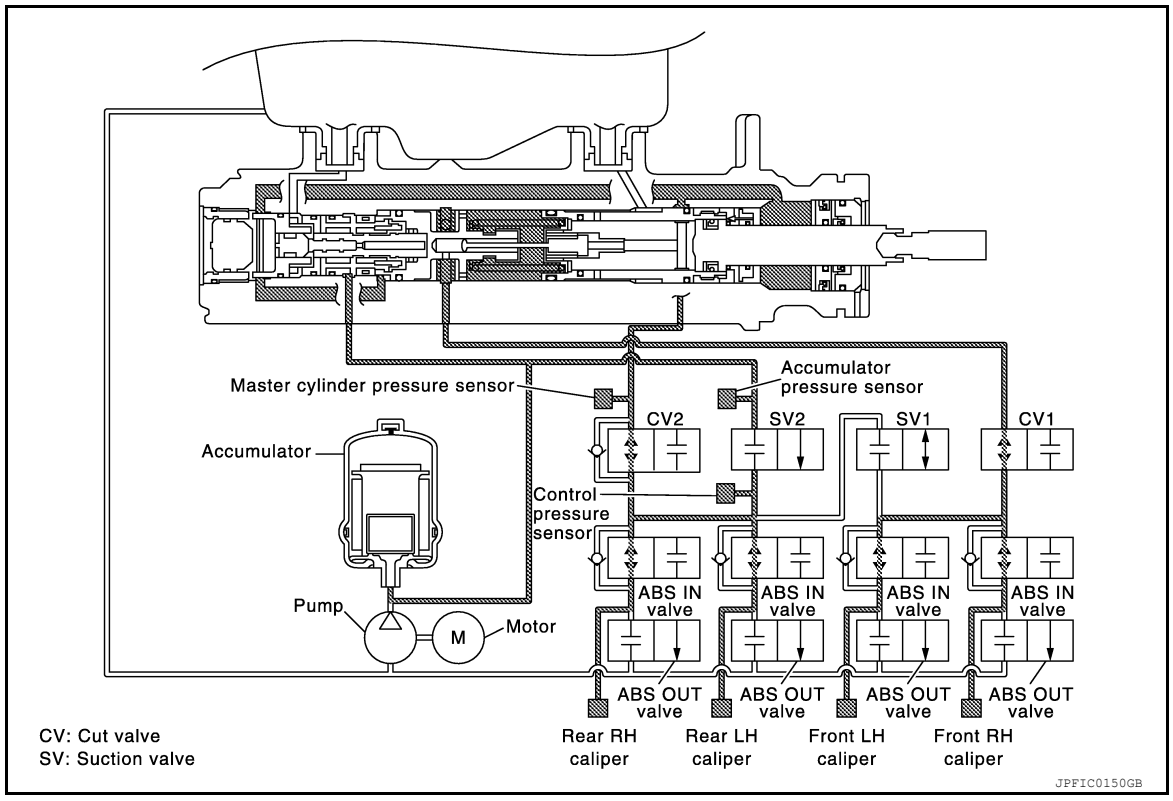
Component	Signal description
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • ABS warning lamp signal • Brake warning lamp signal • SLIP indicator lamp signal • VDC OFF indicator lamp

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

VALVE OPERATION

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

When Ordinary Brake Is Applied



Name	Not activated	When depressing brake pedal
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each caliper (fluid pressure)	—	Pressure increases

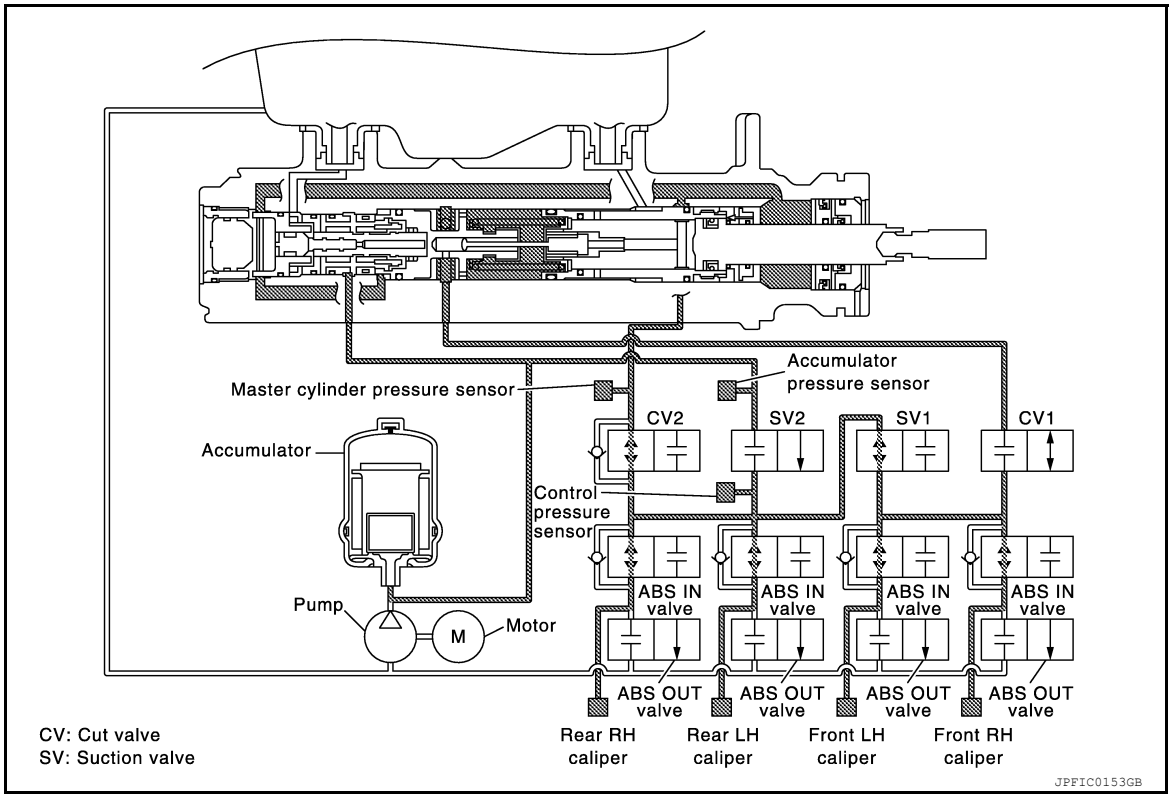
Front RH caliper
- Pressurized brake fluid from accumulator is supplied to front RH caliper through master cylinder part, cut valve 1 and ABS IN valve.

Front LH caliper
- Pressurized brake fluid from accumulator is supplied to front LH caliper through master cylinder part, cut valve 1 and ABS IN valve.

Rear RH caliper
• Pressurized brake fluid from accumulator is supplied to rear RH caliper through master cylinder part, cut valve 2 and ABS IN valve.

Rear LH caliper
• Pressurized brake fluid from accumulator is supplied to rear LH caliper through master cylinder part, cut valve 2 and ABS IN valve.

ABS Is Operating (When Pressure Increases)



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

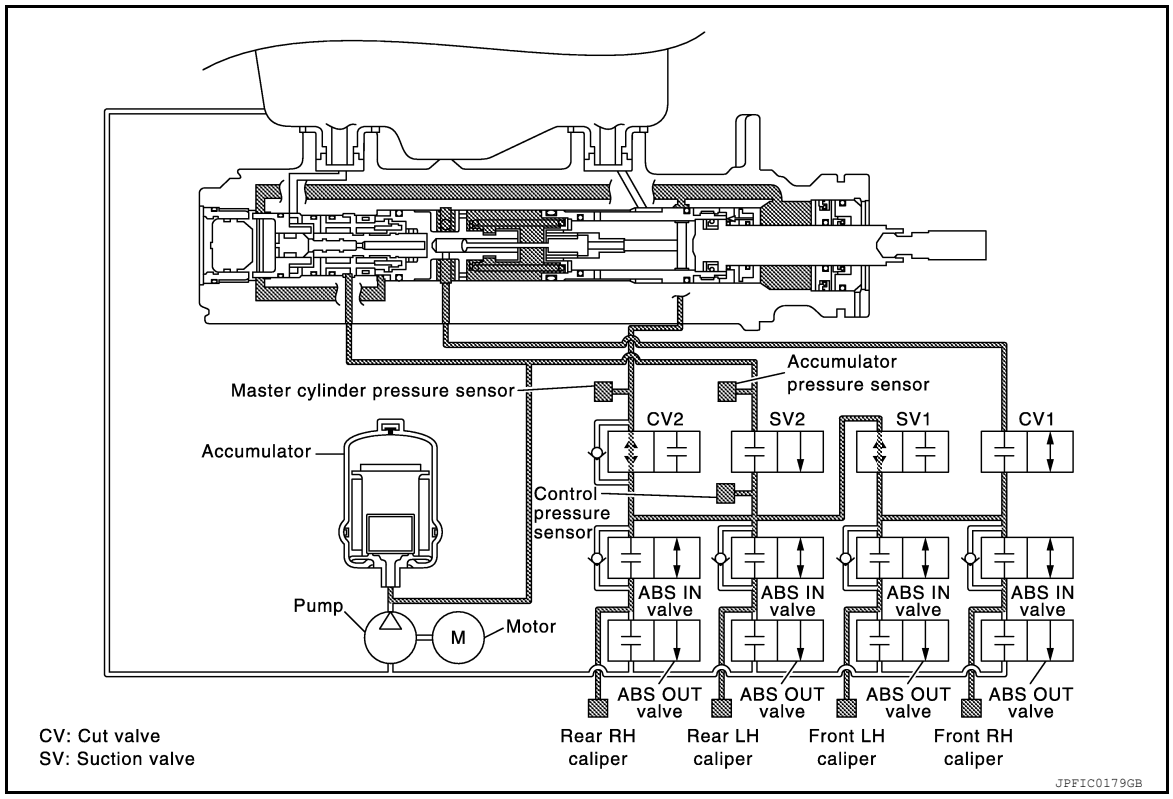
Front RH caliper
• Pressurized brake fluid from accumulator is supplied to front RH caliper through master cylinder part, cut valve 2, suction valve 1 and ABS IN valve.

Front LH caliper
• Pressurized brake fluid from accumulator is supplied to front LH caliper through master cylinder part, cut valve 2, suction valve 1 and ABS IN valve.

Rear RH caliper
• Pressurized brake fluid from accumulator is supplied to rear RH caliper through master cylinder part, cut valve 2 and ABS IN valve.

Rear LH caliper
• Pressurized brake fluid from accumulator is supplied to rear LH caliper through master cylinder part, cut valve 2 and ABS IN valve.

ABS Is Operating (When Pressure Holds)



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

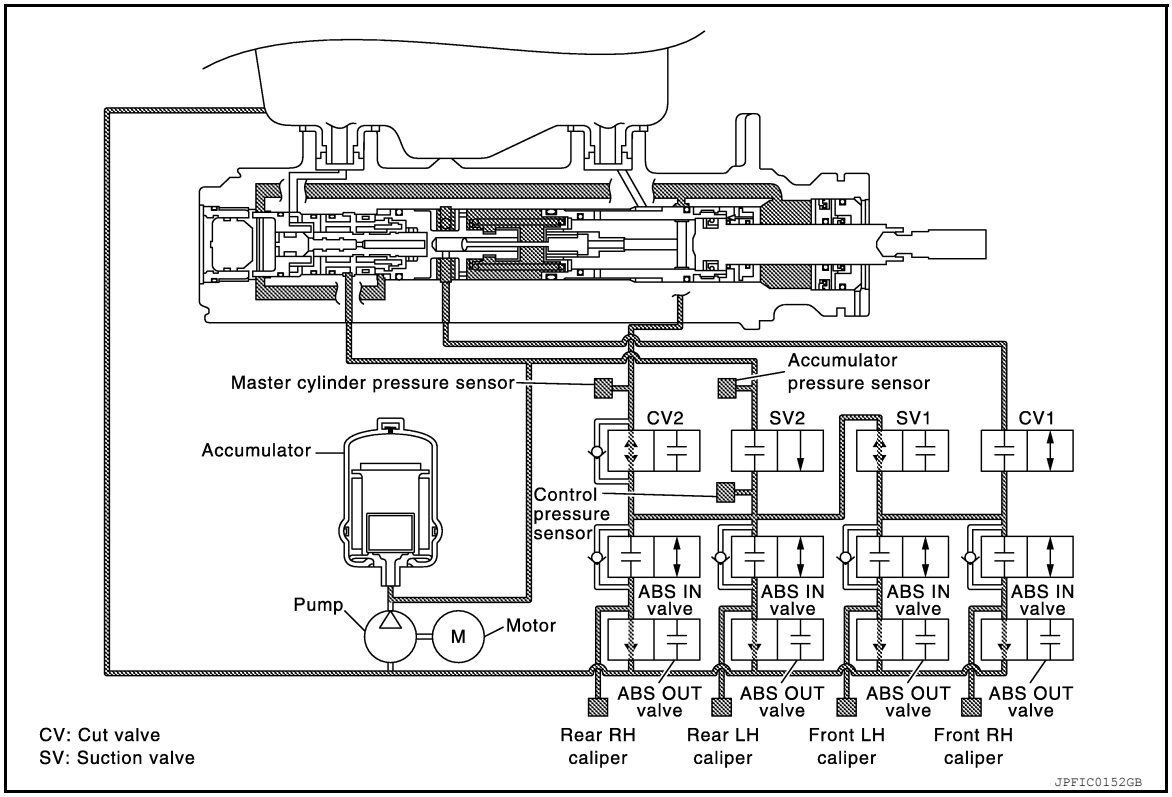
Front RH caliper
- ABS IN valve is close, fluid pressure of front RH caliper is holds.

Front LH caliper
- ABS IN valve is close, fluid pressure of front LH caliper is holds.

Rear RH caliper
- ABS IN valve is close and fluid pressure of rear RH caliper is holds.

Rear LH caliper
- ABS IN valve is close and fluid pressure of rear LH caliper is holds.

ABS Is Operating (When Pressure Decreases)



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

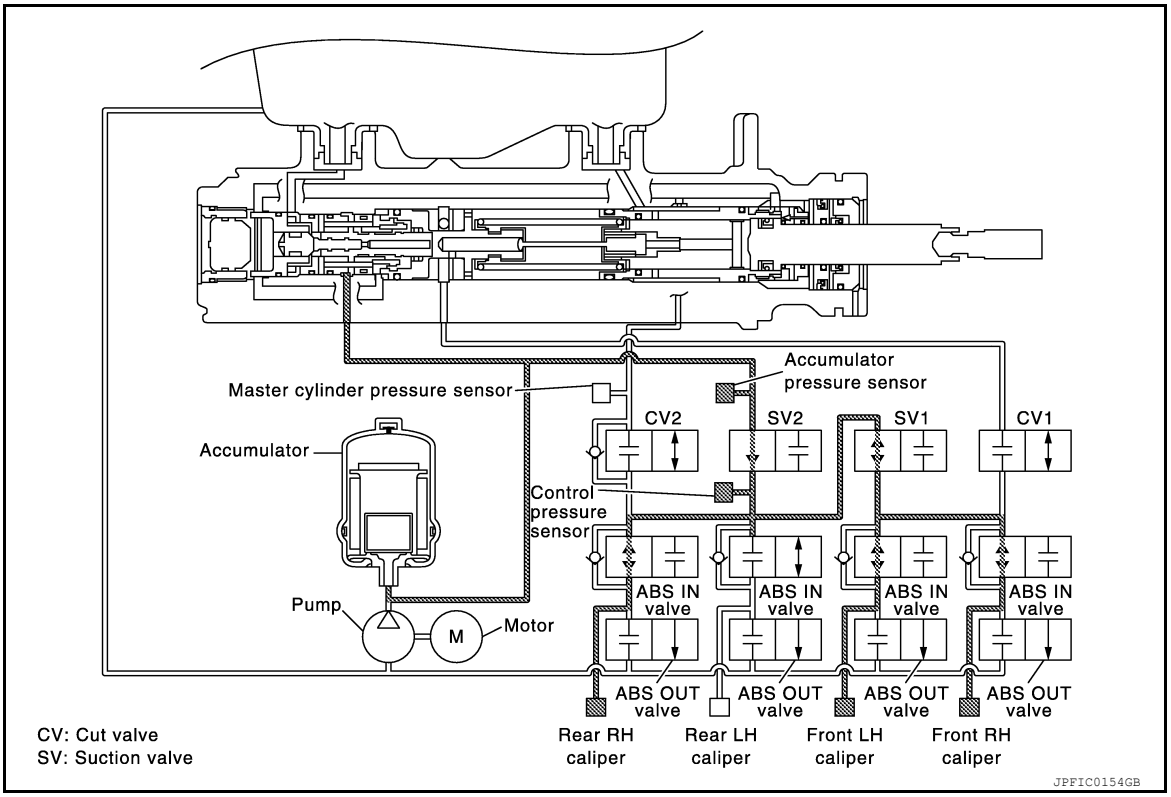
Front RH caliper
- Being returned to reservoir tank through ABS OUT valve, fluid pressure of front RH caliper is decreased.

Front LH caliper
- Being returned to reservoir tank through ABS OUT valve, fluid pressure of front LH caliper is decreased.

Rear RH caliper
- Being returned to reservoir tank through ABS OUT valve, fluid pressure of rear RH caliper is decreased.

Rear LH caliper
- Being returned to reservoir tank through ABS OUT valve, fluid pressure of rear LH caliper is decreased.

VDC Is Operating (When Pressure Increases)



Name	Not activated	When pressure increases
Cut valve 1	Power supply is not supplied (open)	Power supply is supplied (close)
Cut valve 2	Power supply is not supplied (open)	Power supply is supplied (close)
Suction valve 1	Power supply is not supplied (close)	Power supply is supplied (open)
Suction valve 2	Power supply is not supplied (close)	Power supply is supplied (open)
ABS IN valve	Power supply is not supplied (open)	Only in 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 (only in wheel that the pressure is to be increased)

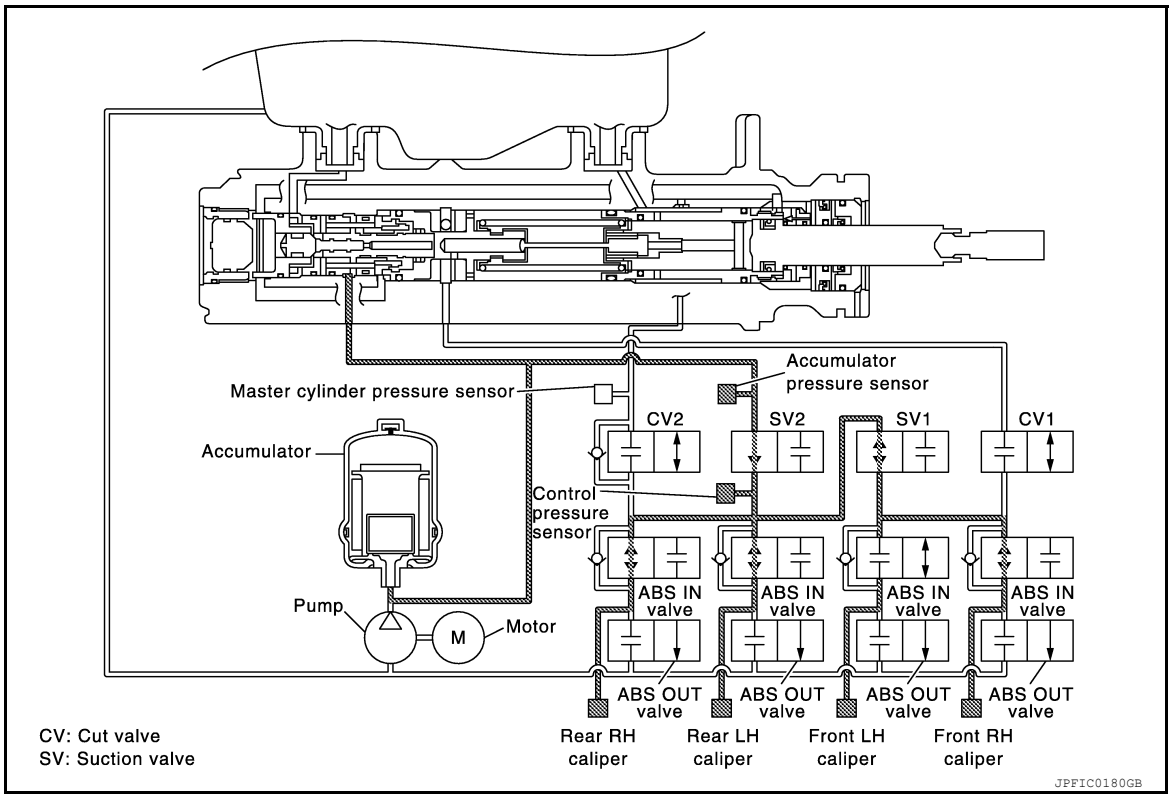
Front RH caliper
- Pressurized brake fluid from accumulator is supplied to front RH caliper through suction valve 2, suction valve 1 and ABS IN valve. When not increasing, ABS IN valve is closed and brake fluid is not supplied to front RH caliper.

Front LH caliper
- Pressurized brake fluid from accumulator is supplied to front LH caliper through suction valve 2, suction valve 1 and ABS IN valve. When not increasing, ABS IN valve is closed and brake fluid is not supplied to front LH caliper.

Rear RH caliper
- Pressurized brake fluid from accumulator is supplied to rear RH caliper through suction valve 2 and ABS IN valve. When not increasing, ABS IN valve is closed and brake fluid is not supplied to rear RH caliper.

Rear LH caliper
- Pressurized brake fluid from accumulator is supplied to rear LH caliper through suction valve 2 and ABS IN valve. When not increasing, ABS IN valve is closed and brake fluid is not supplied to rear LH caliper.

VDC Is Operating (When Pressure Holds)



Name	Not activated	When pressure holds
Cut valve 1	Power supply is not supplied (open)	Power supply is supplied (close)
Cut valve 2	Power supply is not supplied (open)	Power supply is supplied (close)
Suction valve 1	Power supply is not supplied (close)	Power supply is supplied (open)
Suction valve 2	Power supply is not supplied (close)	Power supply is supplied (open)
ABS IN valve	Power supply is not supplied (open)	Only wheel that the pressure is to be holds: Power supply is supplied (close) Wheel other than the one that the pressure is to be holds: 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 holds (only wheel that the pressure is to be holds)

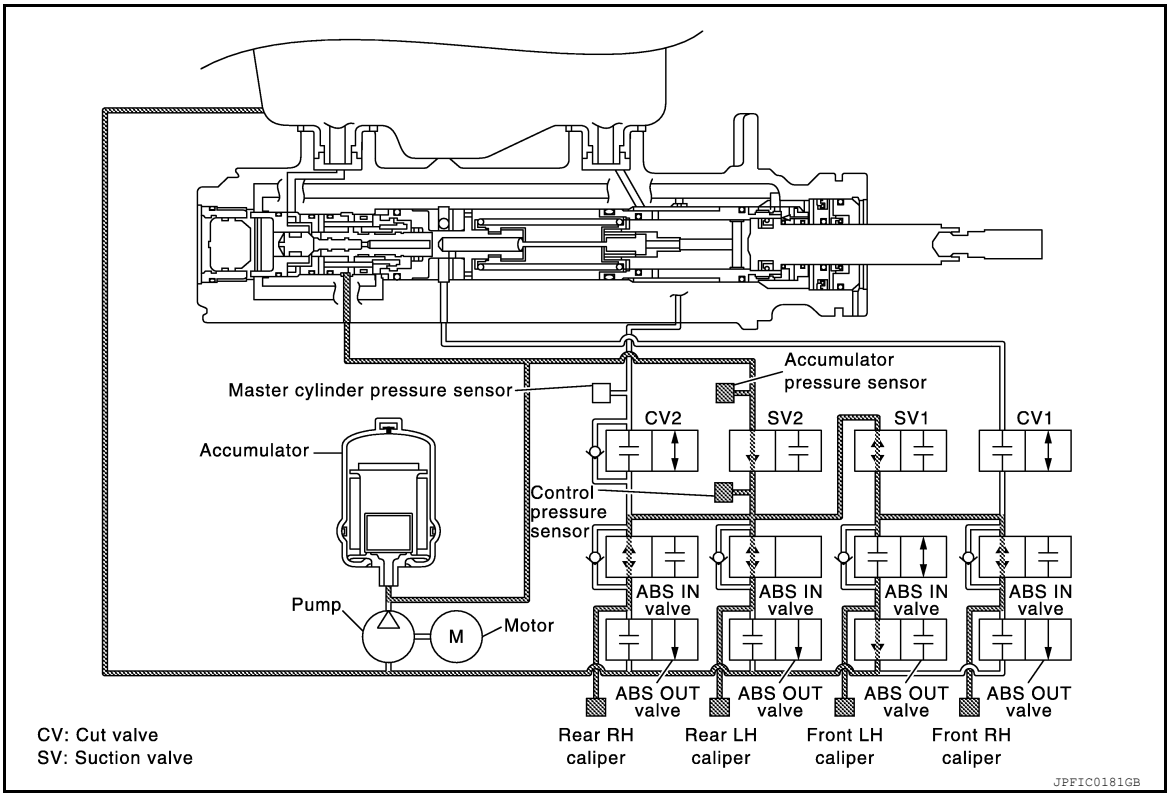
Front RH caliper
- ABS IN valve is close, fluid pressure of front RH caliper is holds.

Front LH caliper
- ABS IN valve is close, fluid pressure of front LH caliper is holds.

Rear RH caliper
- ABS IN valve is close, fluid pressure of rear RH caliper is holds.

Rear LH caliper
- ABS IN valve is close, fluid pressure of rear LH caliper is holds.

VDC Is Operating (When Pressure Decreases)



Name	Not activated	When pressure decreases
Cut valve 1	Power supply is not supplied (open)	Power supply is supplied (close)
Cut valve 2	Power supply is not supplied (open)	Power supply is supplied (close)
Suction valve 1	Power supply is not supplied (close)	Power supply is supplied (open)
Suction valve 2	Power supply is not supplied (close)	Power supply is supplied (open)
ABS IN valve	Power supply is not supplied (open)	Only in wheel that the pressure is to be decreased: Power supply is supplied (close) Wheel other than the one that the pressure is to be decreased: Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Only in wheel that the pressure is to be decreased: Power supply is supplied (open) Wheel other than the one that the pressure is to be decreased: Power supply is not supplied (close)
Each caliper (fluid pressure)	—	Pressure decreases (only in wheel that the pressure is to be decreased)

Front RH caliper
• Being returned to reservoir tank through ABS OUT valve, fluid pressure of front RH caliper is decreased.

Front LH caliper
• Being returned to reservoir tank through ABS OUT valve, fluid pressure of front LH caliper is decreased.

Rear RH caliper
• Being returned to reservoir tank through ABS OUT valve, fluid pressure of rear RH caliper is decreased.

Rear LH caliper
• Being returned to reservoir tank through ABS OUT valve, fluid pressure of rear LH caliper is decreased.

Component Parts and Function

Component	Function
Pump	Operates the pump drive according to signals from ABS actuator and electric unit (control unit) by the motor.
Motor	Operates the motor drive according to signals from ABS actuator and electric unit (control unit).
Accumulator	The accumulator accumulates brake fluid conveyed by the motor and pump.
ABS IN valve	Increases, holds or decreases the fluid pressure of each caliper according to signals from ABS actuator and electric unit (control unit).
ABS OUT valve	Increases, holds or decreases the fluid pressure of each caliper according to signals from ABS actuator and electric unit (control unit).
Cut valve 1 Cut valve 2	Shuts off the ordinary brake line from master cylinder to signals from ABS actuator and electric unit (control unit).
Suction valve 1	Suction valve 1 switches the brake line to convey accumulator pressure to the front system, according to a signal transmitted from the ABS actuator and electric unit (control unit).
Suction valve 2	Suction valve 2 releases accumulator pressure, according to a signal transmitted from the ABS actuator and electric unit (control unit).
Accumulator pressure sensor	The accumulator pressure sensor detects brake fluid pressure accumulated in the accumulator and conveys the detected result to the ABS actuator and electric unit (control unit).
Master cylinder pressure sensor	Detects the brake fluid pressure of master cylinder part and transmits a signal to ABS actuator and electric unit (control unit).

CONDITIONS FOR TURNING ON WARNING LAMPS

ABS Warning Lamp

- Turns ON at the same time as SLIP indicator 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. 2 seconds after the ignition switch is turned ON	ON
Approx. 2 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 SLIP indicator lamp when EBD function, motor/accumulator assembly or motor system is malfunctioning.
- Turns ON when ignition switch turns ON and turns OFF when the system is normal, for bulb check purposes.

Condition (status)	Brake warning lamp
Ignition switch OFF	OFF
For approx. 2 seconds after the ignition switch is turned ON	ON
Approx. 2 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 fluid is less than the specified level (brake fluid level switch ON)	ON
ABS function is malfunctioning	OFF
EBD function is malfunctioning	ON
Accumulator has low pressure	ON

Condition (status)	Brake warning lamp
Motor system is malfunctioning	ON
Ignition power supply system is malfunctioning	ON

CONDITIONS FOR TURNING ON 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. 2 seconds after the ignition switch is turned ON	ON
Approx. 2 seconds after ignition switch is turned ON (when the system is in normal operation)	OFF
When VDC OFF switch is ON (VDC function and TCS function are OFF)	ON

SLIP Indicator Lamp

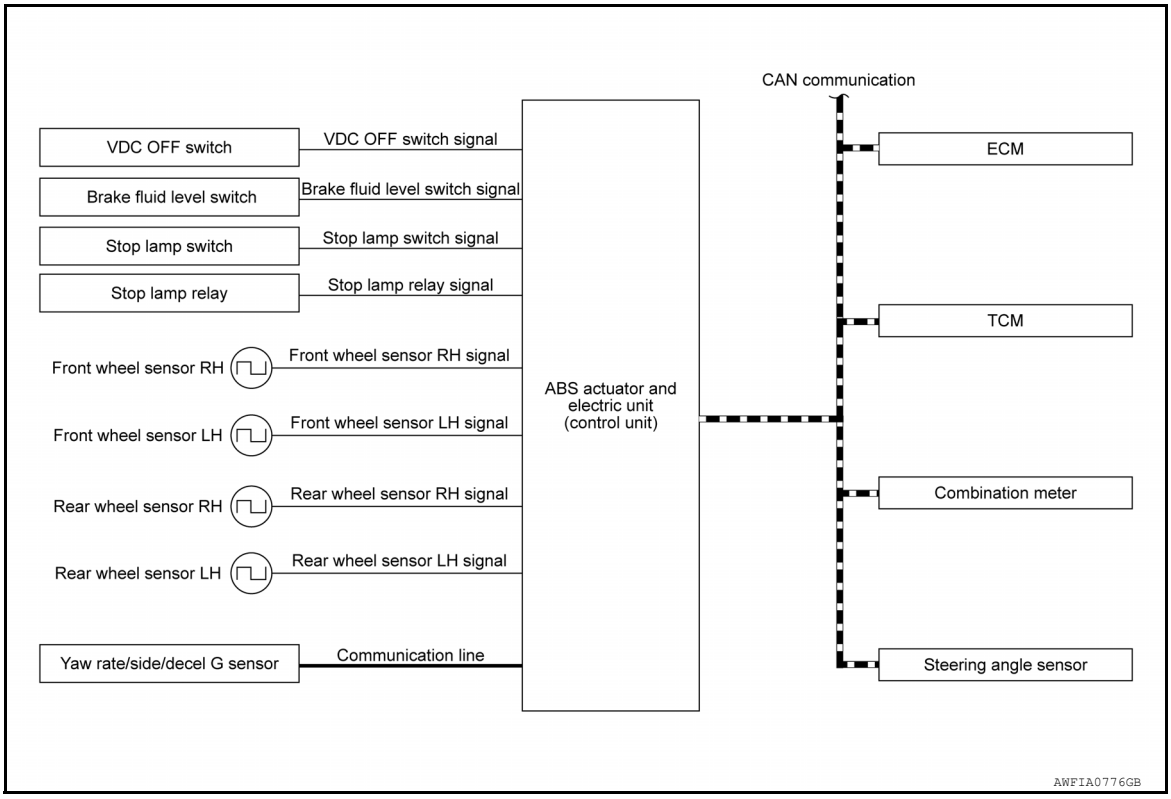
- Turns ON when either VDC function, TCS function, ABS function or EBD function is malfunctioning.
- Turns ON when ignition switch turns ON and turns OFF when the system is normal, for bulb check purposes.

Condition (status)	SLIP indicator lamp
Ignition switch OFF	OFF
For approx. 2 seconds after the ignition switch is turned ON	ON
Approx. 2 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

VDC/TCS/ABS : VDC Function

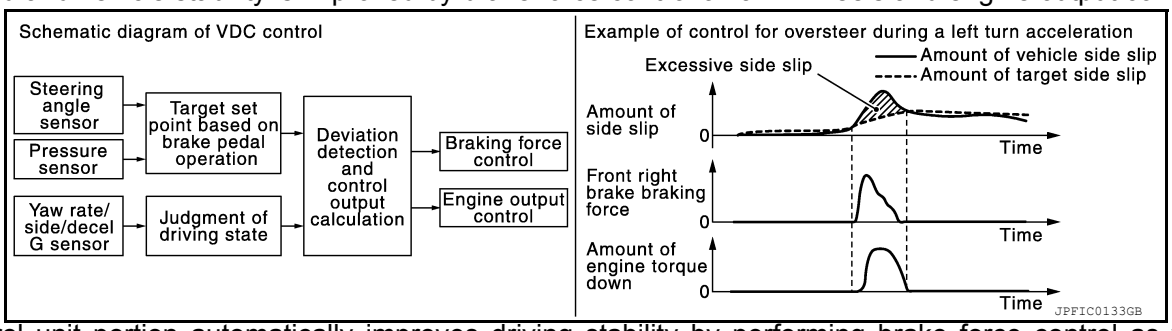
INFOID:0000000006920623

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

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



- 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 function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- SLIP indicator lamp is blinking while VDC function is in operation and indicates to the driver that the function is in operation.
- Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC function operates. This is not a malfunction because it is caused by VDC function that is normally operated.
- 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 and TCS function. The vehicle status becomes the same as models without VDC function and TCS function. However, ABS function and EBD function are operated normally. Refer to BRC-40, "Fail-safe".

INPUT AND OUTPUT SIGNALS

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

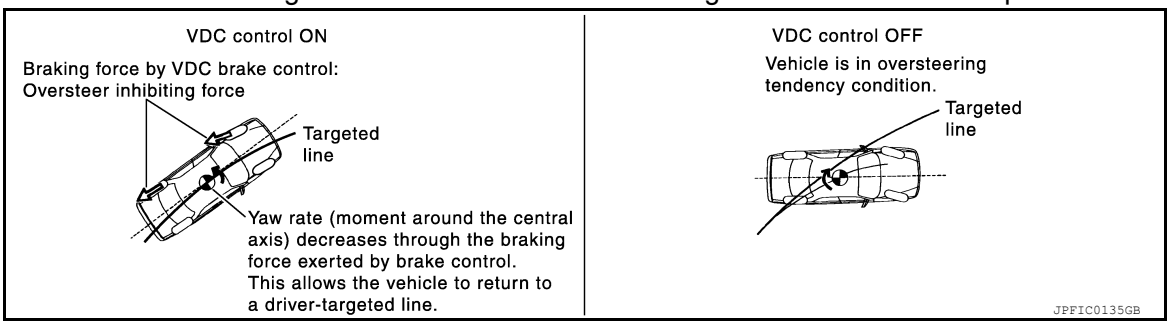
Component	Signal description
Yaw rate/side/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1. • Yaw rate signal • Side G sensor signal • Decel G sensor signal
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Target throttle position signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Shift position signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • SLIP indicator lamp signal • VDC OFF indicator lamp

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

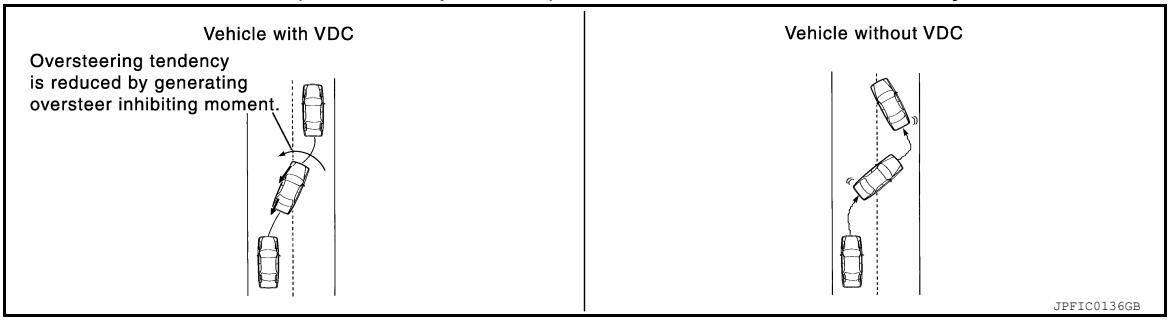
OPERATION CHARACTERISTICS

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.

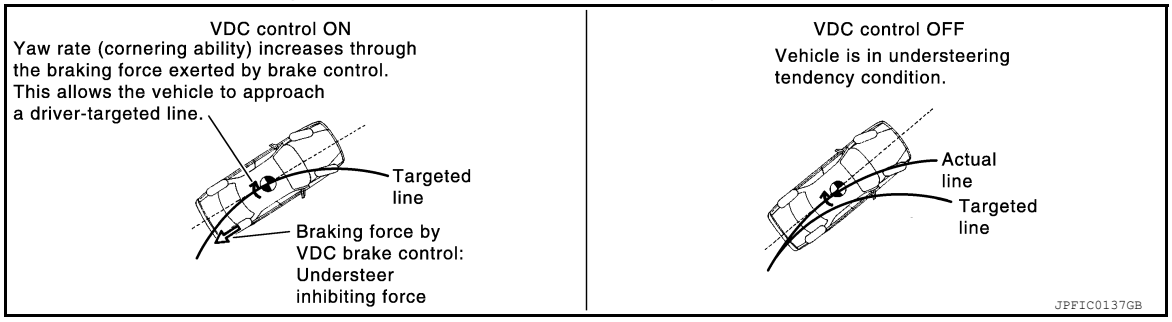


- Changing driving lane on a slippery road, when oversteer tendency is judged large, engine output is controlled as well as brake force (brake fluid pressure) of 4 wheels. Oversteer tendency decreases.

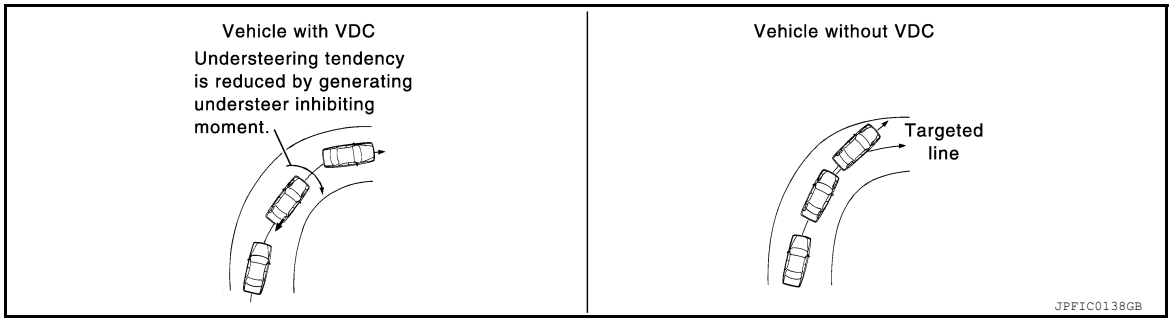


VDC Function That Prevents Understeer Tendency

- 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.



VDC/TCS/ABS : TCS Function

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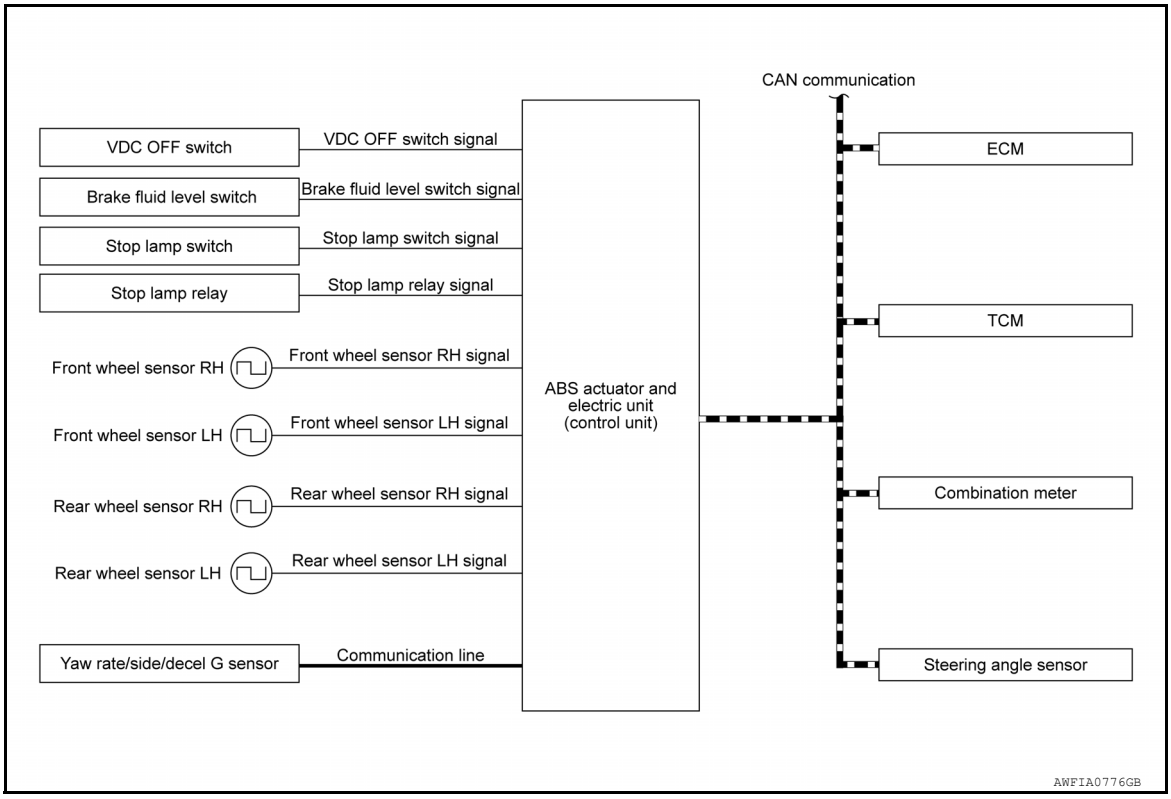
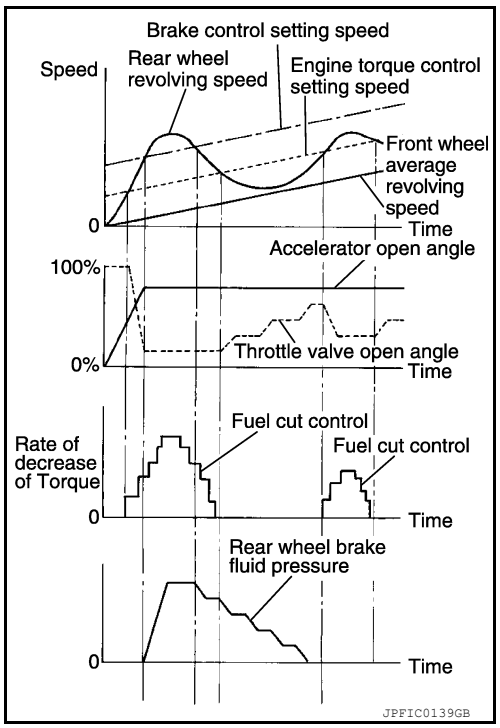
SYSTEM DIAGRAM



SYSTEM DESCRIPTION

- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Engine output and transmission shift status is controlled so that slip rate of drive wheels is in appropriate level. When wheel spin occurs on drive wheel, ABS actuator and electric unit (control unit) perform brake force control of LH and RH drive wheels (apply brake force by increasing brake fluid pressure of drive wheel) and decrease engine torque by engine torque control. Wheel spin amount decreases. Engine torque is controlled to appropriate level.
- TCS function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- SLIP indicator lamp is blinking while TCS function is in operation and indicates to the driver that the function is in operation.
- Slight vibrations are felt on the brake pedal and the operation noises occur, when TCS function operates. This is not a malfunction because it is caused by TCS function that is normally operated.
- 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 and TCS function. The vehicle status becomes the same as models without VDC function and TCS function. However, ABS function and EBD function are operated normally. Refer to BRC-40, "Fail-safe".



INPUT AND OUTPUT SIGNALS

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

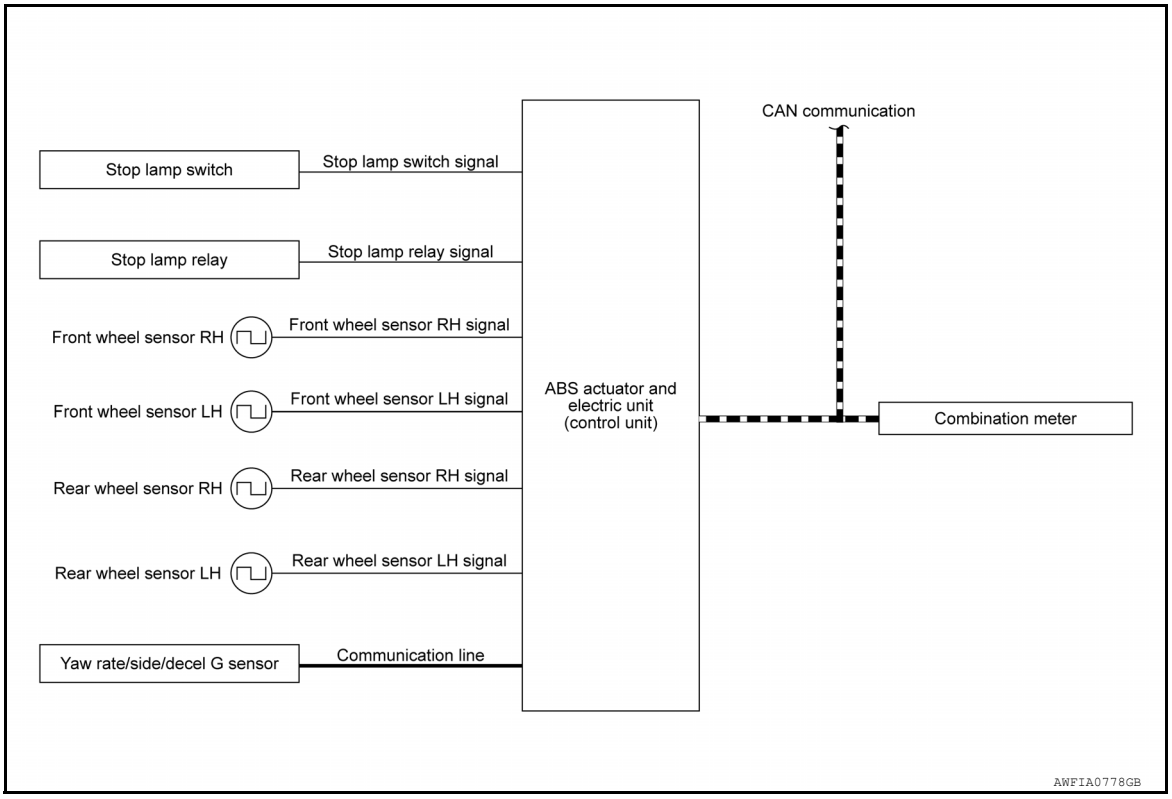
Component	Signal description
Yaw rate/side/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1. • Yaw rate signal • Side G sensor signal • Decel G sensor signal
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Target throttle position signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Shift position signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • SLIP indicator lamp signal • VDC OFF indicator lamp

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

VDC/TCS/ABS : ABS Function

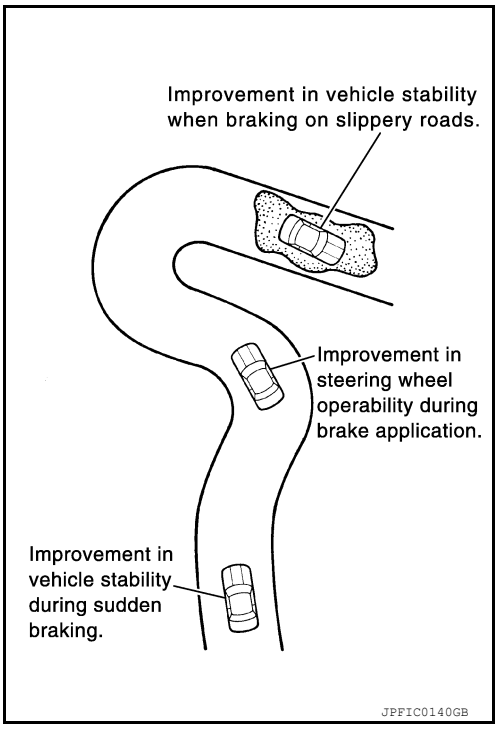
INFOID:0000000006920625

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

- By preventing wheel lock through brake force (brake fluid pressure) control that is electronically controlled by detecting wheel speed during braking, stability during emergency braking is improved so that obstacles can be easily bypassed by steering operation.
- During braking, control units calculate wheel speed and pseudo-vehicle speed, and transmits pressure increase, hold or decrease signals to actuator portion according to wheel slip status.
- The following effects are obtained by preventing wheel lock during braking.
- Vehicle tail slip is prevented during braking when driving straight.
- Understeer and oversteer tendencies are moderated during braking driving on a corner.
- Obstacles may be easily bypassed by steering operation during braking.
- Slight vibrations are felt on the brake pedal and the operation noises occur, when ABS function operates. This is not a malfunction because it is caused by ABS function that is normally operated.
- 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 and TCS function. The vehicle status becomes the same as models without VDC function, TCS function and ABS function. However, EBD function is operated normally. Refer to BRC-40, "Fail-safe".



NOTE:

- To stop vehicle efficiently, ABS does not operate and ordinary brake operates at low speed [approx. 5 to 10 km/h (3.1 to 6.2 MPH) or less, but differs subject to road conditions).
- Self-diagnosis is performed immediately after engine starts and when vehicle initially is driven [by vehicle speed approx. 15 km/h (9.3 MPH)]. Motor sounds are generated during self-diagnosis. In

addition, brake pedal may feel heavy when depressing brake pedal lightly. These symptoms are not malfunctions.

INPUT AND OUTPUT SIGNALS

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

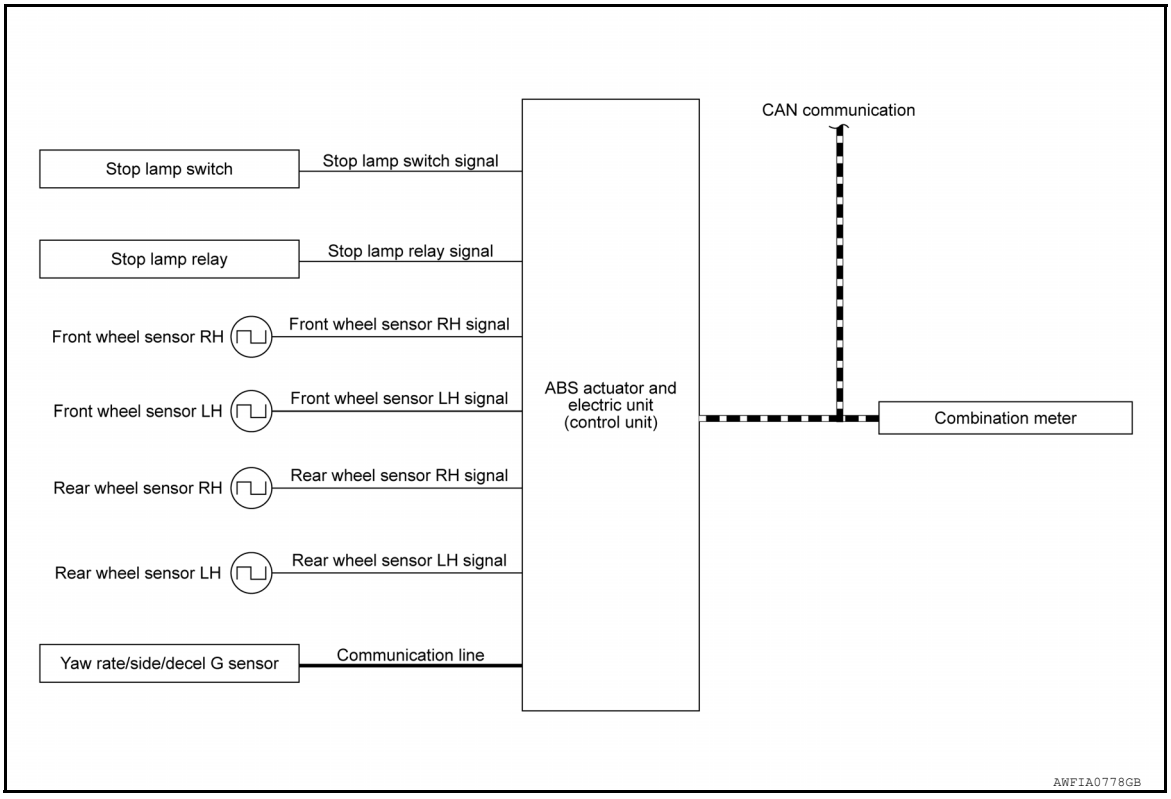
Component	Signal description
Yaw rate/side/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1. • Yaw rate signal • Side G sensor signal • Decel G sensor signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • ABS warning lamp signal

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

VDC/TCS/ABS : EBD Function

INFOID:0000000006920626

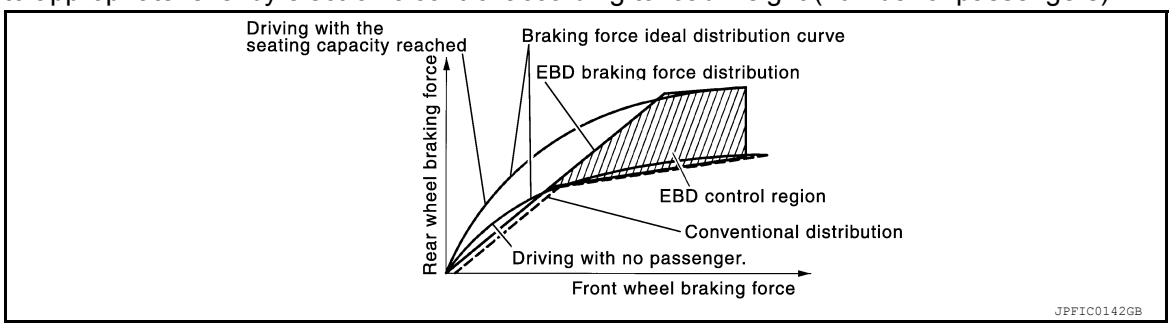
SYSTEM DIAGRAM



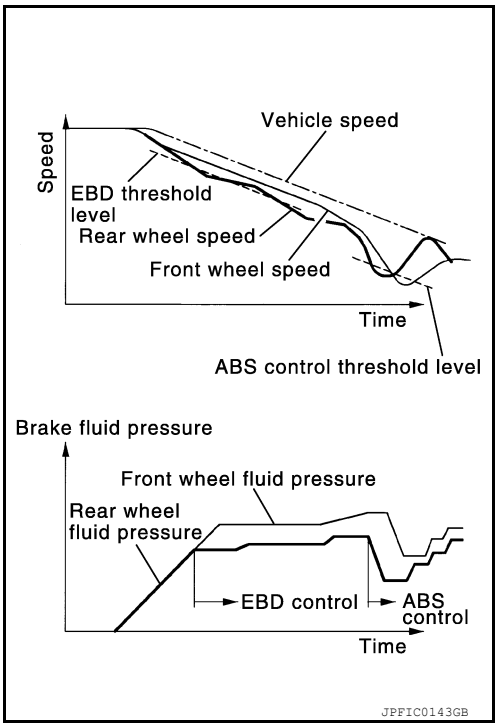
SYSTEM DESCRIPTION

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

- EBD function is expanded and developed from conventional ABS function and corrects rear wheel brake force to appropriate level by electronic control according to load weight (number of passengers).



- During braking, control unit portion compares slight slip on front and rear wheels by wheel speed sensor signal, transmits drive signal to actuator portion when rear wheel slip exceeds front wheel slip for the specified value or more, and controls rear wheel brake force (brake fluid pressure) so that increase of rear wheel slip is prevented and slips on front wheel and rear wheel are nearly equalized. ABS control is applied when slip on each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for VDC function, TCS function, ABS function and EBD function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and EBD function. Refer to BRC-40, "Fail-safe".



INPUT AND OUTPUT SIGNALS

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

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

VDC/TCS/ABS : Fail-safe

INFOID:0000000006951458

VDC AND TCS FUNCTION

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

ABS FUNCTION

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

NOTE:

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

EBD FUNCTION

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

DTC	Malfunction detected condition	Fail-safe condition
C1101	When an open circuit is detected in rear wheel sensor RH circuit.	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function (only when both rear wheels are malfunctioning)
C1102	When an open circuit is detected in rear wheel sensor LH circuit.	
C1103	When an open circuit is detected in front wheel sensor RH circuit.	
C1104	When an open circuit is detected in front wheel sensor LH circuit.	
C1105	• When power supply voltage of rear wheel sensor RH is low. • When distance between rear wheel sensor RH and rear wheel sensor RH rotor is large. • When installation of rear wheel sensor RH or rear wheel sensor RH rotor is not normal.	
C1106	• When power supply voltage of rear wheel sensor LH is low. • When distance between rear wheel sensor LH and rear wheel sensor LH rotor is large. • When installation of rear wheel sensor LH or rear wheel sensor LH rotor is not normal.	
C1107	• When power supply voltage of front wheel sensor RH is low. • When distance between front wheel sensor RH and front wheel sensor RH rotor is large. • When installation of front wheel sensor RH or front wheel sensor RH rotor is not normal.	
C1108	• When power supply voltage of front wheel sensor LH is low. • When distance between front wheel sensor LH and front wheel sensor LH rotor is large. • When installation of front wheel sensor LH or front wheel sensor LH rotor is not normal.	
C1109	• When ignition voltage is 10 V or less. • When ignition voltage is 16 V or more.	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function
C1111	• When a malfunction is detected in motor or motor relay. • When a low pressure malfunction is detected in accumulator. • When a malfunction is detected in accumulator pressure sensor.	
C1115	When difference in wheel speed between any wheel and others is detected while the vehicle is driven, because of installation of tires other than specified.	The following functions are suspended. • VDC function • TCS function • ABS function
C1116	• When stop lamp switch signal is not input when brake pedal is depressed. • When stop lamp switch signal is not input when stop lamp relay operates.	
C1120	When a malfunction is detected in front LH ABS IN valve.	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function
C1121	When a malfunction is detected in front LH ABS OUT valve.	
C1122	When a malfunction is detected in front RH ABS IN valve.	
C1123	When a malfunction is detected in front RH ABS OUT valve.	
C1124	When a malfunction is detected in rear LH ABS IN valve.	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	
C1126	When a malfunction is detected in rear RH ABS IN valve.	
C1127	When a malfunction is detected in rear RH ABS OUT valve.	
C1130	When a malfunction is detected in ECM system.	The following functions are suspended. • VDC function • TCS function

DTC	Malfunction detected condition	Fail-safe condition
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function
C1142	When a malfunction is detected in master cylinder pressure sensor.	The following functions are suspended. • VDC function • TCS 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. • When yaw rate signal is not continuously received for 2 seconds or more.	
	• When side G signal is not continuously received for 2 seconds or more. • When decel G signal is not continuously received for 2 seconds or more.	The following functions are suspended. • VDC function • TCS function • ABS function
C1146	When a malfunction is detected in side/decel G signal.	
C1155	• When brake fluid level low signal is detected. • When an open circuit is detected in brake fluid level switch circuit.	
C1160	When calibration of yaw rate/side/decel G sensor is not complete.	
C1164	When a malfunction is detected in cut valve 1.	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function
C1165	When a malfunction is detected in cut valve 2.	
C1166	When a malfunction is detected in suction valve 1.	
C1167	When a malfunction is detected in suction valve 2.	
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	The following functions are suspended. • VDC function • TCS function • ABS function
C118E	When performing excessive brake pedal operation with the vehicle stopped. [When accumulator fluid pressure reaches 11.43 MPa (114 bar, 116.6 kg/cm^2, 1657 psi) after reaching 17.3 MPa (173 bar, 176.5 kg/cm^2, 2509 psi.]	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function
U1000	When CAN communication signal is not continuously received for 2 seconds or more.	The following functions are suspended. • VDC function • TCS function • ABS function

PROTECTION FUNCTION

The SLIP indicator lamp, ABS warning lamp and brake warning lamp turns ON and DTC “C118E” may be detected in self-diagnosis result of “ABS” when the brake pedal is excessively operated, such as air bleeding. This is not a system malfunction because this occurs due to the temporary decrease in accumulator fluid pressure. The system returns to normal condition when the accumulator fluid pressure reaches the specified pressure with the ignition switch ON and the SLIP indicator lamp, ABS warning lamp, and brake warning lamp turned OFF. After these steps, erase self-diagnosis results for “ABS” with CONSULT.

DTC	• SLIP indicator lamp • ABS warning lamp • Brake warning lamp	Condition	Description protection function
C118E	ON	When temporary decrease in accumulator fluid pressure is detected. **NOTE:** System is not malfunctioning.	The following functions are suspended temporarily. • VDC function • TCS function • ABS function • EBD function

NOTE:
DTC “C1111” is detected in self-diagnosis results of “ABS” when the accumulator system has a malfunction.

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

CONSULT Function (ABS)

INFOID:0000000006920629

FUNCTION

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

Direct Diagnostic Mode	Description
Ecu Identification	The ABS actuator and electric unit (control unit) part number is displayed.
Self Diagnostic Result	The ABS actuator and electric unit (control unit) self diagnostic results are displayed.
Data Monitor	The ABS actuator and electric unit (control unit) input/output data is displayed in real time.
Active Test	The ABS actuator and electric unit (control unit) activates outputs to test components.
Function Test	This mode displays self diagnostic results of ABS system with either an “OK” or “NG”.
Work support	The settings for ABS actuator and electric unit (control unit) functions can be changed.
CAN Diag Support Monitor	The result of transmit/receive diagnosis of CAN communication is displayed.

ECU IDENTIFICATION

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

SELF DIAGNOSTIC RESULT

Operation Procedure

1. Before performing the self-diagnosis, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

How To Erase Self-diagnostic Result

1. After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn OFF.
   CAUTION:
   If memory cannot be erased, perform applicable diagnosis.
   NOTE:
   - When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
   - Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
   - VDC OFF switch should not stay in ON position.

Display Item List

Refer to BRC-44, "DTC Index".

DATA MONITOR

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

Item (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
RR RH SENSOR (km/h, mph)	×	×	×	Wheel speed (km/h, mph) calculated by rear wheel sensor RH signal is displayed.
DECEL G-SEN (G)	×	×	×	Longitudinal acceleration (G) detected by decel G-sensor is displayed.
FR RH IN SOL (On/Off)	–	×	×	Front RH IN ABS solenoid (On/Off) status is displayed.
FR RH OUT SOL (On/Off)	–	×	×	Front RH OUT ABS solenoid (On/Off) status is displayed.
FR LH IN SOL (On/Off)	–	×	×	Front LH IN ABS solenoid (On/Off) status is displayed.
FR LH OUT SOL (On/Off)	–	×	×	Front LH OUT ABS solenoid (On/Off) status is displayed.
RR RH IN SOL (On/Off)	–	×	×	Rear RH IN ABS solenoid (On/Off) status is displayed.
RR RH OUT SOL (On/Off)	–	×	×	Rear RH OUT ABS solenoid (On/Off) status is displayed.
RR LH IN SOL (On/Off)	–	×	×	Rear LH IN ABS solenoid (On/Off) status is displayed.
RR LH OUT SOL (On/Off)	–	×	×	Rear LH OUT ABS solenoid (On/Off) status is displayed.
EBD WARN LAMP (On/Off)	–	–	×	Brake warning lamp (On/Off) status is displayed.
STOP LAMP SW (On/Off)	×	×	×	Stop lamp switch (On/Off) status is displayed.
MOTOR RELAY (On/Off)	–	×	×	ABS motor relay signal (On/Off) status is displayed.
ACTUATOR RLY (On/Off)	–	×	×	ABS actuator relay signal (On/Off) status is displayed.
ABS WARN LAMP (On/Off)	–	×	×	ABS warning lamp (On/Off) status is displayed.
OFF LAMP (On/Off)	–	×	×	VDC OFF Lamp (On/Off) status is displayed.
OFF SW (On/Off)	×	×	×	VDC OFF switch (On/Off) status is displayed.
SLIP/VDC LAMP (On/Off)	–	×	×	SLIP indicator lamp (On/Off) status is displayed.
BATTERY VOLT (V)	×	×	×	Voltage (V) supplied to ABS actuator and electric unit (control unit) is displayed.
GEAR (1, 2, 3, 4, 5)	×	×	×	Gear position (1, 2, 3, 4, 5) judged by transmission range switch signal is displayed.
ENGINE SPEED (rpm)	×	×	×	Engine speed (rpm) judged by CAN communication signal is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate (d/s) detected by yaw rate sensor is displayed.
R POSI SIG (On/Off)	–	–	×	Reverse shift position (On/Off) judged by transmission range switch signal.
N POSI SIG (On/Off)	–	–	×	Shift position judged by transmission range switch signal.
CV1 (On/Off)	–	–	×	Front side switch-over solenoid valve (cut valve) (On/Off) status is displayed.

Item (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
CV2 (On/Off)	–	–	×	Rear side switch-over solenoid valve (cut-valve) (On/Off) status is displayed.
SV1 (On/Off)	–	–	×	Front side switch-over solenoid valve (suction valve) (On/Off) status is displayed.
SV2 (On/Off)	–	–	×	Rear side switch-over solenoid valve (suction valve) (On/Off) status is displayed.
STOP LAMP SW2 (On/Off)	×	×	×	Stop lamp switch (On/Off) status is displayed.
ACCEL POS SIG (%)	×	–	×	Throttle valve open/close status judged by CAN communication signal is displayed.
SIDE G-SENSOR (m/s^2)	×	–	×	Transverse acceleration detected by side G-sensor is displayed.
STR ANGLE SIG (deg)	×	–	×	Steering angle detected by steering angle sensor is displayed.
PRESS SENSOR (bar)	–	–	×	Brake pressure detected by pressure sensor is displayed.
ACCUM PRESS SEN (bar)	–	–	×	Accumulator pressure detected by accumulator pressure sensor is displayed.
EBD SIGNAL (On/Off)	–	–	×	EBD operation (On/Off) status is displayed.
ABS SIGNAL (On/Off)	–	–	×	ABS operation (On/Off) status is displayed.
TCS SIGNAL (On/Off)	–	–	×	TCS operation (On/Off) status is displayed.
VDC SIGNAL (On/Off)	–	–	×	VDC operation (On/Off) status is displayed.
EBD FAIL SIG (On/Off)	–	–	×	EBD fail signal (On/Off) status is displayed.
ABS FAIL SIG (On/Off)	–	–	×	ABS fail signal (On/Off) status is displayed.
TCS FAIL SIG (On/Off)	–	–	×	TCS fail signal (On/Off) status is displayed.
VDC FAIL SIG (On/Off)	–	–	×	VDC fail signal (On/Off) status is displayed.
CRANKING SIG (On/Off)	–	–	×	The input state of the key SW START position signal is displayed.
FLUID LEV SW (On/Off)	×	–	×	Brake fluid level switch (On/Off) status is displayed.
PARK BRAKE SW (On/Off)	–	–	×	Park brake switch (On/Off) status is displayed.
STP ON RLY (On/Off)	–	–	×	Stop lamp relay signal (On/Off) status is displayed.

×: Applicable

–: Not applicable

ACTIVE TEST

CAUTION:

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

- **ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp are on during active test.**

NOTE:
- When active test is performed while depressing the pedal, the pedal depression amount will change. This is normal. (Only solenoid valve and ABS motor.)
- "TEST IS STOPPED" is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" is displayed, to perform test again, touch BACK.

Test Item

SOLENOID VALVE
- When performing an active test of the ABS function, select "MAIN SIGNALS" for each test item.
- For ABS solenoid valve, touch "Up", "Keep", and "Down" on the display screen. For ABS solenoid valve (ACT), touch "Up", "ACT UP", "ACT KEEP" and confirm that solenoid valves operate as shown in the table below.

Operation		ABS solenoid valve			ABS solenoid valve (ACT)		
		Up	Keep	Down	Up	ACT UP	ACT KEEP
FR RH SOL	FR RH IN SOL	Off	On	On	—	—	—
	FR RH OUT SOL	Off	Off	On*	—	—	—
FR LH SOL	FR LH IN SOL	Off	On	On	—	—	—
	FR LH OUT SOL	Off	Off	On*	—	—	—
RR RH SOL	RR RH IN SOL	Off	On	On	—	—	—
	RR RH OUT SOL	Off	Off	On*	—	—	—
RR LH SOL	RR LH IN SOL	Off	On	On	—	—	—
	RR LH OUT SOL	Off	Off	On*	—	—	—
FR RH ABS SOLENOID (ACT)	FR RH IN SOL	—	—	—	Off	Off	Off
	FR RH OUT SOL	—	—	—	Off	Off	Off
	CV1	—	—	—	Off	On	On
	SV1	—	—	—	Off	On*	Off
FR LH ABS SOLENOID (ACT)	FR LH IN SOL	—	—	—	Off	Off	Off
	FR LH OUT SOL	—	—	—	Off	Off	Off
	CV1	—	—	—	Off	On	On
	SV1	—	—	—	Off	On*	Off
RR RH ABS SOLENOID (ACT)	RR RH IN SOL	—	—	—	Off	Off	Off
	RR RH OUT SOL	—	—	—	Off	Off	Off
	CV2	—	—	—	Off	On	On
	SV2	—	—	—	Off	On*	Off
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	—	—	—	Off	Off	Off
	RR LH OUT SOL	—	—	—	Off	Off	Off
	CV2	—	—	—	Off	On	On
	SV2	—	—	—	Off	On*	Off

*: On for 1 to 2 seconds after the touch, and then OFF

STOP LAMP ON RELAY
- Touch "On" and "Off" on screen. Make sure stop lamp on relay operates as shown in table below.

Operation	On	Off
STOP LAMP ON RELAY	On	Off

FUNCTION TEST

Self diagnostic results of the ABS system are displayed with an "OK" or "NG".

WORK SUPPORT

Conditions	Description
ST ANGLE SENSOR ADJUSTMENT	Steering angle sensor neutral position adjustment can be performed. Refer to BRC-55, "Description".
DECEL G SEN CALIBRATION	Decel G sensor calibration can be performed. Refer to BRC-57, "Description".

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000006920630

VALUES ON THE DIAGNOSIS TOOL

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FR LH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
FR RH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
RR LH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
RR RH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
DECEL G-SEN	Longitudinal acceleration detected by Decel G-Sensor	Vehicle stopped	Approx. 0 G
		Vehicle running	-1.7 to 1.7 G
FR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
RR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
EBD WARN LAMP	EBD warning lamp (Note 2)	When EBD warning lamp is ON	ON
		When EBD warning lamp is OFF	OFF
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is depressed	ON
		When brake pedal is released	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	ON
		When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp (Note 2)	When ABS warning lamp is ON	ON
		When ABS warning lamp is OFF	OFF
OFF LAMP	VDC OFF indicator lamp (Note 2)	When VDC OFF indicator lamp is ON	ON
		When VDC OFF indicator lamp is OFF	OFF
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON
		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF
SLIP/VDC LAMP	SLIP indicator lamp (Note 2)	When SLIP indicator lamp is ON	ON
		When SLIP indicator lamp is OFF	OFF
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5
ENGINE SPEED	With engine running	With engine stopped	0 rpm
		Engine running	Almost in accordance with tachometer display

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G sensor	When vehicle is stopped	Approx. 0 d/s
		When vehicle is turning	−75 to 75 d/s
R POSI SIG	Transmission range switch signal ON/OFF condition	A/T shift position = R position	ON
		A/T shift position = other than R position	OFF
N POSI SIG	Transmission range switch signal ON/OFF condition	A/T shift position = N position	ON
		A/T shift position = other than N position	OFF
CV1	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
CV2	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV1	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV2	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
STOP LAMP SW2	Stop lamp switch signal status	When brake pedal is depressed	ON
		When brake pedal is released	OFF
ACCEL POS SIG	Throttle actuator opening/closing is displayed (linked with accelerator pedal)	Accelerator pedal not depressed (ignition switch is ON)	0 %
		Accelerator pedal depressed (ignition switch is ON)	0 - 100 %
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle stopped	Approx. 0 m/s^2
		Vehicle turning right	Negative value (m/s^2)
		Vehicle turning left	Positive value (m/s^2)
STR ANGLE SIG	Steering angle detected by steering angle sensor	Straight-ahead	Approx. 0±2.5°
		Steering wheel turned	–720 to +720°
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	With ignition switch turned ON and brake pedal released	0 bar
		With ignition switch turned ON and brake pedal depressed	-40 to 300 bar

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
ACCUM PRESS SEN	Accumulator pressure	With ignition switch turned ON and brake pedal released	0 bar
		With ignition switch turned ON and brake pedal depressed	0 to 210 bar
EBD SIGNAL	EBD operation	EBD is active	ON
		EBD is inactive	OFF
ABS SIGNAL	ABS operation	ABS is active	ON
		ABS is inactive	OFF
TCS SIGNAL	TCS operation	TCS is active	ON
		TCS is inactive	OFF
VDC SIGNAL	VDC operation	VDC is active	ON
		VDC is inactive	OFF
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	ON
		EBD is normal	OFF
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	ON
		ABS is normal	OFF
TCS FAIL SIG	TCS fail-safe signal	In TCS fail-safe	ON
		TCS is normal	OFF
VDC FAIL SIG	VDC fail-safe signal	In VDC fail-safe	ON
		VDC is normal	OFF
CRANKING SIG	Crank operation	Crank is active	ON
		Crank is inactive	OFF
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch is ON	ON
		When brake fluid level switch is OFF	OFF
PARK BRAKE SW	Parking brake switch signal status	Parking brake applied	ON
		Parking brake released	OFF
STP ON RLY	Stop lamp relay signal	When stop lamp relay is ON	ON
		When stop lamp relay is OFF	OFF

NOTE:

- 1: Confirm tire pressure is normal.
- 2: ON and OFF timing for warning lamp and indicator lamp.

- ABS warning lamp: Refer to BRC-101, "Component Function Check".
- Brake warning lamp: Refer to BRC-102, "Component Function Check".
- SLIP indicator lamp: Refer to BRC-104, "Component Function Check".
- VDC OFF indicator lamp: Refer to BRC-103, "Component Function Check".

Fail-safe

INFOID:0000000006920621

VDC AND TCS FUNCTION

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

ABS FUNCTION

ABS warning lamp and SLIP indicator lamp in combination meter turn ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function

and ABS function. The vehicle status becomes the same as models without VDC function, TCS function and ABS function. However, EBD function is operated normally.

NOTE:

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

EBD FUNCTION

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

DTC	Malfunction detected condition	Fail-safe condition
C1101	When an open circuit is detected in rear wheel sensor RH circuit.	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function (only when both rear wheels are malfunctioning)
C1102	When an open circuit is detected in rear wheel sensor LH circuit.	
C1103	When an open circuit is detected in front wheel sensor RH circuit.	
C1104	When an open circuit is detected in front wheel sensor LH circuit.	
C1105	• When power supply voltage of rear wheel sensor RH is low. • When distance between rear wheel sensor RH and rear wheel sensor RH rotor is large. • When installation of rear wheel sensor RH or rear wheel sensor RH rotor is not normal.	
C1106	• When power supply voltage of rear wheel sensor LH is low. • When distance between rear wheel sensor LH and rear wheel sensor LH rotor is large. • When installation of rear wheel sensor LH or rear wheel sensor LH rotor is not normal.	
C1107	• When power supply voltage of front wheel sensor RH is low. • When distance between front wheel sensor RH and front wheel sensor RH rotor is large. • When installation of front wheel sensor RH or front wheel sensor RH rotor is not normal.	
C1108	• When power supply voltage of front wheel sensor LH is low. • When distance between front wheel sensor LH and front wheel sensor LH rotor is large. • When installation of front wheel sensor LH or front wheel sensor LH rotor is not normal.	
C1109	• When ignition voltage is 10 V or less. • When ignition voltage is 16 V or more.	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function
C1111	• When a malfunction is detected in motor or motor relay. • When a low pressure malfunction is detected in accumulator. • When a malfunction is detected in accumulator pressure sensor.	
C1115	When difference in wheel speed between any wheel and others is detected while the vehicle is driven, because of installation of tires other than specified.	The following functions are suspended. • VDC function • TCS function • ABS function
C1116	• When stop lamp switch signal is not input when brake pedal is depressed. • When stop lamp switch signal is not input when stop lamp relay operates.	
C1120	When a malfunction is detected in front LH ABS IN valve.	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function
C1121	When a malfunction is detected in front LH ABS OUT valve.	
C1122	When a malfunction is detected in front RH ABS IN valve.	
C1123	When a malfunction is detected in front RH ABS OUT valve.	
C1124	When a malfunction is detected in rear LH ABS IN valve.	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	
C1126	When a malfunction is detected in rear RH ABS IN valve.	
C1127	When a malfunction is detected in rear RH ABS OUT valve.	

DTC	Malfunction detected condition	Fail-safe condition
C1130	When a malfunction is detected in ECM system.	The following functions are suspended. • VDC function • TCS function
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function
C1142	When a malfunction is detected in master cylinder pressure sensor.	The following functions are suspended. • VDC function • TCS 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. • When yaw rate signal is not continuously received for 2 seconds or more.	
	• When side G signal is not continuously received for 2 seconds or more. • When decel G signal is not continuously received for 2 seconds or more.	The following functions are suspended. • VDC function • TCS function • ABS function
C1146	When a malfunction is detected in side/decel G signal.	
C1155	• When brake fluid level low signal is detected. • When an open circuit is detected in brake fluid level switch circuit.	
C1160	When calibration of yaw rate/side/decel G sensor is not complete.	
C1164	When a malfunction is detected in cut valve 1.	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function
C1165	When a malfunction is detected in cut valve 2.	
C1166	When a malfunction is detected in suction valve 1.	
C1167	When a malfunction is detected in suction valve 2.	
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	The following functions are suspended. • VDC function • TCS function • ABS function
C118E	When performing excessive brake pedal operation with the vehicle stopped. [When accumulator fluid pressure reaches 11.43 MPa (114 bar, 116.6 kg/cm^2, 1657 psi) after reaching 17.3 MPa (173 bar, 176.5 kg/cm^2, 2509 psi.]	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function
U1000	When CAN communication signal is not continuously received for 2 seconds or more.	The following functions are suspended. • VDC function • TCS function • ABS function

PROTECTION FUNCTION

The SLIP indicator lamp, ABS warning lamp and brake warning lamp turns ON and DTC “C118E” may be detected in self-diagnosis result of “ABS” when the brake pedal is excessively operated, such as air bleeding. This is not a system malfunction because this occurs due to the temporary decrease in accumulator fluid pressure. The system returns to normal condition when the accumulator fluid pressure reaches the specified pressure with the ignition switch ON and the SLIP indicator lamp, ABS warning lamp, and brake warning lamp turned OFF. After these steps, erase self-diagnosis results for “ABS” with CONSULT.

DTC	• SLIP indicator lamp • ABS warning lamp • Brake warning lamp	Condition	Description protection function
C118E	ON	When temporary decrease in accumulator fluid pressure is detected. **NOTE:** System is not malfunctioning.	The following functions are suspended temporarily. • VDC function • TCS function • ABS function • EBD function

NOTE:
DTC “C1111” is detected in self-diagnosis results of “ABS” when the accumulator system has a malfunction.

DTC Inspection Priority Chart

INFOID:0000000006920633

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

Priority	Detected item (DTC)
1	• U1000 CAN COMM CIRCUIT
2	• C1170 VARIANT CODING
3	• C1130 ENGINE SIGNAL 1 • C1144 ST ANG SEN SIGNAL
4	• C1109 BATTERY VOLTAGE [ABNORMAL] • C1111 PUMP MOTOR • C1140 ACTUATOR RLY
5	• C1101 RR RH SENSOR-1 • C1102 RR LH SENSOR-1 • C1103 FR RH SENSOR-1 • C1104 FR LH SENSOR-1 • C1105 RR RH SENSOR-2 • C1106 RR LH SENSOR-2 • C1107 FR RH SENSOR-2 • C1108 FR LH SENSOR-2 • C1115 ABS SENSOR [ABNORMAL SIGNAL] • C1116 STOP LAMP SW • C1120 FR LH IN ABS SOL • C1121 FR LH OUT ABS SOL • C1122 FR RH IN ABS SOL • C1123 FR RH OUT ABS SOL • C1124 RR LH IN ABS SOL • C1125 RR LH OUT ABS SOL • C1126 RR RH IN ABS SOL • C1127 RR RH OUT ABS SOL • C1142 PRESS SEN CIRCUIT • C1143 ST ANG SEN CIRCUIT • C1145 YAW RATE SENSOR • C1146 SIDE G-SEN CIRCUIT • C1160 DECEL G SEN SET • C1164 CV 1 • C1165 CV 2 • C1166 SV 1 • C1167 SV 2
6	• C1155 BR FLUID LEVEL LOW • C118E ACCUMULATOR PRESS

DTC Index

INFOID:0000000006920634

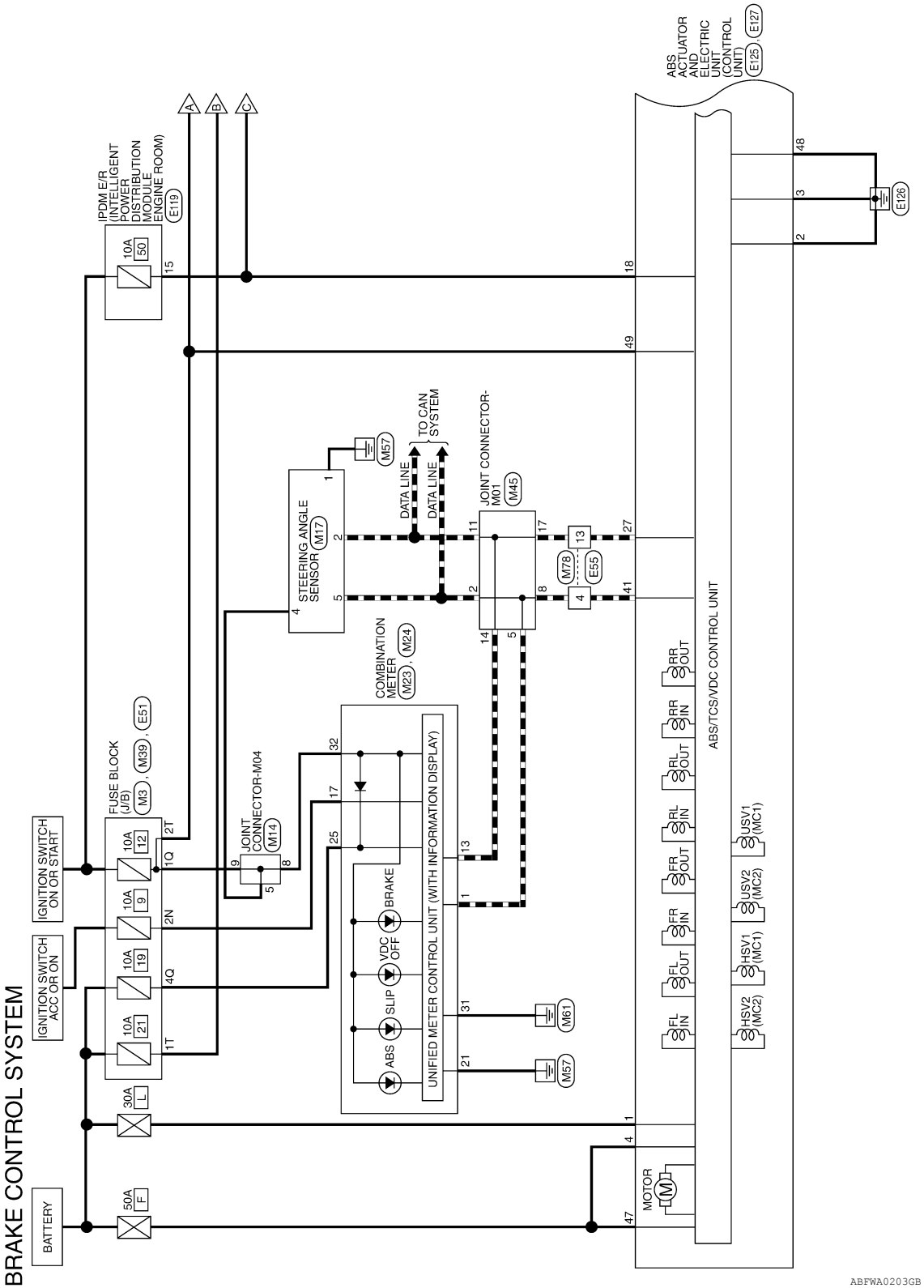
DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	BRC-59, "DTC Logic"
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	BRC-61, "DTC Logic"
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-63, "DTC Logic"
C1111	PUMP MOTOR	BRC-65, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-67, "DTC Logic"
C1116	STOP LAMP SW	BRC-69, "DTC Logic"
C1120	FR LH IN ABS SOL	BRC-74, "DTC Logic"
C1121	FR LH OUT ABS SOL	BRC-76, "DTC Logic"
C1122	FR RH IN ABS SOL	BRC-74, "DTC Logic"
C1123	FR RH OUT ABS SOL	BRC-76, "DTC Logic"
C1124	RR LH IN ABS SOL	BRC-74, "DTC Logic"
C1125	RR LH OUT ABS SOL	BRC-76, "DTC Logic"
C1126	RR RH IN ABS SOL	BRC-74, "DTC Logic"
C1127	RR RH OUT ABS SOL	BRC-76, "DTC Logic"
C1130	ENGINE SIGNAL 1	BRC-78, "DTC Logic"
C1140	ACTUATOR RLY	BRC-79, "DTC Logic"
C1142	PRESS SEN CIRCUIT	BRC-81, "DTC Logic"
C1143	ST ANG SEN CIRCUIT	BRC-83, "DTC Logic"
C1144	ST ANG SEN SIGNAL	BRC-85, "DTC Logic"
C1145	YAW RATE SENSOR	BRC-86, "DTC Logic"
C1146	SIDE G-SEN CIRCUIT	
C1155	BR FLUID LEVEL LOW	BRC-89, "DTC Logic"
C1160	DECEL G SEN SET	BRC-91, "DTC Logic"
C1164	CV 1	BRC-92, "DTC Logic"
C1165	CV 2	
C1166	SV 1	
C1167	SV 2	
C1170	VARIANT CODING	BRC-94, "DTC Logic"
C118E	ACCUMULATOR PRESS	BRC-95, "DTC Logic"
U1000	CAN COMM CIRCUIT	BRC-96, "DTC Logic"

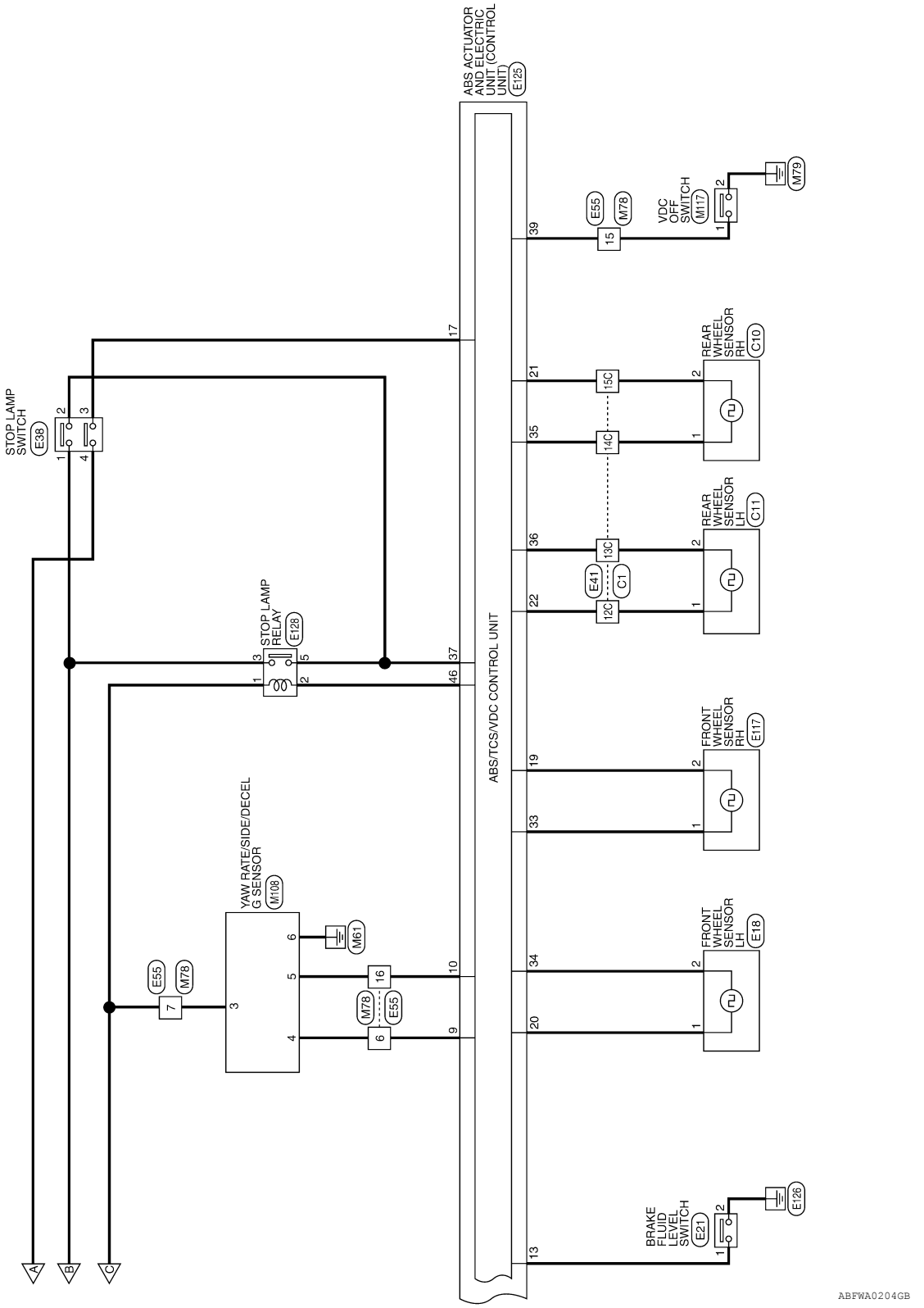
WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:0000000006920635

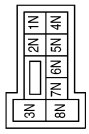



ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) E125
ABS/TCS/VDC CONTROL UNIT
VDC OFF SWITCH M117
M79
E55
M78
15
39
STOP LAMP SWITCH E38
STOP LAMP RELAY E128
17
37
46
REAR WHEEL SENSOR RH C10
REAR WHEEL SENSOR LH C11
15C
14C
13C
12C
E41
C1
21
35
36
22
FRONT WHEEL SENSOR RH E117
FRONT WHEEL SENSOR LH E18
19
33
34
20
YAW RATE/SIDE/DECEL G SENSOR M108
M61
7
16
6
10
9
BRAKE FLUID LEVEL SWITCH E21
E126
13
A
B
C
ABFWA0204GB

BRAKE CONTROL SYSTEM CONNECTORS

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

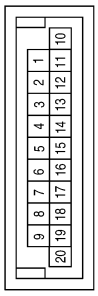
H.S.



Terminal No.	Color of Wire	Signal Name
2N	O	–

Connector No.	M14
Connector Name	JOINT CONNECTOR-M04
Connector Color	BLUE

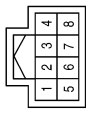
H.S.



Terminal No.	Color of Wire	Signal Name
5	R	–
8	R	–
9	R	–

Connector No.	M17
Connector Name	STEERING ANGLE SENSOR
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1	B	STRG ANGLE SENS GND
2	P	CAN-L
4	R	STRG ANGLE SENS POWER
5	L	CAN-H

Connector No.	M23
Connector Name	COMBINATION METER
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
25	Y	BATTERY
31	B	GND (POWER)
32	R	RUN START

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
13	P	CAN-L
17	O	ACC
21	B	GND (ILL)

Connector No.	M39
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1Q	R	–
4Q	Y	–

ABFIA0473GB

Connector No.	M108
Connector Name	YAW RATE/SIDE/DECEL G SENSOR
Connector Color	BLACK

H.S.

1	2	3	4	5	6

Terminal No.	Color of Wire	Signal Name
3	GR	IGN
4	BR	CAN-H
5	LG	CAN-L
6	B	GND

Connector No.	M78
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
4	L	–
6	BR	–
7	GR	–
13	P	–
15	G	–
16	LG	–

Connector No.	M45
Connector Name	JOINT CONNECTOR-M01
Connector Color	BLUE

H.S.

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

Terminal No.	Color of Wire	Signal Name
2	L	–
5	L	–
8	L	–
11	P	–
14	P	–
17	P	–

Connector No.	E21
Connector Name	BRAKE FLUID LEVEL SWITCH
Connector Color	BLACK

H.S.

1	2

Terminal No.	Color of Wire	Signal Name
1	L	–
2	B	–

Connector No.	E18
Connector Name	FRONT WHEEL SENSOR LH
Connector Color	BLACK

H.S.

1	2

Terminal No.	Color of Wire	Signal Name
1	SB	–
2	G	–

Connector No.	M117
Connector Name	VDC OFF SWITCH
Connector Color	GRAY

H.S.

6	5	4	3	2	1

Terminal No.	Color of Wire	Signal Name
1	G	–
2	B	–

ABFIA0474GB

Terminal No.	Color of Wire	Signal Name
12C	V	–
13C	P	–
14C	BR	–
15C	R	–

Connector No.	E41
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Connector No.	E117
Connector Name	FRONT WHEEL SENSOR RH
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	V	–

Connector No.	E38
Connector Name	STOP LAMP SWITCH
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	O	–
2	LG	–
3	BR	–
4	R	–

Connector No.	E55
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
4	L	–
6	BR	–
7	GR	–
13	P	–
15	G	–
16	LG	–

Connector No.	E51
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1T	O	–
2T	W	–

ABFIA0475GB

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

9	8	7	6		5	4	3
18	17	16	15	14	13	12	11	10

Terminal No.	Color of Wire	Signal Name
15	GR	ABS IGN SUPPLY

Connector No.	E125
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color	BLACK

H.S.

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

Terminal No.	Color of Wire	Signal Name
1	G	BS SOL
2	B	GND 2
3	B	GND 1
4	W	MTR POWER-1
5	–	–
6	–	–
7	–	–
8	–	–
9	BR	YG CAN-H
10	LG	YG CAN-L
11	–	–
12	–	–
13	L	LBL
14	–	–
15	–	–
16	–	–
17	BR	STP2
18	GR	IGN-1

Terminal No.	Color of Wire	Signal Name
19	V	FR SENS-
20	SB	FL SENS+
21	R	RR SENS-
22	V	RL SENS+
23	–	–
24	–	–
25	–	–
26	–	–
27	P	CAN-L
28	–	–
29	–	–
30	–	–
31	–	–
32	–	–
33	LG	FR SENS+
34	G	FL SENS-
35	BR	RR SENS+
36	P	RL SENS-
37	LG	STP
38	–	–
39	G	VDC OFF
40	–	–
41	L	CAN-H
42	–	–
43	–	–
44	–	–
45	–	–
46	W	STPO

ABFIA0476GB

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
12C	V	–
13C	P	–
13C	BR	–
14C	R	–

Connector No.	E128
Connector Name	STOP LAMP RELAY
Connector Color	BLUE

H.S.

Terminal No.	Color of Wire	Signal Name
1	GR	–
2	W	–
3	O	–
5	LG	–

Connector No.	E127
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
47	W	MTR POWER-2
48	B	GND 3
49	W	IGN-2

Connector No.	C11
Connector Name	REAR WHEEL SENSOR LH
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	V	–
2	P	–

Connector No.	C10
Connector Name	REAR WHEEL SENSOR RH
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	BR	–
2	R	–

ABFIA0477GB

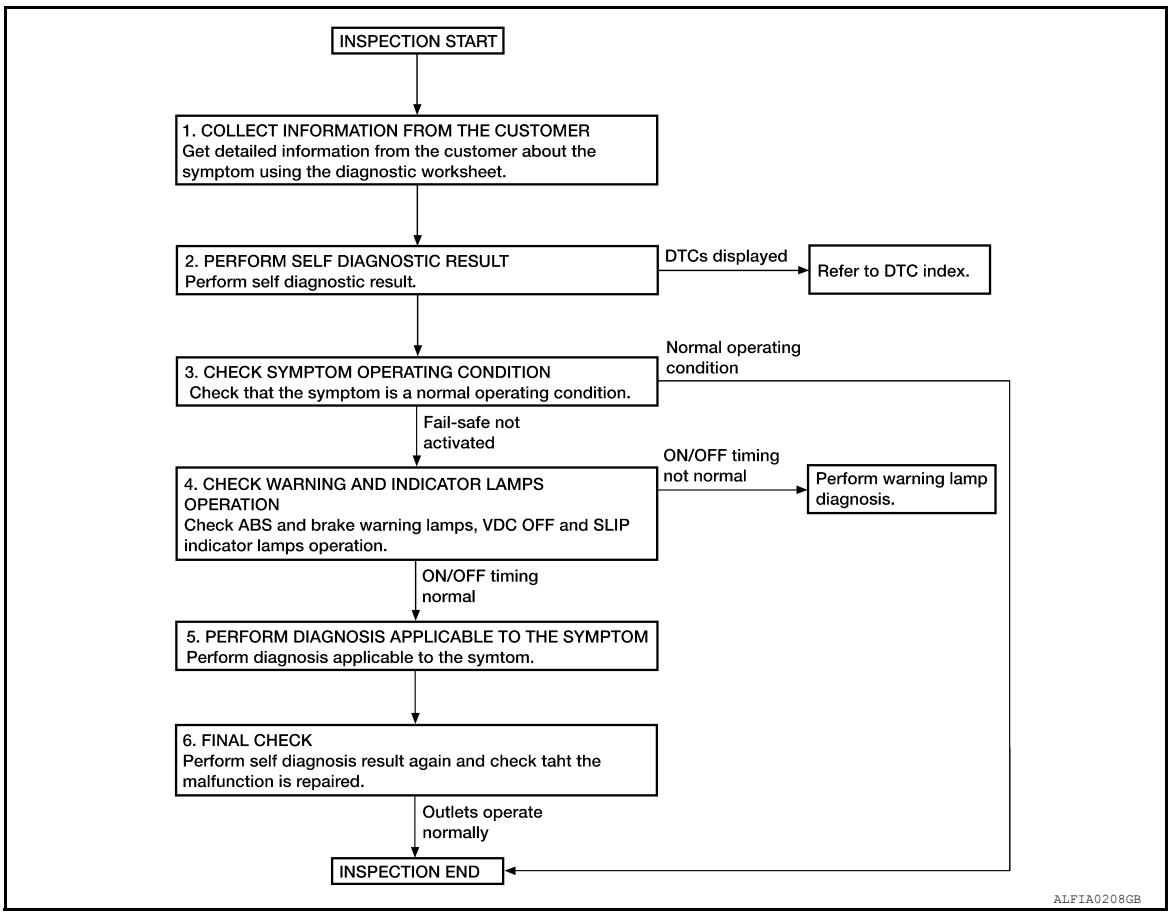
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000006968380

OVERALL SEQUENCE



DETAILED FLOW

1.COLLECT INFORMATION FROM THE CUSTOMER

Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnostic worksheet. Refer to BRC-53, "Diagnostic Work Sheet".

>> GO TO 2.

2.PERFORM SELF DIAGNOSTIC RESULT

Perform self diagnostic result. Refer to BRC-32, "CONSULT Function (ABS)".

Are any DTCs displayed?

YES >> Refer to BRC-44, "DTC Index".
NO >> GO TO 3.

3.CHECK SYMPTOM OPERATING CONDITION

Check that the symptom is a normal operating condition. Refer to BRC-112, "Description".

Is the symptom a normal operating condition?

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

4.CHECK WARNING AND INDICATOR LAMPS OPERATION

Check ABS and brake warning lamps, VDC OFF and SLIP indicator lamps operation. Refer to BRC-12, "VDC/TCS/ABS : System Description".

Is ON/OFF timing normal?

YES >> GO TO 5.
NO >> Perform warning lamp diagnosis. Refer to BRC-101, "Component Function Check" (ABS warning lamp), BRC-102, "Component Function Check" (brake warning lamp), BRC-103, "Component Function Check" (VDC OFF indicator lamp) or BRC-104, "Component Function Check" (SLIP indicator lamp).

5. PERFORM DIAGNOSIS APPLICABLE TO THE SYMPTOM

Perform diagnosis applicable to the symptom. Refer to BRC-105, "Symptom Table".

>> GO TO 6.

6. FINAL CHECK

Perform self diagnostic result again, and check that the malfunction is repaired. After checking, erase the self diagnosis memory. Refer to BRC-32, "CONSULT Function (ABS)".

>> Inspection End.

Diagnostic Work Sheet

INFOID:0000000006968381

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work (Wheels lock when braking)	☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

SFIA3265E

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

Description

INFOID:0000000006968397

After replacing the ABS actuator and electric unit (control unit), perform the following procedures:
- Neutral position adjustment for the steering angle sensor
- Calibration of the decel G sensor

Work Procedure

INFOID:0000000006968398

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to BRC-55, "Work Procedure", GO TO 2

2.PERFORM CALIBRATION OF THE DECEL G SENSOR

Perform calibration of the decel G sensor.

>> Refer to BRC-57, "Work Procedure".

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:0000000006968399

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

×: Required –: Not required

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

Work Procedure

INFOID:0000000006968400

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

CAUTION:

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

1.ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2

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

1. On the CONSULT screen, touch “WORK SUPPORT” and “ST ANG SEN ADJUSTMENT” in order.
2. Touch “START”.
   CAUTION:
   Do not touch steering wheel while adjusting steering angle sensor.
3. After approximately 10 seconds, touch “END”.
   NOTE:
   After approximately 60 seconds, it ends automatically.
4. Turn ignition switch OFF, then turn it ON again.
   CAUTION:
   Be sure to perform above operation.

>> GO TO 3

3.CHECK DATA MONITOR

1. Run vehicle with front wheels in straight-ahead position, then stop.
2. Select “DATA MONITOR”. Then make sure “STR ANGLE SIG” is within 0±2.5°.

Is the steering angle within the specified range?

YES >> GO TO 4
NO >> Perform the neutral position adjustment for the steering angle sensor again, GO TO 1

4.ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to BRC-32, "CONSULT Function (ABS)".
- ECM: Refer to EC-67, "CONSULT Function" (VQ40DE) or EC-505, "CONSULT Function" (VK56DE).

Are the memories erased?

YES >> Inspection End
NO >> Check the items indicated by the self-diagnosis.

CALIBRATION OF DECEL G SENSOR

Description

INFOID:0000000006968401

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

×: Required –: Not required

Situation	Calibration of decel G sensor
Removing/Installing ABS actuator and electric unit (control unit)	—
Replacing ABS actuator and electric unit (control unit)	×
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:0000000006968402

CALIBRATION OF DECEL G SENSOR

CAUTION:

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

1.ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2

2.PERFORM CALIBRATION OF DECEL G SENSOR

1. On the CONSULT screen, touch “WORK SUPPORT” and “DECEL G SEN CALIBRATION” in order.
2. Touch “START”.
3. After approximately 10 seconds, touch “END”.
   NOTE:
   After approximately 60 seconds, it ends automatically.
4. Turn ignition switch OFF, then turn it ON again.
   CAUTION:
   Be sure to perform above operation.

>> GO TO 3

3.CHECK DATA MONITOR

1. Run vehicle with front wheels in straight-ahead position, then stop.
2. Select “DATA MONITOR”. Then make sure “DECEL G SEN” is within ± 0.08G.

Is the inspection result normal?

YES >> GO TO 4
NO >> Perform calibration of decel G sensor again, GO TO 1

4.ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to BRC-32, "CONSULT Function (ABS)".
- ECM: Refer to EC-67, "CONSULT Function" (VQ40DE) or EC-505, "CONSULT Function" (VK56DE).

Are the memories erased?

YES >> Inspection End
NO >> Check the items indicated by the self-diagnosis.

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Logic

INFOID:0000000006920643

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1101	RR RH SENSOR-1	When an open circuit is detected in rear wheel sensor RH circuit.	• 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 wheel sensor LH circuit.	
C1103	FR RH SENSOR-1	When an open circuit is detected in front wheel sensor RH circuit.	
C1104	FR LH SENSOR-1	When an open circuit is detected in front wheel sensor LH circuit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF DIAGNOSTIC RESULT

With CONSULT.

1. Start engine and drive vehicle at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
2. Perform self diagnostic result.

Is DTC C1101, C1102, C1103 or C1104 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-59, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920644

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

CAUTION:
Do not check between wheel sensor terminals.

1. CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector E125 and wheel sensor connector of wheel with DTC.
2. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2. CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
2. Turn on the ABS active wheel sensor tester power switch.
   NOTE:
   The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.
3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.
   NOTE:
   If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to BRC-113, "FRONT WHEEL SENSOR : Removal and Installation" or BRC-114, "REAR WHEEL SENSOR : Removal and Installation".

3.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E125 and wheel sensor connector of wheel with DTC.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E125	20	E18	1	Yes
		34		2	
Front RH		33	E117	1	
		19		2	
Rear LH		22	C11	1	
		36		2	
Rear RH		35	C10	1	
		21		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".

NO >> Repair the circuit.

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Logic

INFOID:0000000006920645

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1105	RR RH SENSOR-2	• When power supply voltage of rear wheel sensor RH is low. • When distance between rear wheel sensor RH and rear wheel sensor RH rotor is large. • When installation of rear wheel sensor RH or rear wheel sensor RH rotor is not normal.	• Harness or connector • Wheel sensor • ABS actuator and electric unit (control unit) • Sensor rotor
C1106	RR LH SENSOR-2	• When power supply voltage of rear wheel sensor-LH is low. • When distance between rear wheel sensor LH and rear wheel sensor LH rotor is large. • When installation of rear wheel sensor LH or rear wheel sensor LH rotor is not normal.	
C1107	FR RH SENSOR-2	• When power supply voltage of front wheel sensor RH is low. • When distance between front wheel sensor RH and front wheel sensor RH rotor is large. • When installation of front wheel sensor RH or front wheel sensor RH rotor is not normal.	
C1108	FR LH SENSOR-2	• When power supply voltage of front wheel sensor LH is low. • When distance between front wheel sensor LH and front wheel sensor LH rotor is large. • When installation of front wheel sensor LH or front wheel sensor LH rotor is not normal.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Start engine and drive vehicle at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
2. Perform self diagnostic result.

Is DTC C1105, C1106, C1107 or C1108 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-61, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920646

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector E125 and wheel sensor connector of wheel with DTC.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
2. Turn on the ABS active wheel sensor tester power switch.
   NOTE:
   The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.
3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.
   NOTE:
   If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace the wheel sensor. Refer to BRC-113, "FRONT WHEEL SENSOR : Removal and Installation" or BRC-114, "REAR WHEEL SENSOR : Removal and Installation".

3. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to FAX-5, "On-Vehicle Inspection and Service" (front) or RAX-5, "On-Vehicle Inspection" (rear).

Is the inspection result normal?

YES >> GO TO 4
NO >> Repair or replace as necessary. Refer to FAX-6, "Removal and Installation" (front) or RAX-6, "Removal and Installation" (rear).

4. CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground of wheel with DTC.

Wheel Sensor			Ground	Continuity
Wheel	Connector	Terminal		
Front LH	E18	1	—	No
		2		
Front RH	E117	1		
		2		
Rear LH	C11	1		
		2		
Rear RH	C10	1		
		2		

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Repair the circuit.

C1109 POWER AND GROUND SYSTEM

DTC Logic

INFOID:0000000006920648

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1109	BATTERY VOLTAGE [ABNORMAL]	• When ignition voltage is 10 V or less. • When ignition voltage is 16 V or more.	• Harness or connector • ABS actuator and electric unit (control unit) • Fuse • Ignition power supply system • Battery

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1109 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-63, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920649

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 18 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage
Connector	Terminal			
E125	18	—	Ignition switch ON	Battery voltage
			Ignition switch OFF	0V

Is the inspection result normal?

YES >> GO TO 3
NO >> Repair or replace malfunctioning components.

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

Check voltage between ABS actuator and electric unit (control unit) connector E127 terminal 49 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage
Connector	Terminal			
E127	49	—	Ignition switch ON	Battery voltage
			Ignition switch OFF	0V

Is the inspection result normal?

YES >> GO TO 4
NO >> Repair or replace malfunctioning components.

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

1. Turn ignition switch OFF.
2. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 2, 3 and ground and connector E127 terminal 48 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	2	Ground	Yes
	3		
E127	48		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

C1111 PUMP MOTOR

DTC Logic

INFOID:0000000006920650

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1111	PUMP MOTOR	• When a malfunction is detected in motor or motor relay. • When a low pressure malfunction is detected in accumulator. • When a malfunction is detected in accumulator pressure sensor.	• Harness or connector • ABS actuator and electric unit (control unit) • Fusible link • Battery power supply system • Motor/accumulator assembly

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF.
2. Depress brake pedal 20 times or more.
3. Start the engine and wait for 3 minutes or more.
4. Perform self diagnostic result.

Is DTC C1111 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-65, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920651

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK ABS MOTOR AND MOTOR RELAY BATTERY POWER SUPPLY

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 4 and ground and E127 Terminal 47 and ground.

ABS actuator and electric unit (control unit)		—	Voltage
Connector	Terminal		
E125	4	Ground	Battery voltage
E127	47		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 2, 3 and ground and E127 Terminal 48 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	2	Ground	Yes
	3		
E127	48		

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace malfunctioning components.

4. CHECK MOTOR/ACCUMULATOR ASSEMBLY

Check motor/accumulator assembly. Refer to BR-14, "Inspection".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Replace motor/accumulator assembly. Refer to BR-25, "Removal and Installation" and BR-37, "Disassembly and Assembly".

C1115 ABS SENSOR [ABNORMAL SIGNAL]

DTC Logic

INFOID:0000000006920652

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 while the vehicle is driven, because of installation of tires other than specified.	• Harness or connector • Wheel sensor • Sensor rotor • ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.

1. Start engine and drive vehicle at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
2. Perform self diagnostic result.

Is DTC C1115 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-67, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920653

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector E125 and wheel sensor connector of wheel with DTC.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
2. Turn on the ABS active wheel sensor tester power switch.
   NOTE:
   The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.
3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.
   NOTE:
   If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace the wheel sensor. Refer to BRC-113, "FRONT WHEEL SENSOR : Removal and Installation" or BRC-114, "REAR WHEEL SENSOR : Removal and Installation".

3.CHECK TIRES

Check the inflation pressure, wear and size of each tire.

Is the inspection result normal?

YES >> GO TO 4
NO >> Adjust tire pressure, or replace tire(s).

4. CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground of wheel with DTC.

Wheel Sensor			Ground	Continuity
Wheel	Connector	Terminal		
Front LH	E18	1	—	No
		2		
Front RH	E117	1		
		2		
Rear LH	C11	1		
		2		
Rear RH	C10	1		
		2		

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair the circuit.

5. CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E125 and wheel sensor connector of wheel with DTC.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E125	20	E18	1	Yes
		34		2	
Front RH		33	E117	1	
		19		2	
Rear LH		22	C11	1	
		36		2	
Rear RH		35	C10	1	
		21		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Repair the circuit.

C1116 STOP LAMP SWITCH

DTC Logic

INFOID:0000000006920654

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 is depressed. • When stop lamp switch signal is not input when stop lamp relay operates.	• Harness or connector • Stop lamp switch • Stop lamp relay • ABS actuator and electric unit (control unit) • Battery power supply system

DTC CONFIRMATION PROCEDURE

1.CHECK DTC DETECTION

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1116 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-69, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920655

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector E125, stop lamp switch and stop lamp relay connectors.
3. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to BRC-72, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace stop lamp switch. Refer to BR-19, "Removal and Installation".

3.CHECK STOP LAMP RELAY

Check stop lamp relay. Refer to BRC-72, "Component Inspection (Stop Lamp Relay)".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace stop lamp relay.

4.CHECK STOP LAMP SWITCH POWER SUPPLY (1)

1. Connect stop lamp switch connector.
2. Turn ignition switch ON.
3. Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 17 and ground.

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E125	17	Ground	Brake pedal depressed	Battery voltage
			Brake pedal released	0 V

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 5.

5.CHECK STOP LAMP SWITCH CIRCUIT (1)

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch connector.
3. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 17 and stop lamp switch connector E38 terminal 3.

ABS actuator and electric unit (control unit)		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
E125	17	E38	3	Yes

4. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 17 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	17	Ground	No

Is the inspection result normal?

YES >> Repair or replace circuit between splice and stop lamp switch connector terminal 4.
NO >> Repair or replace circuit between stop lamp switch connector terminal 3 and ABS actuator and electric unit (control unit) connector E125 terminal 17.

6.CHECK STOP LAMP SWITCH POWER SUPPLY (2)

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 37 and ground.

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E125	37	Ground	Brake pedal depressed	Battery voltage
			Brake pedal released	0 V

Is the inspection result normal?

YES >> GO TO 8.
NO >> GO TO 7.

7.CHECK STOP LAMP SWITCH CIRCUIT (2)

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch and stop lamp relay connectors.
3. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 37 and stop lamp switch connector E38 terminal 2.

ABS actuator and electric unit (control unit)		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
E125	37	E38	2	Yes

4. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 37 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	37	Ground	No

Is the inspection result normal?

YES >> Repair or replace circuit between stop lamp switch connector terminal 1 and fuse block (J/B) connector E51 terminal 1T.

NO >> Repair or replace circuit between stop lamp switch connector terminal 2 and ABS actuator and electric unit (control unit) connector E125 terminal 37.

8. CHECK STOP LAMP RELAY OPERATION

1. Turn ignition switch OFF.
2. Connect stop lamp relay connector.
3. Connect a fused jumper wire between ABS actuator and electric unit (control unit) connector E125 terminal 46 and ground.
4. Turn ignition switch ON.
5. Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 37 and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	37	Ground	Battery voltage

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".

NO >> GO TO 9.

9. CHECK STOP LAMP RELAY SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect stop lamp relay connector.
3. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 37 and stop lamp relay connector E128 terminal 5.

ABS actuator and electric unit (control unit)		Stop lamp relay		Continuity
Connector	Terminal	Connector	Terminal	
E125	37	E128	5	Yes

4. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 37 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	37	Ground	No

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace circuit between stop lamp relay connector terminal 5 and ABS actuator and electric unit (control unit) connector E125 terminal 37.

10. CHECK STOP LAMP RELAY COIL CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 46 and stop lamp relay connector E128 terminal 2.

ABS actuator and electric unit (control unit)		Stop lamp relay		Continuity
Connector	Terminal	Connector	Terminal	
E125	46	E128	2	Yes

Is the inspection result normal?

YES >> GO TO 11.
NO >> Repair or replace circuit between stop lamp relay connector terminal 2 and ABS actuator and electric unit (control unit) connector E125 terminal 46.

11.CHECK STOP LAMP RELAY SWITCH POWER SUPPLY

1. Check voltage between stop lamp relay connector E128 terminal 3 and ground.

Stop lamp relay		—	Voltage (Approx.)
Connector	Terminal		
E128	3	Ground	Battery voltage

Is the inspection result normal?

YES >> Repair or replace circuit between splice and stop lamp relay connector terminal 1.
NO >> Repair or replace circuit between splice and stop lamp relay connector terminal 3.

Component Inspection (Stop Lamp Switch)

INFOID:0000000006920656

1.CHECK STOP LAMP SWITCH

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

Stop lamp switch Terminal	Condition	Continuity
1 – 2 3 – 4	Brake pedal is depressed	Yes
	Brake pedal is released	No

Is the inspection result normal?

YES >> Check stop lamp clearance. Refer to BR-7, "Inspection and Adjustment".
NO >> Replace stop lamp switch. Refer to BR-19, "Removal and Installation".

Component Inspection (Stop Lamp Relay)

INFOID:0000000006920657

1.CHECK STOP LAMP RELAY

1. Turn ignition switch OFF.
2. Disconnect stop lamp relay connector.
3. Apply battery voltage to stop lamp relay terminal 1 and ground to terminal 2.
4. Check continuity between stop lamp relay terminals 3 and 5.

Stop lamp relay terminals	Condition	Continuity
3 – 5	Battery voltage applied to terminal 1 and ground to terminal 2	Yes
	Voltage and ground removed	No

5. Check resistance between stop lamp relay connector terminals 1 and 2.

Stop lamp relay terminals	Resistance
1 – 2	Approx. 50 Ω

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace stop lamp relay.

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Logic

INFOID:0000000006920660

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.	• 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.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1120, C1122, C1124 or C1126 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-74, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920661

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 1 and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 2, 3 and ground and E127 Terminal 48 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	2	Ground	Yes
	3		
E127	48		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Logic

INFOID:0000000006920662

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.	• 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.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1121, C1123, C1125 or C1127 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-76, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006959264

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 1 and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 2, 3 and ground and E127 Terminal 48 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	2	Ground	Yes
	3		
E127	48		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

C1130 ENGINE SIGNAL

DTC Logic

INFOID:0000000006920664

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1130	ENGINE SIGNAL 1	When a malfunction is detected in ECM system.	• ECM • ABS actuator and electric unit (control unit) • CAN communication line

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1130 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-78, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920665

1.CHECK SELF DIAGNOSTIC RESULT FOR ENGINE SYSTEM

With CONSULT.
Perform self diagnostic result. Refer to EC-67, "CONSULT Function" (VQ40DE) or EC-505, "CONSULT Function" (VK56DE).

Are any ECM DTCs detected?

YES >> Refer to EC-91, "DTC Index" (VQ40DE) or EC-528, "DTC Index" (VK56DE).
NO >> GO TO 2.

2.CHECK SELF DIAGNOSTIC RESULT FOR ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

With CONSULT.
1. Perform self diagnostic result and erase DTCs.
2. Turn ignition switch OFF.
3. Start engine and drive vehicle for a short period of time.
4. Check that malfunction indicator lamp (MIL) turns OFF.
5. Stop vehicle and perform self diagnostic result.

Is DTC C1130 detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Check pin terminals and connection of connectors for abnormal conditions. Repair or replace malfunctioning components.

C1140 ACTUATOR RELAY SYSTEM

DTC Logic

INFOID:0000000006920666

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1140 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-79, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006959265

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 1 and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 2, 3 and ground and E127 Terminal 48 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	2	Ground	Yes
	3		
E127	48		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

C1142 PRESS SENSOR

DTC Logic

INFOID:0000000006968378

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1142	PRESS SEN CIRCUIT	When a malfunction is detected in master cylinder pressure sensor.	• Stop lamp switch system • ABS actuator and electric unit (control unit) • Brake system

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1142 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-81, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006968379

1.CHECK STOP LAMP SWITCH SYSTEM

Check stop lamp switch system. Refer to BRC-69, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning components.

2.CHECK BRAKE FLUID LEAKAGE

Check brake fluid leakage. Refer to BR-9, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning components.

3.CHECK BRAKE PEDAL

Check brake pedal. Refer to BR-7, "Inspection and Adjustment".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace malfunctioning components.

4.CHECK HYDRAULIC BOOSTER ASSEMBLY

Check hydraulic booster assembly. Refer to BR-14, "Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning components.

5.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.
3. Erase DTCs.
4. Start engine and drive vehicle for a short period of time.
5. Turn ignition switch OFF to ON.

6. Perform self diagnostic result.

Is DTC C1142 detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation"

NO >> Inspection End.

C1143 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000006920670

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.	• 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.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1143 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-83, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920671

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK STEERING ANGLE SENSOR MOUNTING CONDITION

Check steering angle sensor mounting condition.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning components.

3.CHECK STEERING ANGLE SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect steering angle sensor connector.
3. Turn ignition switch ON.
4. Check voltage between steering angle sensor connector M17 terminal 4 and ground.

Steering angle sensor		—	Voltage (Approx.)
Connector	Terminal		
M17	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect fuse block (J/B) connector M39.
3. Check continuity between steering angle sensor connector M17 terminal 4 and fuse block (J/B) connector M39 terminal 1Q.

Steering angle sensor		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M17	4	M39	1Q	Yes

4. Check continuity between steering angle sensor connector M17 terminal 4 and ground.

Steering angle sensor		—	Continuity
Connector	Terminal		
M17	4	Ground	No

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to PG-20, "Wiring Diagram — Ignition Power Supply —".
NO >> Repair or replace malfunctioning components.

5. CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between steering angle sensor connector M17 terminal 1 and ground.

Steering angle sensor		—	Continuity
Connector	Terminal		
M17	1	Ground	Yes

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace malfunctioning components.

6. CHECK CAN COMMUNICATION LINE

Check “STRG BRANCH LINE CIRCUIT”. Refer to LAN-63, "Diagnosis Procedure" (Type 1) or LAN-79, "Diagnosis Procedure" (Type 2).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Logic

INFOID:0000000006920672

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1144 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-85, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920673

1.ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to BRC-55, "Work Procedure".

>> GO TO 2.

2.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
Perform self diagnostic result.

Is DTC C1144 detected?

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

3.CHECK STEERING ANGLE SENSOR SYSTEM

Check steering angle sensor system. Refer to BRC-83, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

DTC Logic

INFOID:0000000006920674

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1145	YAW RATE SENSOR	• When a malfunction is detected in yaw rate signal. • When yaw rate signal is not continuously received for 2 seconds or more. • When side G signal is not continuously received for 2 seconds or more. • When decel G signal is not continuously received for 2 seconds or more.	• 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.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1145 or C1146 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-86, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920675

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

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, SLIP indicator 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 leaves the turntable or moving unit and the engine is started again. In that case, erase self-diagnosis result memory using CONSULT.**

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) and yaw rate/side/decel G sensor connectors.
3. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK YAW RATE/SIDE/DECEL G SENSOR MOUNTING CONDITION

Check yaw rate/side/decel G sensor mounting condition. Refer to BRC-117, "Exploded View".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning components.

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

1. Turn ignition switch OFF.
2. Disconnect yaw rate/side/decel G sensor connector.
3. Turn the ignition switch ON.
4. Check voltage between yaw rate/side/decel G sensor connector M108 terminal 3 and ground.

Yaw rate/side/decel G sensor		—	Voltage (Approx.)
Connector	Terminal		
M108	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair circuit between splice and yaw rate/side/decel G sensor terminal 3.

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

1. Turn ignition switch OFF.
2. Check continuity between yaw rate/side/decel G sensor connector M108 terminal 6 and ground.

Yaw rate/side/decel G sensor		—	Continuity
Connector	Terminal		
M108	6	Ground	Yes

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning components.

5. CHECK COMMUNICATION LINES

1. Disconnect ABS actuator and electric unit (control unit) connector E125.
2. Check continuity between yaw rate/side/decel G sensor connector M108 terminals 4, 5 and ABS actuator and electric unit (control unit) connector E125 terminals 9, 10.

Yaw rate/side/decel G sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
M108	4	E125	9	Yes
	5		10	

3. Check continuity between yaw rate/side/decel G sensor connector M108 terminals 4, 5 and ground.

Yaw rate/side/decel G sensor		Ground	Continuity
Connector	Terminal		
M108	4	—	No
	5		

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace malfunctioning components.

6. CHECK COMMUNICATION LINES RESISTANCE

1. Connect ABS actuator and electric unit (control unit) connector E125.
2. Check resistance between yaw rate/side/decel G sensor connector M108 terminals 4, 5.

Yaw rate/side/decel G sensor		Resistance
Connector	Terminal	
M108	4	100 – 140 Ω
	5	

Is the inspection result normal?

YES >> Replace yaw rate/side/decel G sensor. Refer to BRC-117, "Removal and Installation".
NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".

C1155 BRAKE FLUID LEVEL SWITCH

DTC Logic

INFOID:0000000006920676

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1155	BR FLUID LEVEL LOW	• When brake fluid level low signal is detected. • When an open circuit is detected in brake fluid level switch circuit.	• Harness or connector • ABS actuator and electric unit (control unit) • Brake fluid level switch

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON and wait 1 minute or more.
2. Perform self diagnostic result.

Is DTC C1155 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-89, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920677

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK BRAKE FLUID LEVEL

Check brake fluid level. Refer to BR-9, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Refill brake fluid. Refer to BR-10, "Refilling".

3.CHECK BRAKE FLUID LEVEL SWITCH

Check brake fluid level switch. Refer to BRC-90, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace reservoir tank. Refer to BR-37, "Disassembly and Assembly".

4.CHECK BRAKE FLUID LEVEL SWITCH HARNESS

1. Disconnect brake fluid level switch connector.
2. Disconnect ABS actuator and electric unit (control unit) connector E125.
3. Check continuity between brake fluid level switch connector E21 terminal 1 and ABS actuator and electric unit (control unit) connector E125 terminal 13.

Brake fluid level switch		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E21	1	E125	13	Yes

4. Check continuity between brake fluid level switch connector E21 terminal 1 and ground.

Brake fluid level switch		—	Continuity
Connector	Terminal		
E21	1	Ground	No

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning components.

5.CHECK BRAKE FLUID LEVEL SWITCH GROUND

Check continuity between brake fluid level switch connector E21 terminal 2 and ground.

Brake fluid level switch		—	Continuity
Connector	Terminal		
E21	2	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000006920678

1.CHECK BRAKE FLUID LEVEL SWITCH

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

Brake fluid level switch terminals	Condition	Resistance
1 – 2	Brake fluid level is within specified level.	1.9 – 2.1 kΩ
	Brake fluid level is less than specified level.	1.0 Ω or less

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace reservoir tank. Refer to BR-37, "Disassembly and Assembly".

C1160 DECEL G SEN SET

DTC Logic

INFOID:0000000006920679

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.	• 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.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1160 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-91, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920680

1.DECEL G SENSOR CALIBRATION

Perform decel G sensor calibration. Refer to BRC-57, "Work Procedure".

>> GO TO 2.

2.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
Perform self diagnostic result.

Is DTC C1160 detected?

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

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

Check yaw rate/side/decel G sensor system. Refer to BRC-86, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

C1164, C1165, C1166, C1167 CV/SV SYSTEM

DTC Logic

INFOID:0000000006920681

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1164	CV 1	When a malfunction is detected in cut valve 1.	• Harness or connector • 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.	
C1166	SV 1	When a malfunction is detected in suction valve 1.	
C1167	SV 2	When a malfunction is detected in suction valve 2.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1164, C1165, C1166 or C1167 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-92, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006959266

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 1 and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 2, 3 and ground and E127 Terminal 48 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	2	Ground	Yes
	3		
E127	48		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

C1170 VARIANT CODING

DTC Logic

INFOID:0000000006920685

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.CHECK DTC DETECTION

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1170 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-94, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000006920686

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

Replace ABS actuator and electric unit (control unit) even if other display than “VARIANT CODING” is displayed in self diagnostic result.

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".

C118E ACCUMULATOR

DTC Logic

INFOID:0000000006920687

DTC DETECTION LOGIC

CAUTION:

The SLIP indicator lamp, ABS warning lamp and brake warning lamps turn ON and DTC C118E may be detected in self diagnostic result when the brake pedal is excessively operated, such as air bleeding. This is not a system malfunction because this occurs due to the temporary decrease in accumulator fluid pressure. The system returns to normal condition when the accumulator fluid pressure reaches the specified pressure with the ignition switch ON and the SLIP indicator lamp, ABS warning lamp, and brake warning lamp OFF.

DTC	Display Item	Malfunction detected condition	Possible causes
C118E	ACCUMULATOR PRESS	When performing excessive brake pedal operation with the vehicle stopped. [When accumulator fluid pressure reaches 11.43 MPa (114 bar, 116.6 kg/cm^2, 1657 psi) after reaching 17.3 MPa (173 bar, 176.5 kg/cm^2, 2509 psi.]	—

Diagnosis Procedure

INFOID:0000000006920688

1.ERASE SELF DIAGNOSTIC RESULT

CAUTION:

The SLIP indicator lamp, ABS warning lamp and brake warning lamps turn ON and DTC C118E may be detected in self diagnostic result when the brake pedal is excessively operated, such as air bleeding. This is not a system malfunction because this occurs due to the temporary decrease in accumulator fluid pressure. The system returns to normal condition when the accumulator fluid pressure reaches the specified pressure with the ignition switch ON and the SLIP indicator lamp, ABS warning lamp, and brake warning lamp OFF.

With CONSULT.

1. Perform self diagnostic result.
2. Erase DTCs.
3. Turn ignition switch OFF.
4. Depress brake pedal to full stroke 20 times or more.
5. Start engine, and wait 2 minutes or more.
6. Check that SLIP indicator lamp, ABS warning lamp and brake warning lamps turn OFF.
7. Perform self diagnostic result.

Is any DTC detected?

YES >> Refer to BRC-44, "DTC Index".
NO >> Inspection End.

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000006920689

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:0000000006920690

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

Diagnosis Procedure

INFOID:0000000006920691

1.CHECK DTC DETECTION

With CONSULT.
1. Turn ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC U1000 detected?

YES >> Proceed to diagnosis procedure. Refer to LAN-15, "Trouble Diagnosis Flow Chart".
NO >> Refer to GI-39, "Intermittent Incident".

PARKING BRAKE SWITCH

Component Function Check

INFOID:0000000006920694

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-97, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006920695

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect combination meter connector M23 and parking brake switch connector.
3. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK PARKING BRAKE SWITCH

Check parking brake switch. Refer to BRC-98, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace parking brake switch. Refer to PB-6, "Exploded View".

3.CHECK PARKING BRAKE SWITCH SIGNAL

With CONSULT.

1. Connect combination meter connector M23 and parking brake switch connector.
2. Turn ignition switch ON.
3. In “DATA MONITOR” select “PARK BRAKE SW” and check parking brake switch signal.

Condition	DATA MONITOR
Depress parking brake	On
Release parking brake	Off

Is the inspection result normal?

YES >> Refer to MWI-43, "Work Flow".
NO >> GO TO 4.

4.CHECK PARKING BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector M23 and parking brake switch connector.
3. Check continuity between parking brake switch connector M11 terminal 1 and combination meter connector M23 terminal 33.

Parking brake switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
M11	1	M23	33	Yes

4. Check continuity between parking brake switch connector M11 terminal 1 and ground.

Parking brake switch		—	Continuity
Connector	Terminal		
M11	1	Ground	No

Is the inspection result normal?

YES >> Replace combination meter. Refer to MWI-64, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000006920696

1.CHECK PARKING BRAKE SWITCH

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

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace parking brake switch. Refer to PB-6, "Exploded View".

VDC OFF SWITCH

Component Function Check

INFOID:0000000006920697

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-99, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006920698

Regarding Wiring Diagram information, refer to BRC-45, "Wiring Diagram".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector E125 and VDC OFF switch connector.
3. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to BRC-100, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace VDC OFF switch. Refer to BRC-119, "Removal and Installation".

3.CHECK VDC OFF SWITCH SIGNAL

With CONSULT.

1. Connect ABS actuator and electric unit (control unit) connector E125 and VDC OFF switch connector.
2. Turn ignition switch ON.
3. In “DATA MONITOR” select “OFF SW” and check VDC OFF switch signal.

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

Is the inspection result normal?

YES >> Refer to MWI-43, "Work Flow".
NO >> GO TO 4.

4.CHECK VDC OFF SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector E125 and VDC OFF switch connector.
3. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 39 and VDC OFF switch connector M117 terminal 1.

ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E125	39	M117	1	Yes

4. Check continuity between ABS actuator and electric unit (control unit) connector terminal E125 terminal 39 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	39	Ground	No

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning components.

5.CHECK VDC OFF SWITCH GROUND CIRCUIT

Check continuity between VDC OFF switch connector M117 terminal 2 and ground.

VDC OFF switch		—	Continuity
Connector	Terminal		
M117	2	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000006920699

1.CHECK VDC OFF SWITCH

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

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace VDC OFF switch. Refer to BRC-119, "Removal and Installation".

ABS WARNING LAMP

Component Function Check

INFOID:0000000006920700

1.CHECK ABS WARNING LAMP FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Proceed to diagnosis procedure. Refer to BRC-101, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006920701

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT.
Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to BRC-44, "DTC Index".
NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to MWI-13, "WARNING LAMPS/INDICATOR LAMPS : System Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Replace combination meter. Refer to MWI-64, "Removal and Installation".

BRAKE WARNING LAMP

Component Function Check

INFOID:0000000006920702

1.CHECK BRAKE WARNING LAMP FUNCTION (1)

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Proceed to diagnosis procedure. Refer to BRC-102, "Diagnosis Procedure".

2.CHECK BRAKE WARNING LAMP FUNCTION (2)

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Check parking brake switch system. Refer to BRC-97, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006968375

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT.
Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to BRC-44, "DTC Index".
NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to MWI-13, "WARNING LAMPS/INDICATOR LAMPS : System Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Replace combination meter. Refer to MWI-64, "Removal and Installation".

VDC OFF INDICATOR LAMP

Component Function Check

INFOID:0000000006920706

1.CHECK VDC OFF INDICATOR LAMP FUNCTION (1)

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Proceed to diagnosis procedure. Refer to BRC-103, "Diagnosis Procedure"

Diagnosis Procedure

INFOID:0000000006968376

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT.
Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to BRC-44, "DTC Index".
NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to MWI-13, "WARNING LAMPS/INDICATOR LAMPS : System Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Replace combination meter. Refer to MWI-64, "Removal and Installation".

SLIP INDICATOR LAMP

Component Function Check

INFOID:0000000006920704

1.CHECK SLIP INDICATOR LAMP FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Proceed to diagnosis procedure. Refer to BRC-104, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006968377

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT.
Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to BRC-44, "DTC Index".
NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to MWI-13, "WARNING LAMPS/INDICATOR LAMPS : System Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".
NO >> Replace combination meter. Refer to MWI-64, "Removal and Installation".

SYMPTOM DIAGNOSIS

VDC/TCS/ABS

Symptom Table

INFOID:0000000006968382

If ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp turn ON, perform self-diagnosis.

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-106, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-107, "Diagnosis Procedure"
	Make sure the braking force is sufficient when the ABS is not operating.	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-108, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-109, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-110, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-111, "Diagnosis Procedure"
	TCM	
	ECM	

NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal.

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

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:0000000006968383

1.CHECK START

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

Is the inspection result normal?

YES >> GO TO 2
NO >> Check brake system.

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles. Refer to front: FAX-5, "On-Vehicle Inspection and Service", rear: RAX-5, "On-Vehicle Inspection".

Is the inspection result normal?

YES >> GO TO 3
NO >> Repair or replace malfunctioning components.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following.
- Wheel sensor installation for damage
- Sensor rotor installation for damage
- Wheel sensor connector
- Wheel sensor harness

Is the inspection result normal?

YES >> GO TO 4
NO >>
- Replace wheel sensor BRC-113, "FRONT WHEEL SENSOR : Removal and Installation" (front wheel sensor) or BRC-114, "REAR WHEEL SENSOR : Removal and Installation" (rear wheel sensor).
- Replace sensor rotor BRC-115, "FRONT SENSOR ROTOR : Removal and Installation" (front sensor rotor) or BRC-115, "REAR SENSOR ROTOR : Removal and Installation" (rear sensor rotor).
- Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Perform self diagnostic result. Refer to BRC-32, "CONSULT Function (ABS)".

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000006968384

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-7, "Inspection and Adjustment".

Is the stroke too big?

YES >> • Bleed air from brake tube and hose. Refer to BR-10, "Bleeding Brake System".
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: BR-7, "Inspection and Adjustment" or hydraulic booster assembly BR-14, "Inspection".

NO >> GO TO 2

2.CHECK ABS FUNCTION

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

Is the inspection result normal?

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

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000006968385

CAUTION:

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

1.CHECK ABS FUNCTION

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

Is the inspection result normal?

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

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000006968386

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

1.CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Perform self diagnostic result. Refer to BRC-32, "CONSULT Function (ABS)".

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000006968387

CAUTION:

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

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

1.SYMPTOM CHECK 1

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

Do symptoms occur?

YES >> GO TO 2
NO >> Inspect the brake pedal.

2.SYMPTOM CHECK 2

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

Do symptoms occur?

YES >> GO TO 3
NO >> Perform self diagnostic result. Refer to BRC-32, "CONSULT Function (ABS)".

3.SYMPTOM CHECK 3

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

Do symptoms occur?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.
NO >> Inspection End.

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000006968388

1.SYMPTOM CHECK

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

Is the inspection result normal?

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

2.CHECK SELF DIAGNOSTIC RESULT

Perform self diagnostic result of ABS actuator and electric unit (control unit). Refer to BRC-32, "CONSULT Function (ABS)".

Are self diagnostic results indicated?

YES >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self diagnostic result again. Refer to BRC-32, "CONSULT Function (ABS)".
NO >> GO TO 3

3.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, etc.
4. Securely connect connector and perform ABS actuator and electric unit (control unit) self diagnostic result. Refer to BRC-32, "CONSULT Function (ABS)".

Are self diagnostic results indicated?

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

4.CHECK ECM AND TCM SELF DIAGNOSTIC RESULT

1. Perform ECM self diagnostic result. Refer to EC-67, "CONSULT Function" (VQ40DE) or EC-505, "CONSULT Function" (VK56DE).
2. Perform TCM self diagnostic result. Refer to TM-39, "CONSULT Function".

Are self diagnostic results indicated?

YES >> Check the corresponding items.
- ECM: Refer to EC-91, "DTC Index" (VQ40DE) or EC-528, "DTC Index" (VK56DE).
- TCM: Refer to TM-49, "DTC Index".

NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-116, "Removal and Installation".

NORMAL OPERATING CONDITION

Description

INFOID:0000000006968389

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

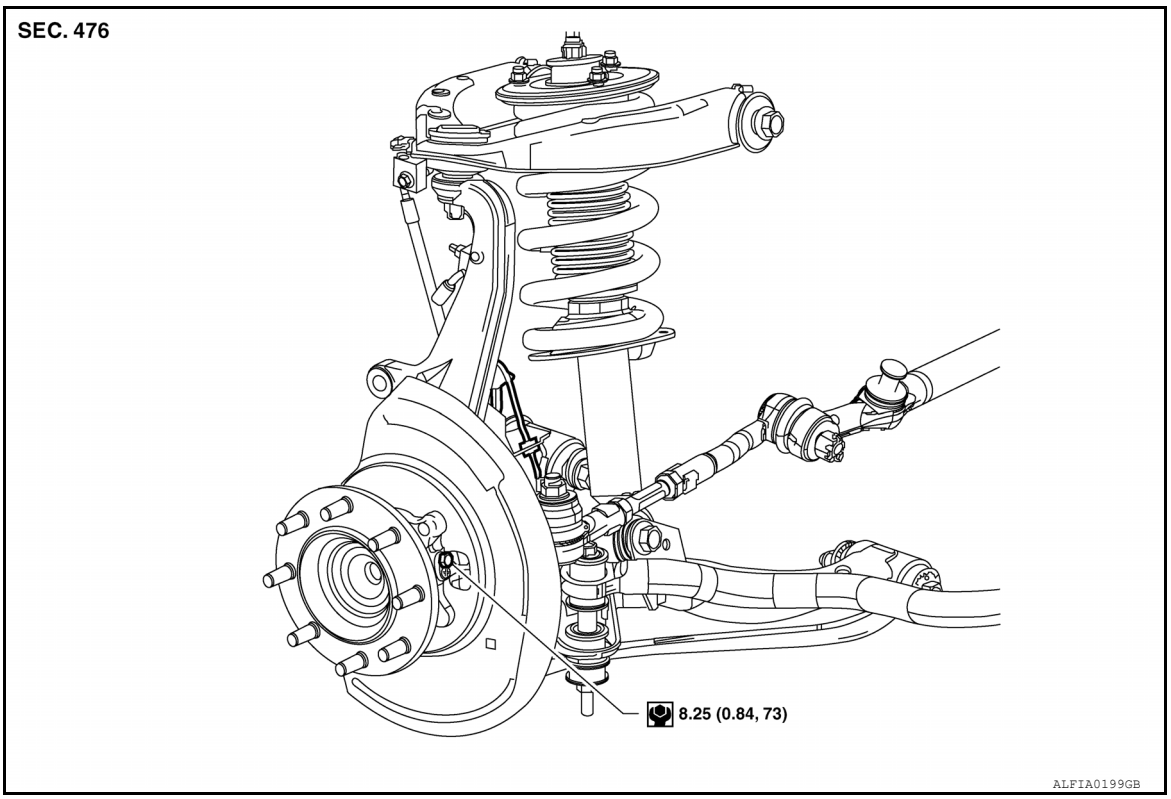
UNIT REMOVAL AND INSTALLATION

WHEEL SENSOR

FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:0000000006920721



FRONT WHEEL SENSOR : Removal and Installation

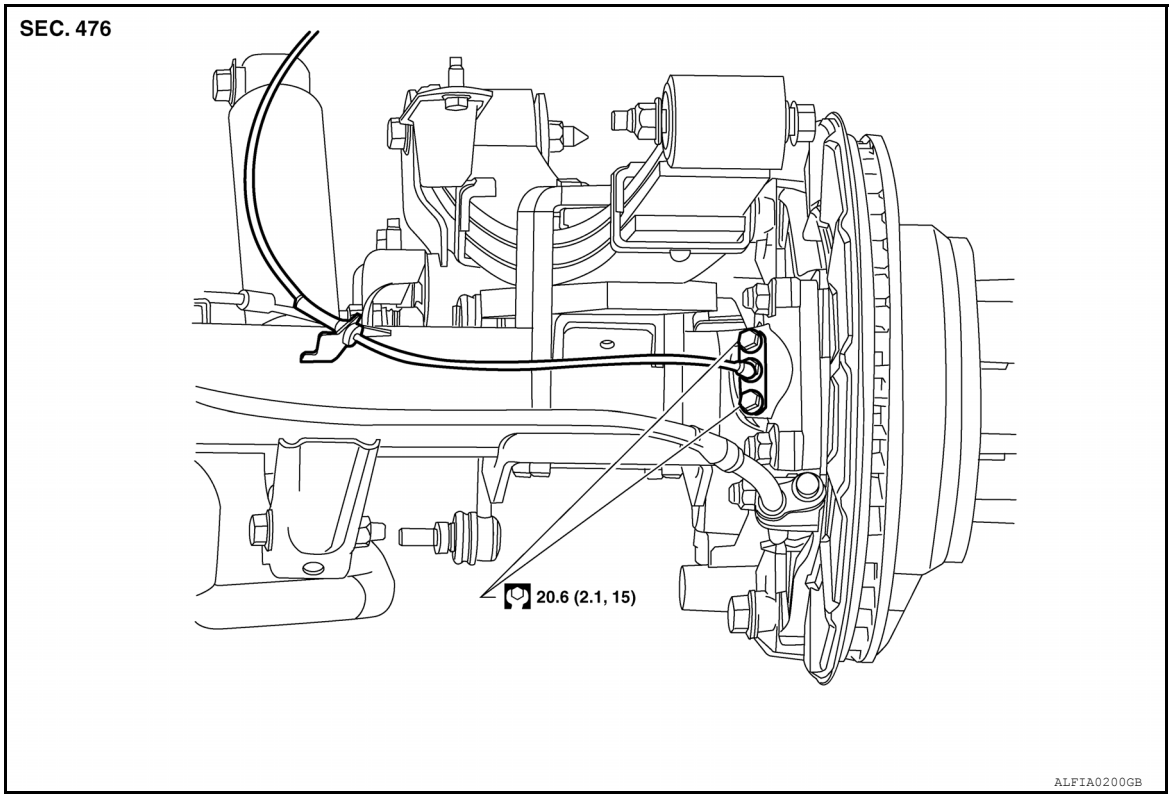
INFOID:0000000006920722

The front wheel sensor is part of the front wheel hub and bearing assembly and cannot be removed separately. To replace the front wheel sensor the front wheel hub and bearing assembly must be replaced. Refer to FAX-6, "Removal and Installation".

REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:0000000006920723



REAR WHEEL SENSOR : Removal and Installation

INFOID:0000000006920724

REMOVAL

1. Remove rear wheel sensor bolts.
2. Remove rear wheel sensor.
   CAUTION:
   - **Be careful not to damage sensor edge.**
   - **Do not pull on sensor harness to remove.**
   - **Do not twist rear wheel sensor during removal.**
3. Disconnect wheel sensor harness connector, then remove harness from attaching points.

INSTALLATION

Installation is in the reverse order of the removal.
- Check that grommet is fully inserted to bracket.
- Check that rear wheel sensor harness is not twisted after installation.

CAUTION:
Do not twist rear wheel sensor during installation.

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Removal and Installation

INFOID:0000000006920725

The front sensor rotor is an integral part of the front wheel hub and bearing assembly and cannot be disassembled. When replacing the front sensor rotor, replace the front wheel hub and bearing assembly. Refer to FAX-6, "Removal and Installation".

REAR SENSOR ROTOR

REAR SENSOR ROTOR : Removal and Installation

INFOID:0000000006920726

The rear sensor rotor is an integral part of the rear axle shaft assembly and cannot be disassembled. When replacing the rear sensor rotor, replace the rear axle shaft assembly. Refer to RAX-6, "Removal and Installation".

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Removal and Installation

INFOID:0000000006920727

REMOVAL

1. Remove hydraulic booster assembly. Refer to BR-25, "Removal and Installation".
   CAUTION:
   After replacing the hydraulic booster assembly or motor/accumulator assembly, always follow the accumulator disposal procedure to discard the hydraulic booster assembly or motor/accumulator assembly. Refer to BR-28, "Disposal".
2. Remove ABS actuator and electric unit (control unit). Refer to BR-37, "Disassembly and Assembly".

INSTALLATION

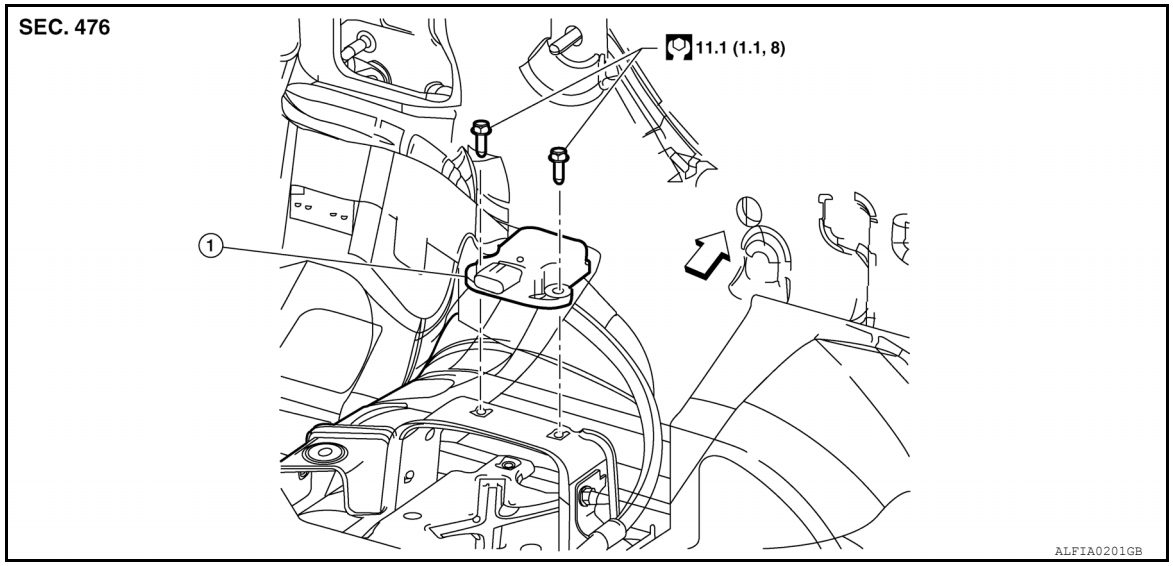
Installation is in the reverse order of removal.

- 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-25, "Removal and Installation".
- Do not remove and install hydraulic booster assembly by holding harness.
- Bleed air from brake piping after installation. Refer to BR-10, "Bleeding Brake System".
- Do not apply excessive impact to hydraulic booster assembly, such as by dropping it.
- Check that connector is fully locked after hydraulic booster assembly harness connector is installed.
- Perform decel G sensor calibration when hydraulic booster assembly [ABS actuator and electric unit (control unit)] is replaced. Refer to BRC-57, "Work Procedure".

YAW RATE/SIDE/DECEL G SENSOR

Exploded View

INFOID:0000000006920728



1. Yaw rate/side/decel G sensor ⇦ Front

Removal and Installation

INFOID:0000000006920729

REMOVAL

CAUTION:

- **Do not drop or strike yaw rate/side/decel G sensor, because it has little endurance to impact.**
- **Do not use a power tool.**

1. Remove instrument center finisher LH. Refer to IP-14, "Exploded View".
2. Remove the yaw rate/side/decel G sensor bolts.
3. Reposition the yaw rate/side/decel G sensor to access the harness connector.
4. Disconnect yaw rate/side/decel G sensor harness connector and remove the yaw rate/side/decel G sensor.

INSTALLATION

Installation is in the reverse order of removal.

- Perform yaw rate/side/decel G sensor calibration when yaw rate/side/decel G sensor is removed, installed, disconnected or replaced. Refer to BRC-57, "Work Procedure".

CAUTION:

- **Do not drop or strike yaw rate/side/decel G sensor, because it has little endurance to impact.**
- **Do not use a power tool.**

STEERING ANGLE SENSOR

Removal and Installation

INFOID:0000000006920730

REMOVAL

1. Remove spiral cable assembly. Refer to SR-7, "Removal and Installation".
2. Remove the screws, then remove the steering angle sensor from the spiral cable.

INSTALLATION

Installation is in the reverse order of removal.

- Perform steering angle sensor neutral position adjustment when steering angle sensor is removed, installed, disconnected or replaced. Refer to BRC-57, "Work Procedure".

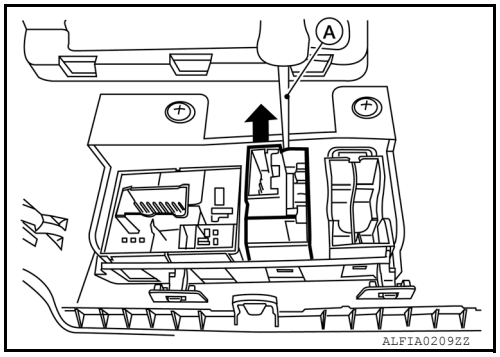
VDC OFF SWITCH

Removal and Installation

INFOID:0000000006920731

REMOVAL

1. Remove instrument lower panel LH. Refer to IP-15, "Removal and Installation".
2. Remove VDC OFF switch from switch carrier using a suitable tool (A) in the direction shown.



INSTALLATION

Installation is in the reverse order of removal.