SECTION BRC
BRAKE CONTROL SYSTEM

CONTENTS

WITH VDC

PRECAUTION

PRECAUTIONS

Precautions for Performing 2-wheel Drive Test

INFOID:0000000013508505

A vehicle with 2.2L diesel engine or 2.0L turbo gasoline engine of this model limits torque when a difference occurs in each wheel speed. For this reason, it is necessary to use Chassis Dynamometer Mode when performing the 2-wheel drive test (e.g. with 2-wheel chassis dynamometer, speedometer tester).
For Chassis Dynamometer Mode, refer to ENGINE >> ENGINE CONTROL SYSTEM >> BASIC INSPECTION >> CHASSIS DYNAMOMETER MODE >> Description.

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

INFOID:0000000012793704

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

WARNING:

Always observe the following items for preventing accidental activation.

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

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

WARNING:

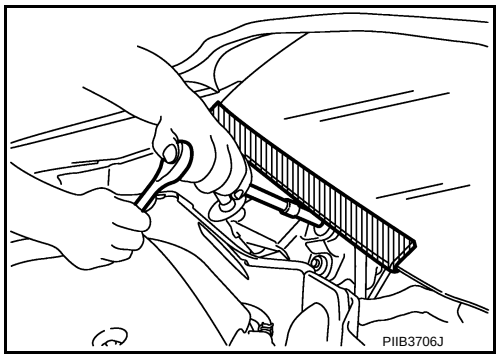
Always observe the following items for preventing accidental activation.

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

Precaution for Procedure without Cowl Top Cover

INFOID:0000000012793705

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



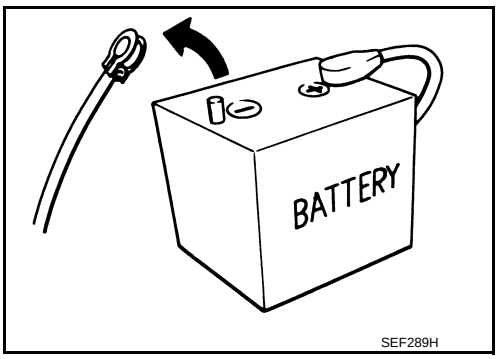
Precautions for Removing Battery Terminal

INFOID:0000000013501207

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

BR08DE	: 4 minutes	V9X engine	: 4 minutes
D4D engine	: 20 minutes	YD25DDTi	: 2 minutes
HR09DET	: 12 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		



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

- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:
- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
  - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
  - Driving for 30 minutes or more on a steep slope.

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

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

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

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

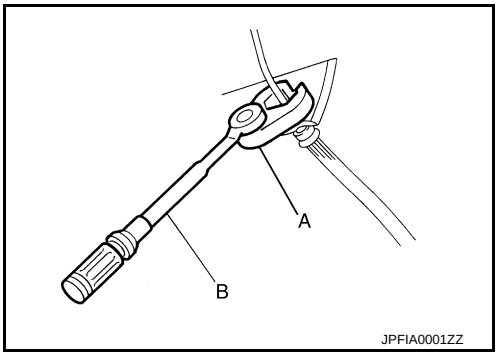
Precaution for Brake System

INFOID:0000000012793707

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

- Brake fluid use refer to MA-20, "Recommeded Fluids and Lubricants".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Never damage caliper (made by aluminum).
- Always loosen the brake tube flare nut with a flare nut wrench.

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



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Precaution for Brake Control System

INFOID:0000000012793708

- Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function or Brake force distribution function operates. This is not a malfunction because it is caused by VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function or Brake force distribution 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, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution 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, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution 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, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution 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 related parts are excessively worn or deteriorated and the vehicle is driven, ABS warning lamp, brake warning lamp and VDC warning lamp may turn ON, and the control may not operate normally for VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution 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, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution 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

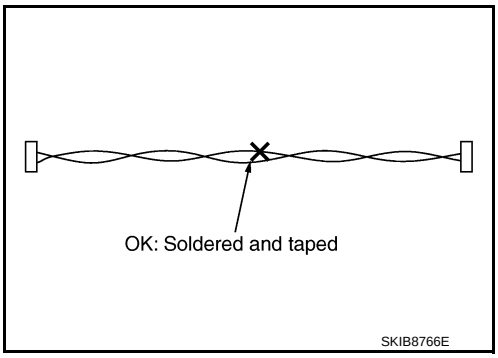
VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function.

- Brake pedal vibrates and operation sound occurs during sudden acceleration and cornering, when VDC function, TCS function, Brake assist function and Brake force distribution function is operated. This is not a malfunction because it is caused by VDC function, TCS function, Brake assist function or Brake force distribution function that is operated normally.
- VDC warning lamp may turn ON and VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function may not normally operate, when driving on a special road the is extremely slanted (bank in a circuit course). This is not a malfunction if the status returns to normal for VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function after the engine is started again. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory.
- A malfunction in yaw rate/side/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function, TCS function, Brake force distribution function are OFF (VDC OFF switch is pressed and VDC OFF indicator lamp is in ON status). This is not a malfunction if the status returns to normal for VDC function, TCS function and Brake force distribution function after the engine is started again. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory.

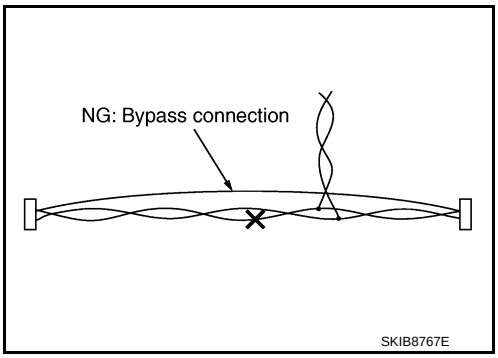
Precautions for Harness Repair

INFOID:0000000012793709

- Solder the repaired area and wrap tape around the soldered area.
  NOTE:
  A fray of twisted lines must be within 110 mm (4.33 in).



- Bypass connection is never allowed at the repaired area.
  NOTE:
  Bypass connection may cause CAN communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



- Replace the applicable harness as an assembly if error is detected on the shield lines of CAN communication line.

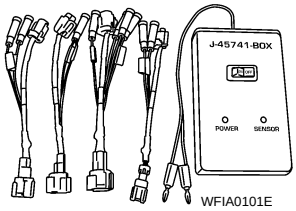
PREPARATION

PREPARATION

Special Service Tool

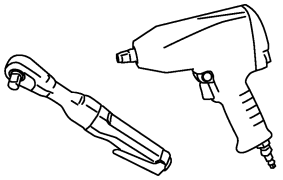
INFOID:0000000012793710

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

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

Commercial Service Tools

INFOID:0000000012793711

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

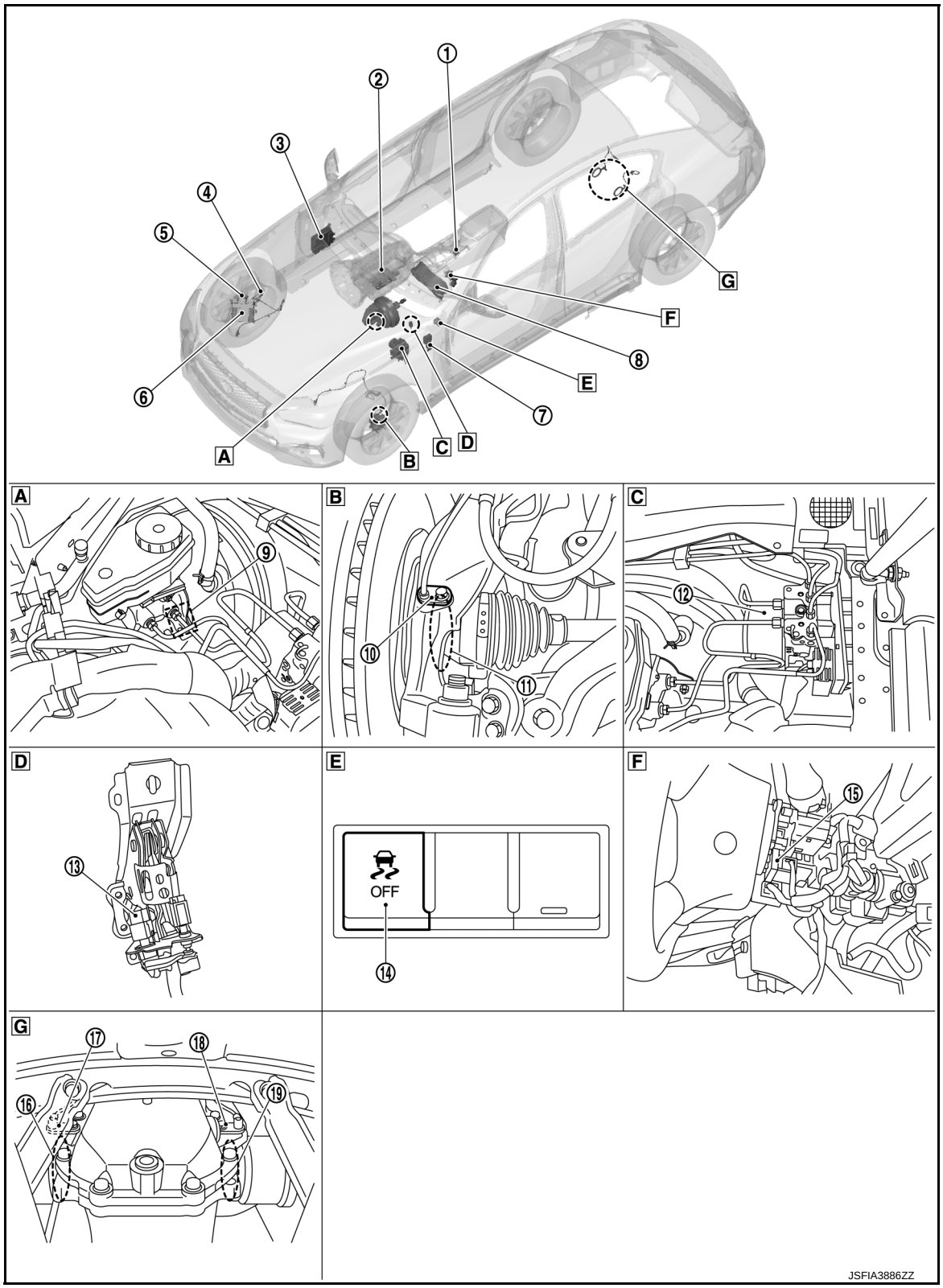
SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000012793712

FOR VR30DDTT ENGINE MODELS



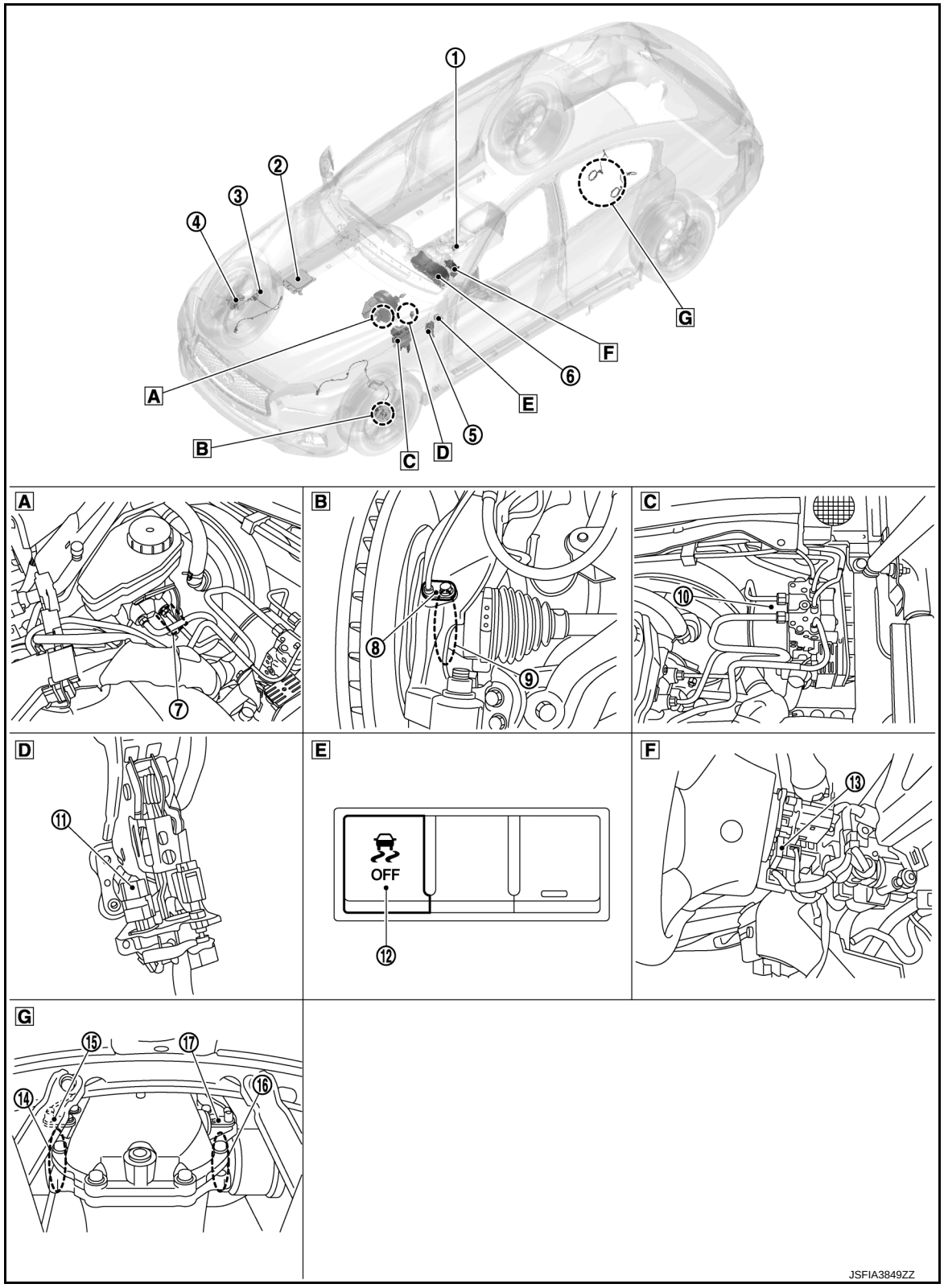
A Brake booster
B Steering knuckle
C Inside of brake master cylinder cover
D Brake pedal
E Instrument driver lower panel
F Back of spiral cable assembly
G Rear final drive

No.	Component parts	Function
①	Drive mode select switch	Mainly transmits the following signals to chassis control module unit. • Drive mode signal Refer to DMS-4, "Component Parts Location" for detailed installation location.
②	TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Current gear position signal Refer to TM-13, "A/T CONTROL SYSTEM : Component Parts Location" for detailed installation location.
③	Steering force control module*	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering pinion angle signal • Direct Adaptive Steering malfunction signal Refer to STC-113, "Component Parts Location" for detailed installation location.
④	Front RH wheel sensor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑤	Front RH sensor rotor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑥	ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine torque signal • Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal Refer to EC6-33, "ENGINE CONTROL SYSTEM : Component Parts Location" (VR30DDTT FOR USA AND CANADA), EC6-1024, "ENGINE CONTROL SYSTEM : Component Parts Location" (VR30DDTT FOR MEXICO) for detailed installation location.
⑦	Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Drive mode signal • Active Trace Control signal • Brake hold status signal • Brake hold request signal Refer to DAS-516, "Component Parts Location" for detailed installation location.
⑧	Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • ABS warning lamp signal • Brake warning lamp signal • VDC OFF indicator lamp signal • VDC warning lamp signal Refer to MWI-8, "METER SYSTEM : Component Parts Location" for detailed installation location.
⑨	Vacuum sensor	BRC-17, "Vacuum Sensor"
⑩	Front LH wheel sensor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑪	Front LH sensor rotor	BRC-14, "Wheel Sensor and Sensor Rotor"

No.	Component parts	Function
⑫	ABS actuator and electric unit (control unit)	BRC-15, "ABS Actuator and Electric Unit (Control Unit)"
⑬	Stop lamp switch	BRC-16, "Stop Lamp Switch"
⑭	VDC OFF switch	BRC-17, "VDC OFF Switch"
⑮	Steering angle sensor	BRC-16, "Steering Angle Sensor"
⑯	Rear LH sensor rotor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑰	Rear LH wheel sensor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑱	Rear RH wheel sensor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑲	Rear RH sensor rotor	BRC-14, "Wheel Sensor and Sensor Rotor"

*: With Direct Adaptive Steering

FOR 2.0L TURBO GASOLINE ENGINE MODELS



A Brake booster
B Steering knuckle
C Inside of brake master cylinder cover
D Brake pedal
E Instrument driver lower panel
F Back of spiral cable assembly
G Rear final drive

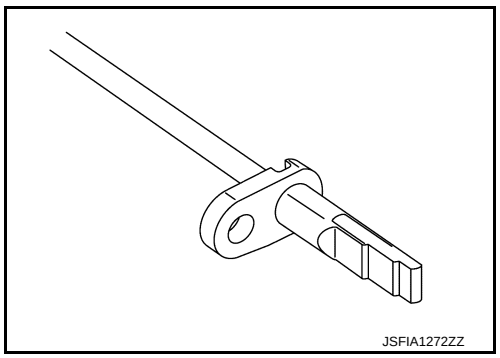
No.	Component parts	Function
①	Drive mode select switch	Mainly transmits the following signals to chassis control module unit. • Drive mode signal Refer to DMS-4, "Component Parts Location" for detailed installation location.
②	ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine torque signal • Engine speed signal • Current gear position signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal Refer to EC4-25, "ENGINE CONTROL SYSTEM : Component Parts Location" for detailed installation location.
③	Front RH wheel sensor	BRC-14, "Wheel Sensor and Sensor Rotor"
④	Front RH sensor rotor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑤	Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Drive mode signal • Active trace control signal • Brake hold status signal • Brake hold request signal Refer to DAS-516, "Component Parts Location" for detailed installation location.
⑥	Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • ABS warning lamp signal • Brake warning lamp signal • VDC OFF indicator lamp signal • VDC warning lamp signal Refer to MWI-8, "METER SYSTEM : Component Parts Location" for detailed installation location.
⑦	Vacuum sensor	BRC-17, "Vacuum Sensor"
⑧	Front LH wheel sensor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑨	Front LH sensor rotor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑩	ABS actuator and electric unit (control unit)	BRC-15, "ABS Actuator and Electric Unit (Control Unit)"
⑪	Stop lamp switch	BRC-16, "Stop Lamp Switch"
⑫	VDC OFF switch	BRC-17, "VDC OFF Switch"
⑬	Steering angle sensor	BRC-16, "Steering Angle Sensor"
⑭	Rear LH sensor rotor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑮	Rear LH wheel sensor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑯	Rear RH wheel sensor	BRC-14, "Wheel Sensor and Sensor Rotor"
⑰	Rear RH sensor rotor	BRC-14, "Wheel Sensor and Sensor Rotor"

Wheel Sensor and Sensor Rotor

INFOID:0000000012793713

NOTE:

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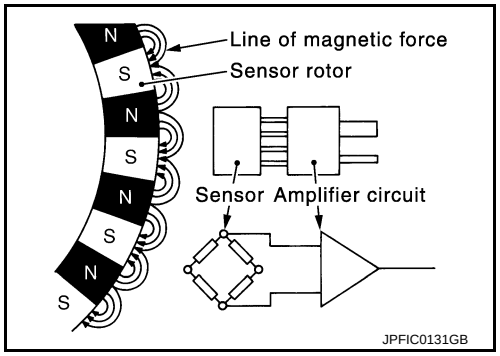
- Downsize and weight reduction is aimed. IC for detection portion and magnet for sensor rotor are adopted.
- Power supply is supplied to detection portion so that magnetic field line is read. Magnetic field that is detected is converted to current signal.
- When sensor rotor rotates, magnetic field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



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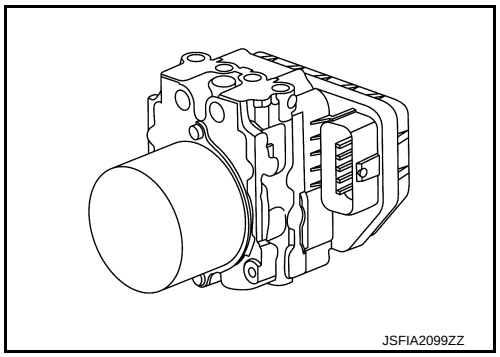
ABS Actuator and Electric Unit (Control Unit)

INFOID:0000000012793714

Electric unit (control unit) is integrated with actuator and comprehensively controls VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function.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ELECTRIC UNIT (CONTROL UNIT)

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

ACTUATOR

The following components are integrated with ABS actuator.

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

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

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

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

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

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

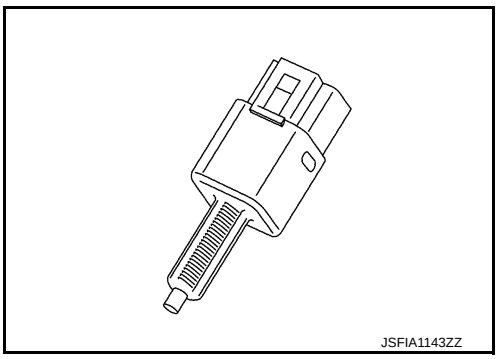
Cut Valve 1 (Primary Line), Cut Valve 2 (Secondary Line)
Shuts off the ordinary brake line from master cylinder, when VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function are activated.

Yaw Rate/Side/Decel G Sensor
Calculates the following information that affects the vehicle, and transmits a signal to ABS actuator and electric unit (control unit). [Yaw rate/side/decel G sensor is integrated in ABS actuator and electric unit (control unit).]
- Vehicle rotation angular velocity (yaw rate signal)
- Vehicle lateral acceleration (side G signal)
- Vehicle longitudinal acceleration (decel G signal)

Stop Lamp Switch

INFOID:0000000012793715

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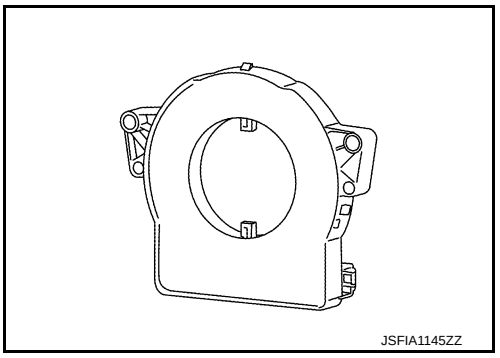
Steering Angle Sensor

INFOID:0000000012793716

Detects the following information and transmits steering angle signal to ABS actuator and electric unit (control unit) via CAN communication.
- Steering angle sensor malfunction signal
- Steering wheel rotation amount
- Steering wheel rotation angular velocity
- Steering wheel rotation direction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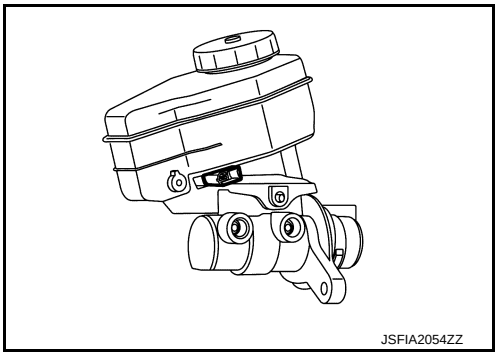
Brake Fluid Level Switch

INFOID:0000000012793717

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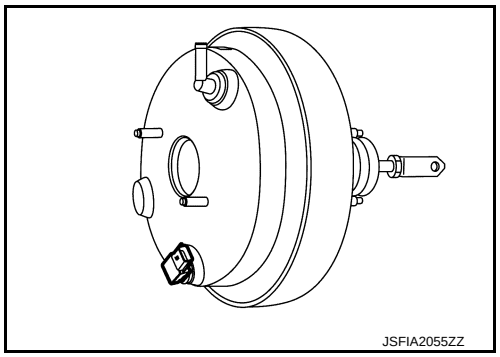
Vacuum Sensor

INFOID:0000000012793718

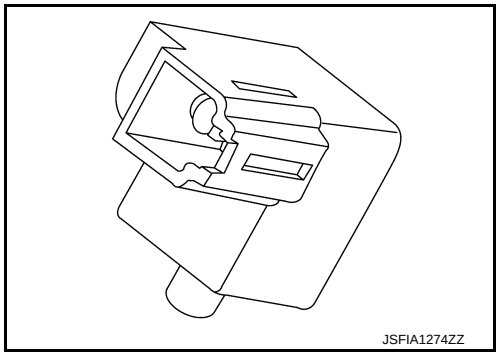
Detects the vacuum in brake booster and transmits converted electric signal to ABS actuator and electric unit (control unit).



Parking Brake Switch

INFOID:0000000012793719

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

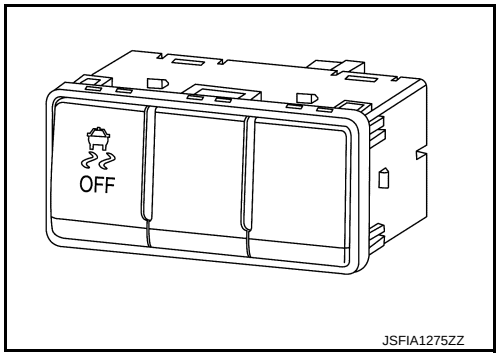
INFOID:0000000012793720

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

- VDC function
- TCS function
- Active trace control function

NOTE:
ABS function, EBD function and Brake limited slip differential (BLSD) function control operates.

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



SYSTEM

System Description

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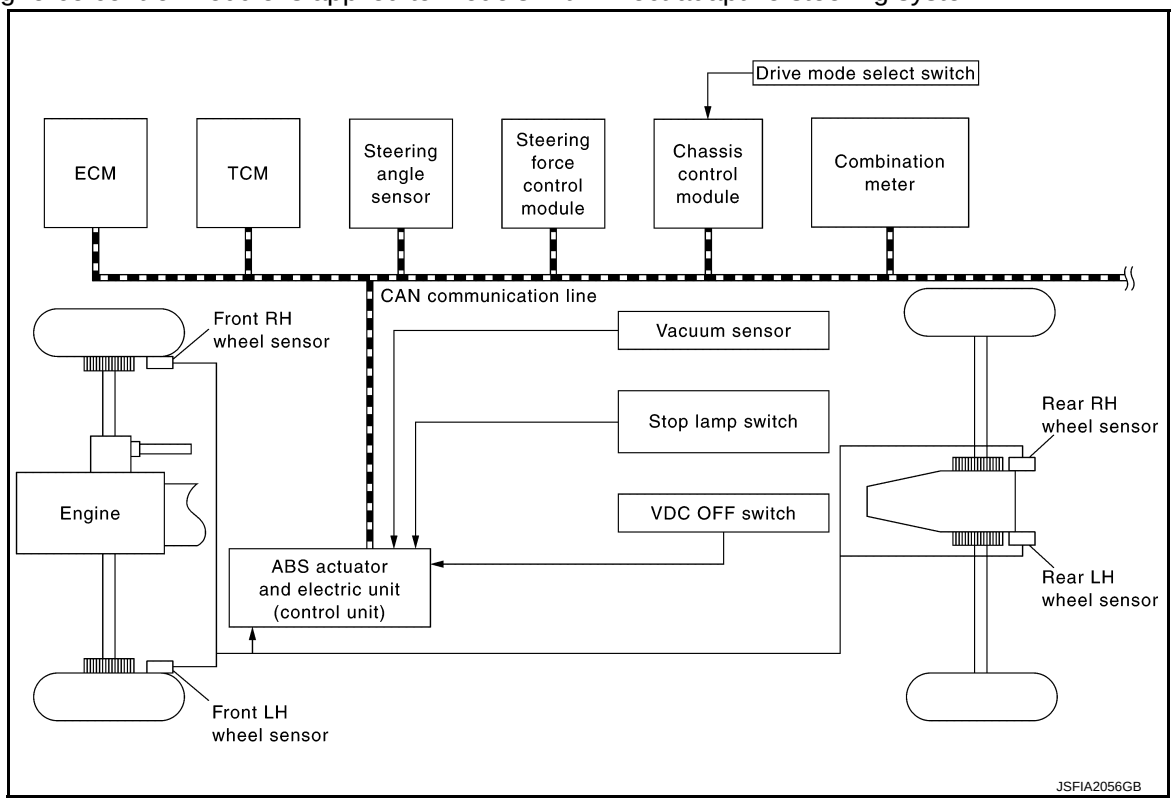
- The system switches fluid pressure of each brake caliper to increase, to hold or to decrease according to signals from control unit in ABS actuator and electric unit (control unit). This control system is applied to VDC function, TCS function, ABS function, EBD function, brake limited slip differential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

SYSTEM DIAGRAM (FOR VR30DDTT ENGINE MODELS)

NOTE:
Steering force control module is applied to models with Direct adaptive steering system.



INPUT SIGNAL AND OUTPUT SIGNAL (FOR VR30DDTT ENGINE MODELS)

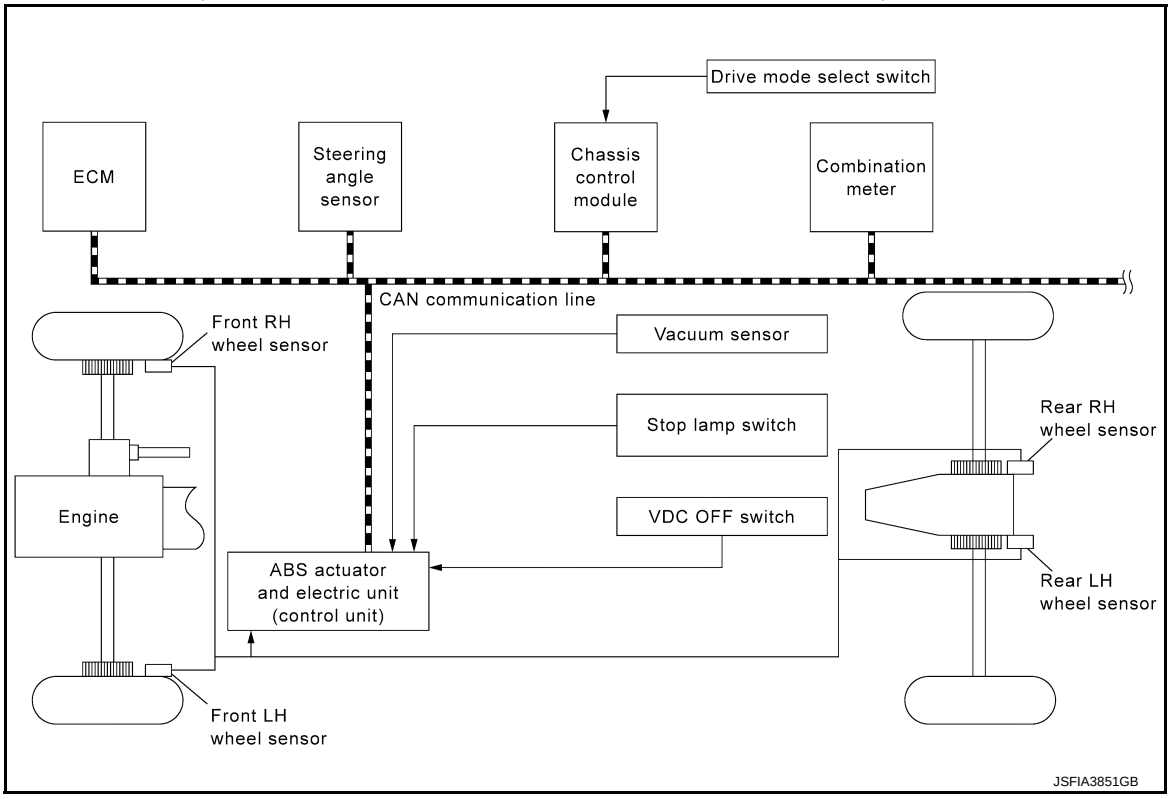
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
Steering force control module*	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering pinion angle signal • Direct adaptive steering malfunction 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 • Engine torque signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Current gear position signal

Component	Signal description
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake warning lamp signal • ABS warning lamp signal • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal • Steering angle sensor malfunction signal

*: Models with Direct adaptive steering system.

SYSTEM DIAGRAM (FOR 2.0L TURBO GASOLINE ENGINE MODELS)



INPUT SIGNAL AND OUTPUT SIGNAL (FOR 2.0L TURBO GASOLINE ENGINE MODELS)

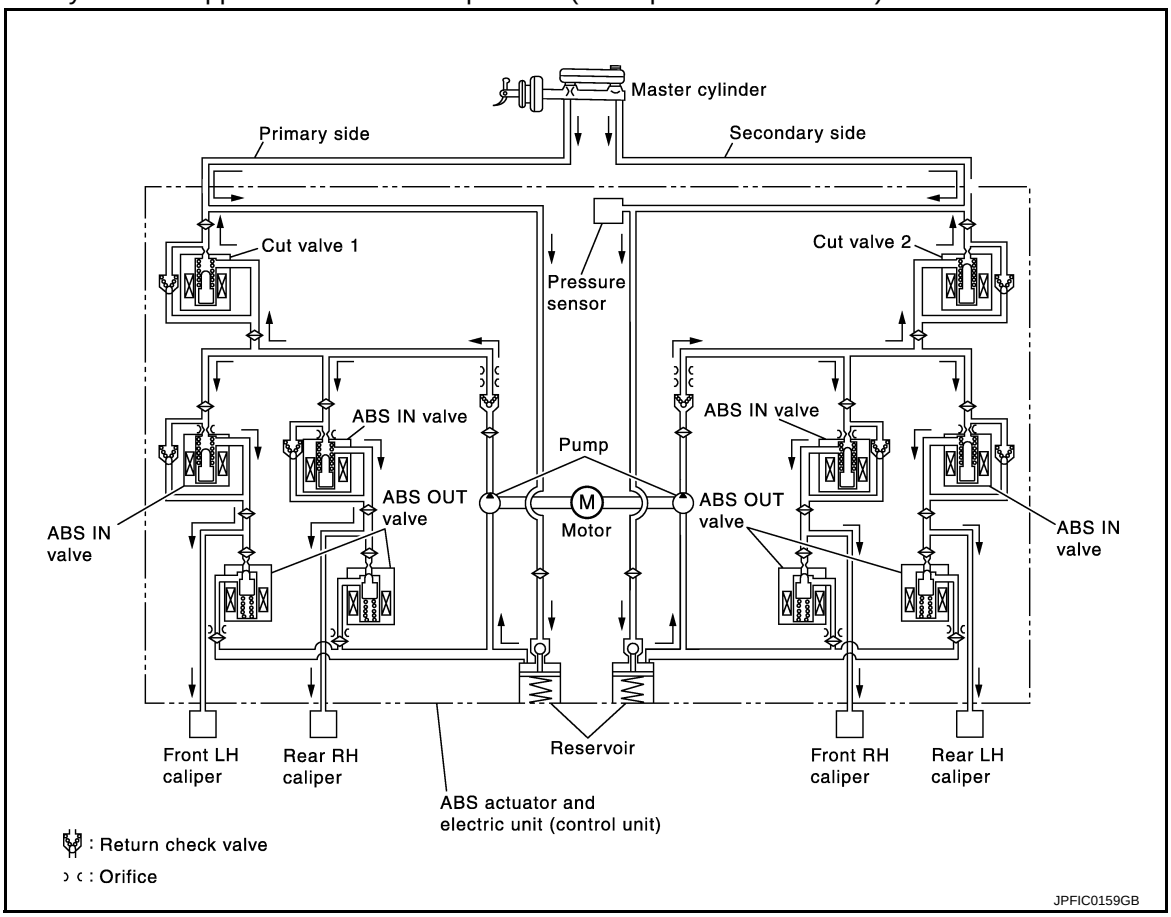
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine torque signal • Engine speed signal • Current gear position signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake warning lamp signal • ABS warning lamp signal • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal • Steering angle sensor malfunction signal

VALVE OPERATION (ABS AND EBD)

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

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



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

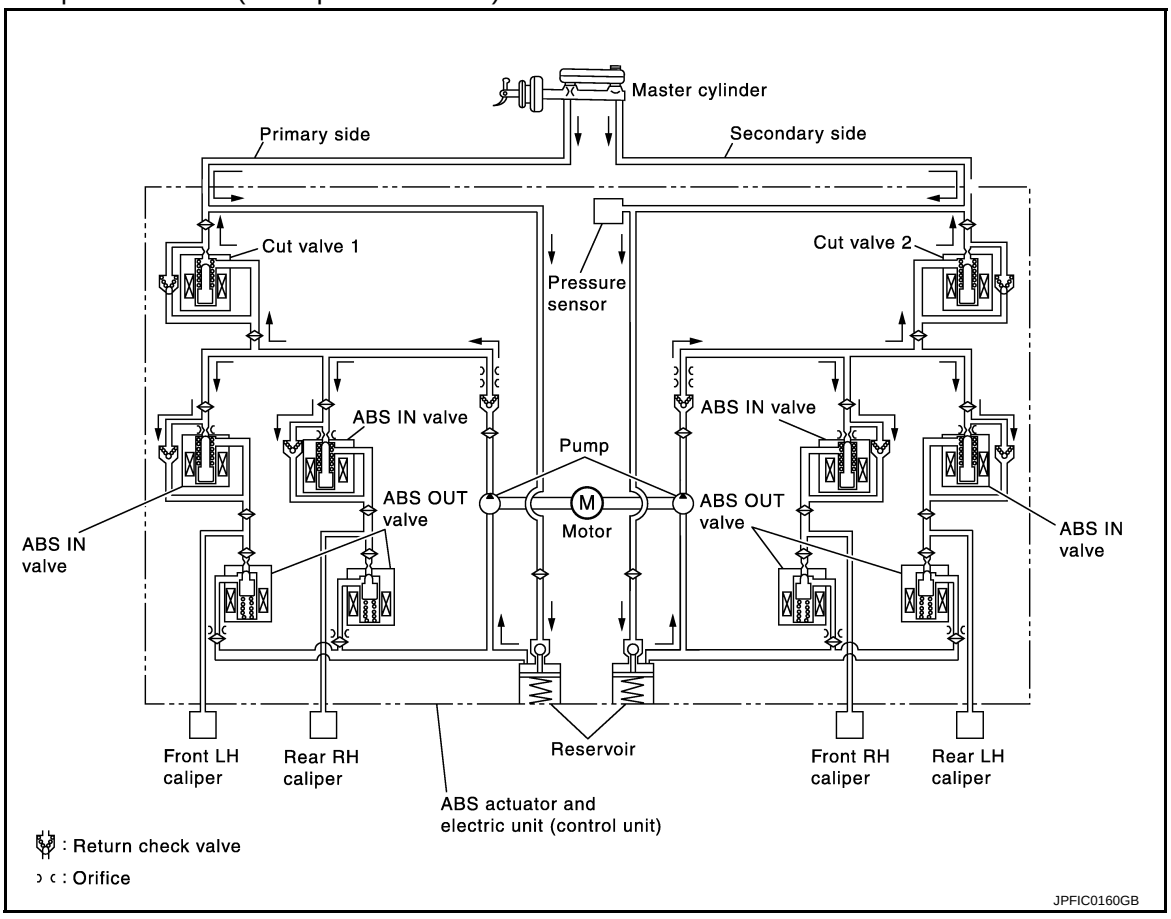
When front RH wheel caliper pressure increases
- Motor is activated. Brake fluid is pressurized by pump and is sent to secondary line through cut valve 2. At the same time, pressurized brake fluid is supplied to front RH caliper through ABS IN valve.

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

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

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

When ABS operation starts (when pressure holds)



Name	Not activated	When pressure holds
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)

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

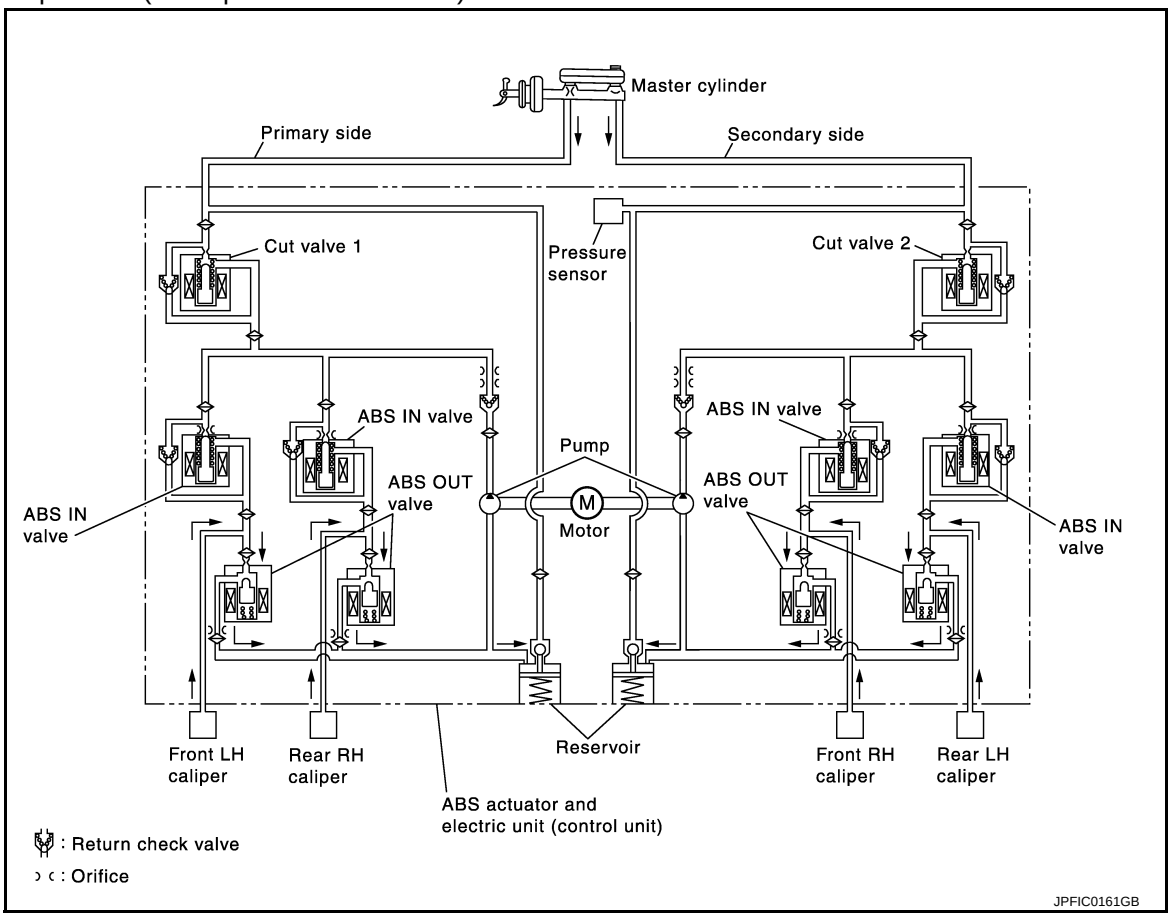
When front RH wheel caliper pressure holds
- Motor is activated. Brake fluid is pressurized by pump and is sent to secondary line through cut valve 2. At the same time, because ABS IN valve and ABS OUT vale are closed, fluid pressure holds.

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

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

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

ABS is in operation (when pressure decreases)



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

When front RH wheel caliper pressure decreases
• Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When front LH wheel caliper pressure decreases
• Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When rear RH wheel caliper pressure decreases
• Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When rear LH wheel caliper pressure decreases
• Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

Component Parts and Function

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

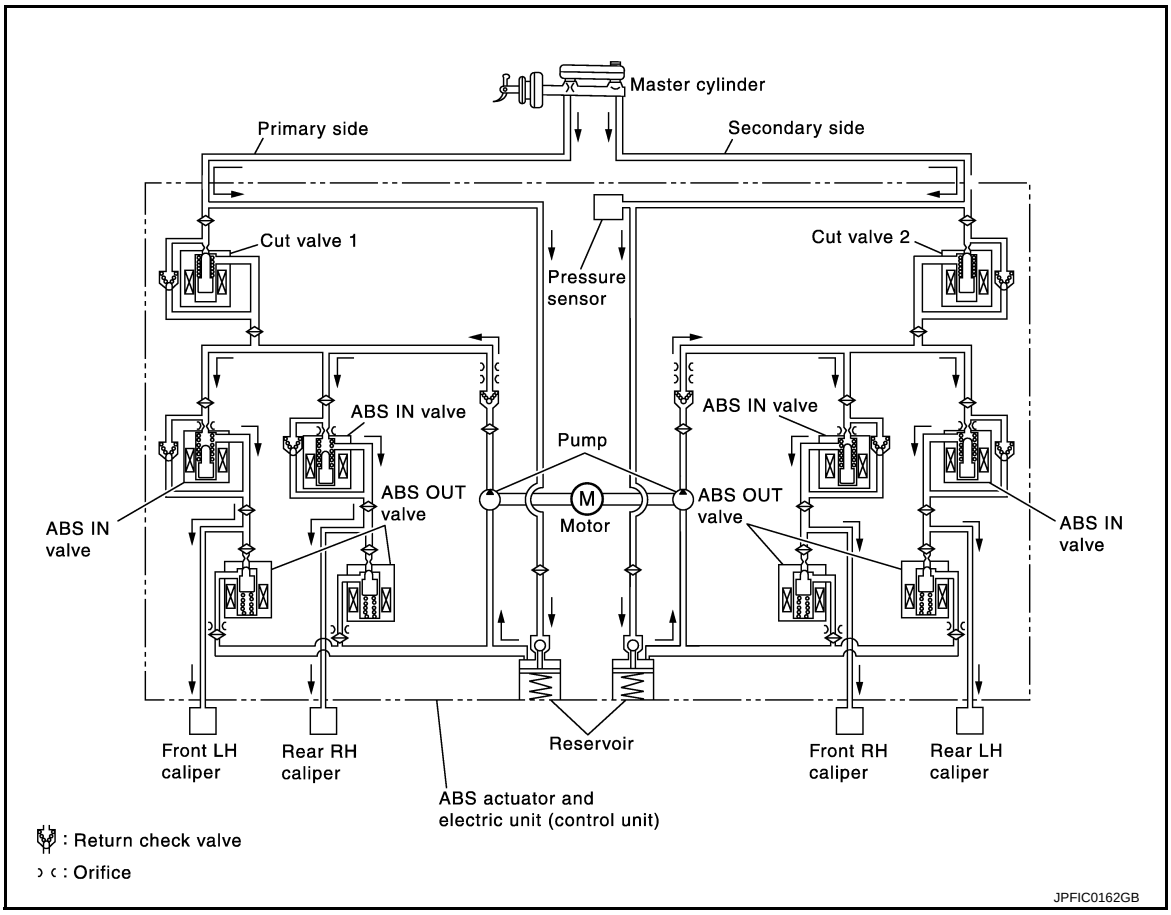
VALVE OPERATION (OTHER THAN ABS AND EBD)

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

NOTE:

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

When Pressure Increases



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

When front RH wheel caliper pressure increases

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

When front LH wheel caliper pressure increases

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

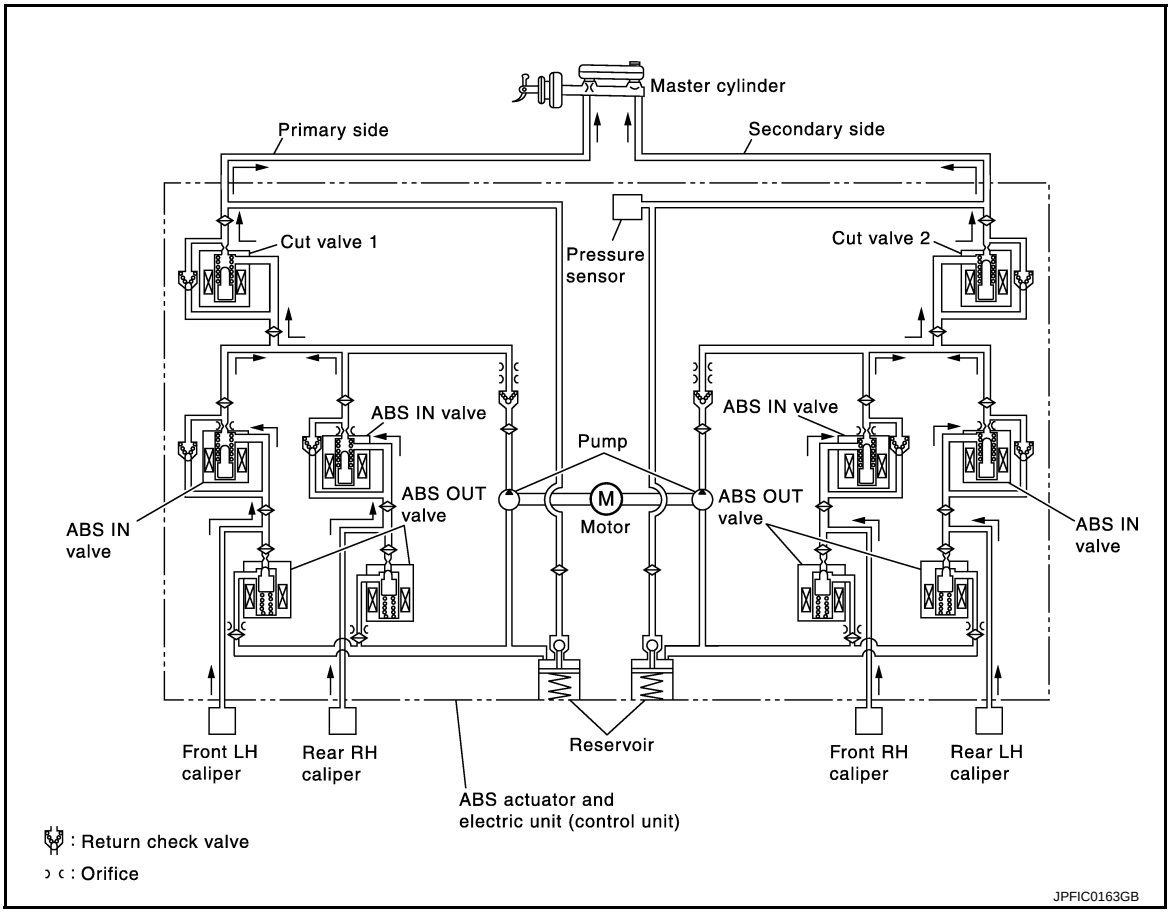
When rear RH wheel caliper pressure increases

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

When rear LH wheel caliper pressure increases

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

Released



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

When front RH wheel caliper pressure decreases

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

When front LH wheel caliper pressure decreases

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

When rear RH wheel caliper pressure decreases

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

When rear LH wheel caliper pressure decreases

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

Component Parts and Function

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

CONDITION FOR TURN ON THE WARNING LAMP

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

Condition (status)	ABS warning lamp	Brake warning lamp	VDC warning lamp
Ignition switch OFF.	OFF	OFF	OFF
For approx. 1 seconds after the ignition switch is turned ON	ON	ON	ON
Approx. 1 seconds after ignition switch is turned ON (when the system is in normal operation).	OFF	OFF	OFF
After engine starts	OFF	OFF	OFF
When brake fluid is less than the specified level (brake fluid level switch ON)	OFF	ON	OFF
When parking brake operates (parking brake switch ON)	OFF	ON	OFF
VDC function is malfunctioning	OFF	OFF	ON
TCS function is malfunctioning	OFF	OFF	ON
ABS function is malfunctioning	ON	OFF	ON
EBD function is malfunctioning	ON	ON	ON
Brake limited slip differential (BLSD) function is malfunctioning	OFF	OFF	ON
Brake assist function is malfunctioning	OFF	OFF	ON
hill start assist function is malfunctioning	OFF	OFF	ON
Brake force distribution function is malfunctioning	OFF	OFF	ON
When brake booster vacuum decreases	OFF	ON	OFF
When vacuum sensor is malfunctioning	OFF	ON	OFF
VDC function is operating	OFF	OFF	Blinking
TCS function is operating	OFF	OFF	Blinking
ABS function is operating	OFF	OFF	OFF
EBD function is operating	OFF	OFF	OFF
Brake limited slip differential (BLSD) function is operating	OFF	OFF	Blinking
Brake assist function is operating	OFF	OFF	OFF
hill start assist function is operating	OFF	OFF	OFF

CONDITION FOR TURN ON THE INDICATOR LAMP

VDC OFF indicator lamp

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

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

Circuit Diagram

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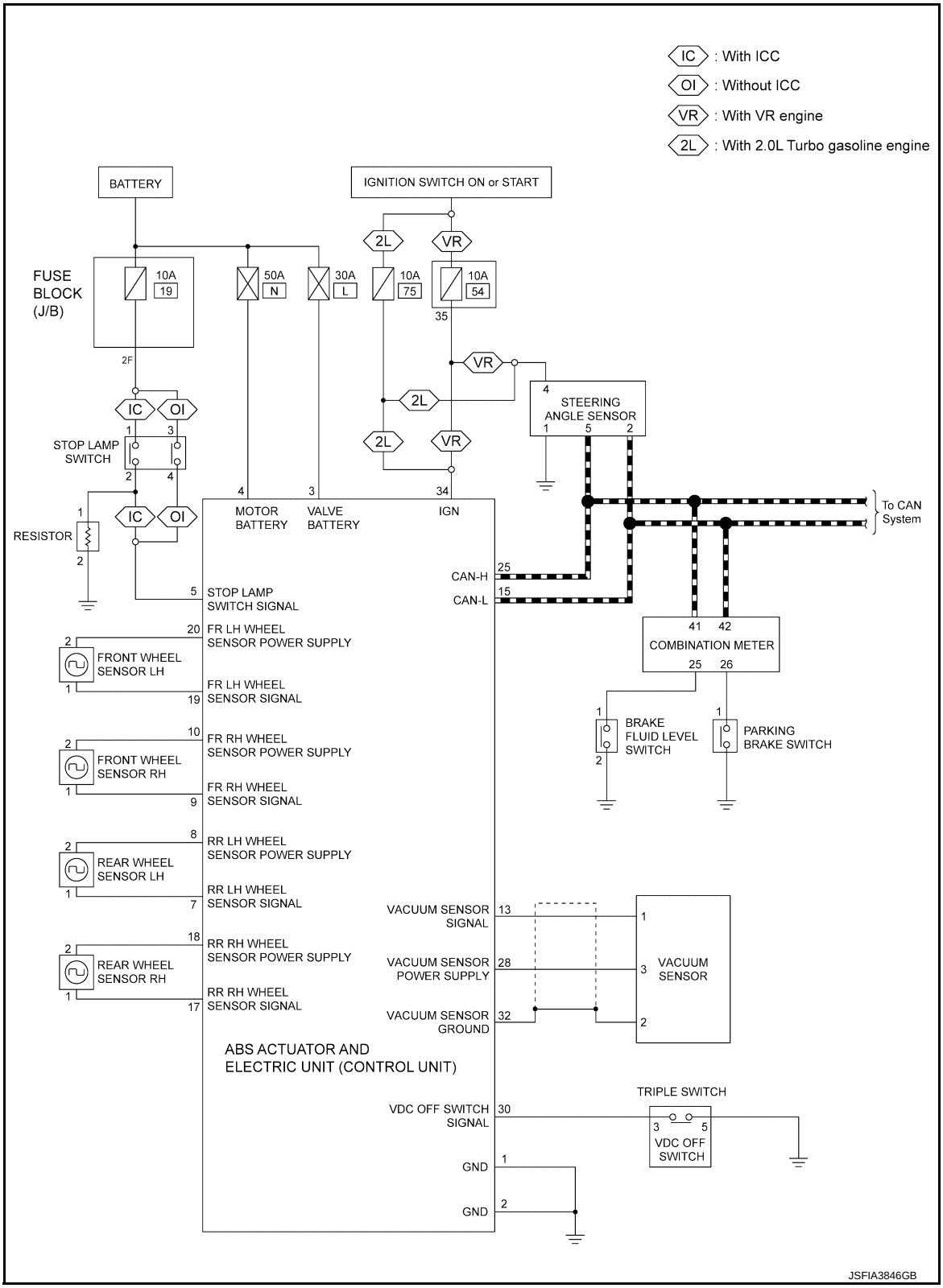
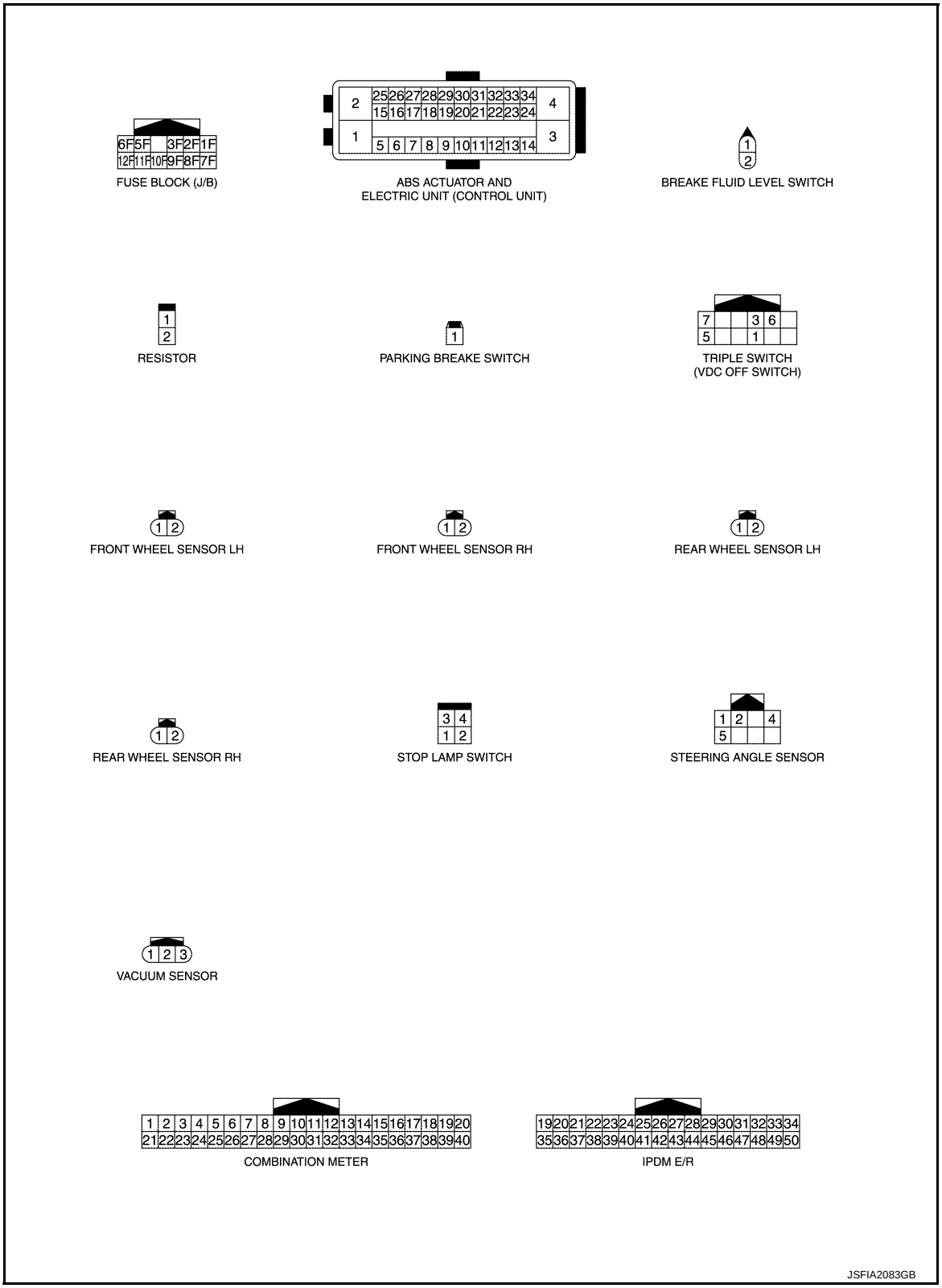




Fail-Safe

INFOID:0000000012793723

VDC FUNCTION, TCS FUNCTION, BRAKE LIMITED SLIP DIFFERENTIAL FUNCTION, BRAKE ASSIST FUNCTION, hill start assist FUNCTION AND BRAKE FORCE DISTRIBUTION FUNCTION

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

(BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. However, ABS function and EBD function are operated normally.

ABS FUNCTION

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

NOTE:

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

EBD FUNCTION

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

DTC	Fail-safe condition
C1101 C1102 C1103 C1104 C1105 C1106 C1107 C1108	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function (only when both 2 rear wheels are malfunctioning) • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1109 C1111	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1115 C1116	The following functions are suspended. • VDC function • TCS function • ABS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)

DTC	Fail-safe condition
C1120 C1121 C1122 C1123 C1124 C1125 C1126 C1127	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1130 C1138	The following functions are suspended. • VDC function • TCS function • Brake limited slip differential (BLSD) function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1140	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1142	The following functions are suspended. • VDC function • TCS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1143 C1144	The following functions are suspended. • VDC function • TCS function • Brake limited slip differential (BLSD) function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1145 C1146	The following functions are suspended. • VDC function • TCS function • ABS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1155	The following functions are suspended. • VDC function • TCS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)

DTC	Fail-safe condition
C1160	The following functions are suspended. • VDC function • TCS function • ABS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1164	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1165	
C1170	The following functions are suspended. • VDC function • TCS function • ABS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1197	Electrical vacuum assistance of brake booster is suspended.
C1198	
C1199	—
C119A	Electrical vacuum assistance of brake booster is suspended.
U1000	The following functions are suspended. • VDC function • TCS function • Brake limited slip differential (BLSD) function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)

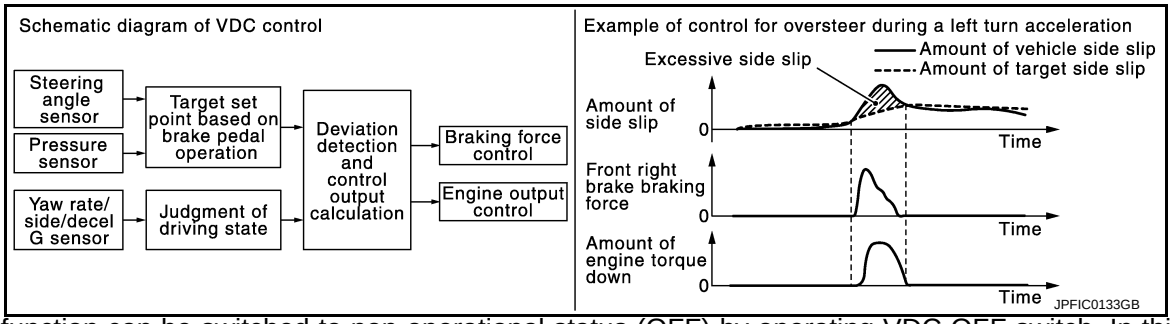
VDC FUNCTION

VDC FUNCTION : System Description

INFOID:0000000012793724

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

steer) are judged and vehicle stability is improved by brake force control on all 4 wheels and engine output control.



- VDC function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as engine output control, by transmitting drive signal to actuator portion according to difference between target side slip amount and vehicle side slip amount
- VDC warning lamp blinks while VDC function is in operation and indicates to the driver that the function is in operation.
- Switching modes with drive mode selector allows the adjustment of VDC/TCS control timing/amount to enable the vehicle control (e.g. acceleration and turning) just as intended by the driver (sport+).* Refer to DMS-15, "Infiniti Drive Mode Selector : System Description (For VR30DDTT Engine Models)"
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in VDC function, the control is suspended for VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. However, ABS function and EBD function are operated normally. Refer to BRC-29, "Fail-Safe".

NOTE:

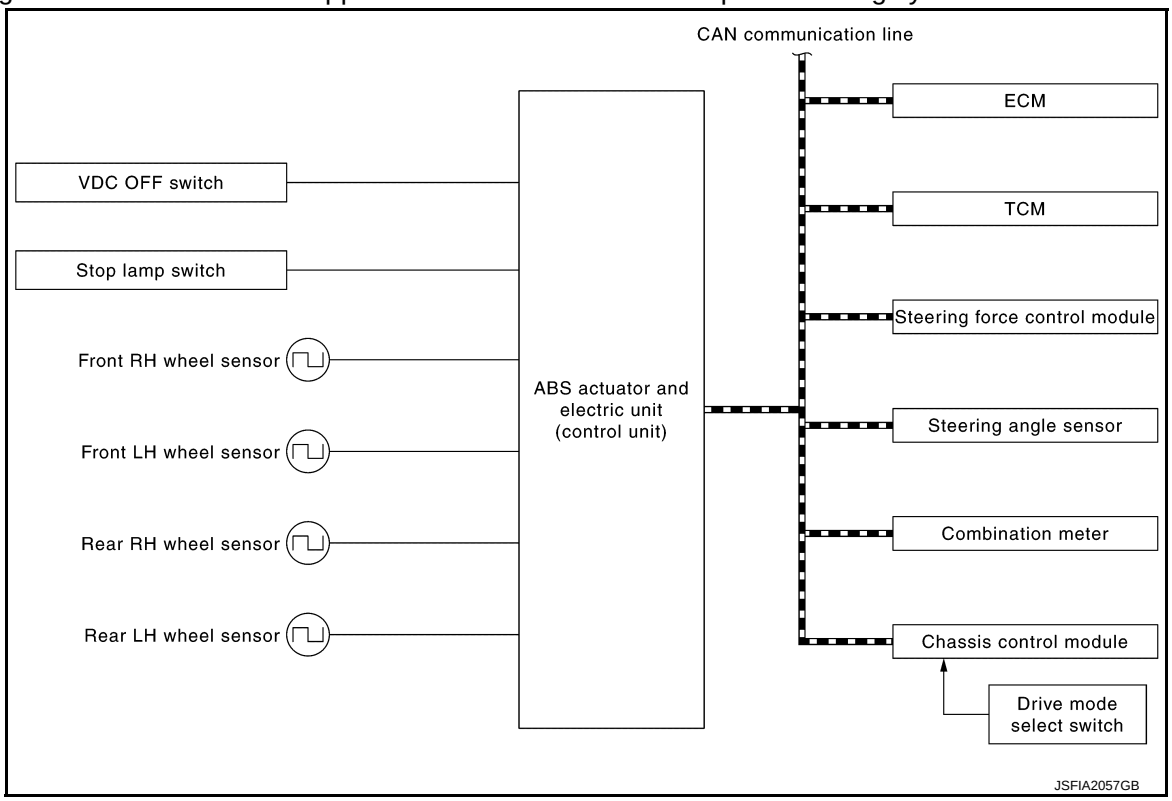
VDC has the characteristic as described here, This is not the device that helps reckless driving.

*: VR30DDTT engine models

SYSTEM DIAGRAM (FOR VR30DDTT ENGINE MODELS)

NOTE:

Steering force control module is applied to models with Direct adaptive steering system.



INPUT SIGNAL AND OUTPUT SIGNAL (FOR VR30DDTT ENGINE MODELS)

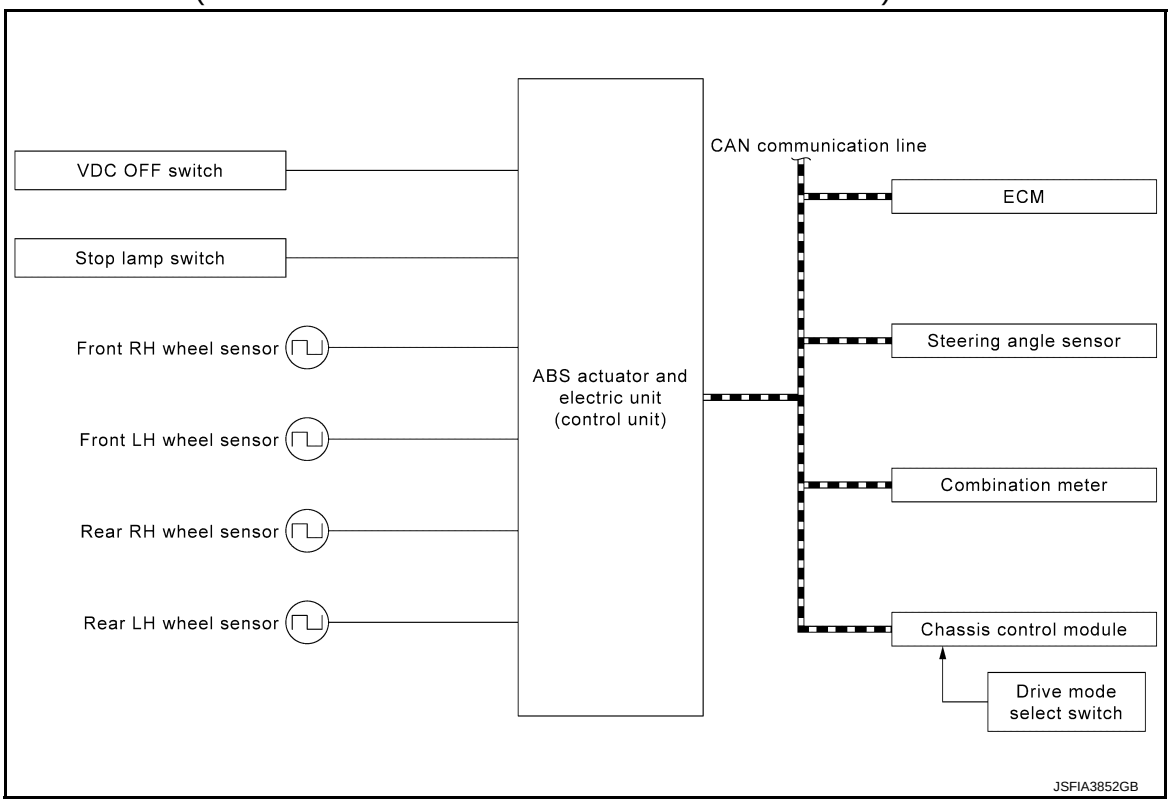
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
Steering force control module*	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering pinion angle signal • Direct adaptive steering malfunction 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 • Engine torque signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Current gear position signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal

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

*: Models with Direct adaptive steering system.

SYSTEM DIAGRAM (FOR 2.0L TURBO GASOLINE ENGINE MODELS)



INPUT SIGNAL AND OUTPUT SIGNAL (FOR 2.0L TURBO GASOLINE ENGINE MODELS)

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

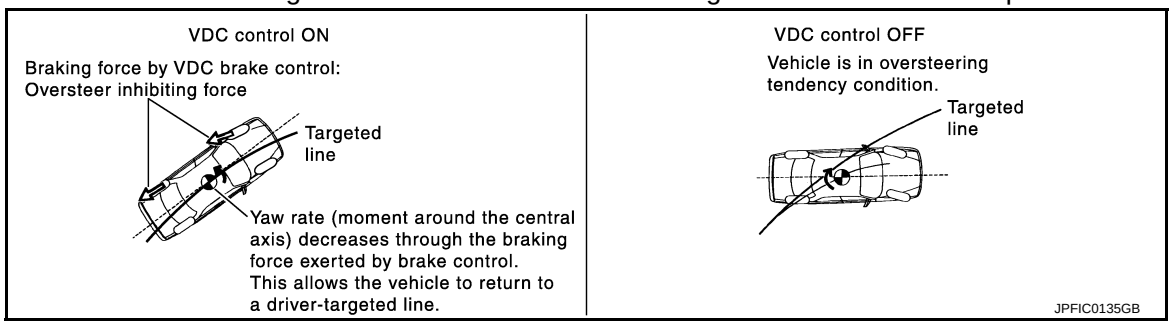
Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine torque signal • Engine speed signal • Current gear position signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal

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

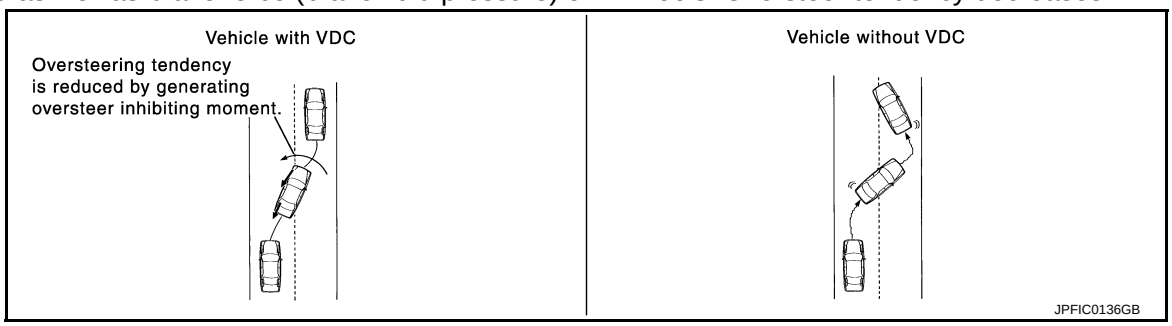
OPERATION CHARACTERISTICS

VDC Function That Prevents Oversteer Tendency

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

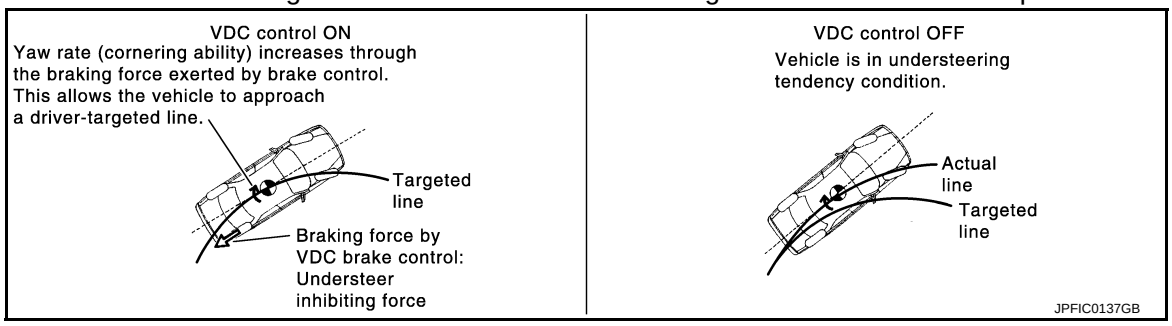


- Changing driving lane on a slippery road, when oversteer tendency is judged large, engine output is controlled as well as brake force (brake fluid pressure) of 4 wheels. Oversteer tendency decreases.

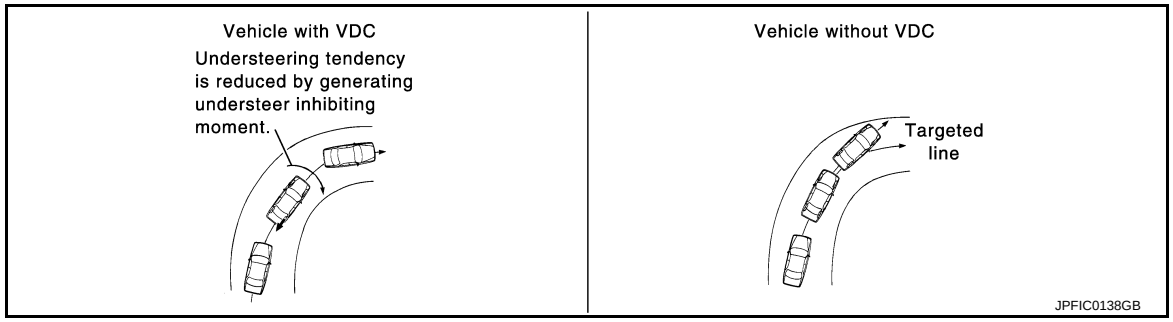


VDC Function That Prevents Understeer Tendency

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



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

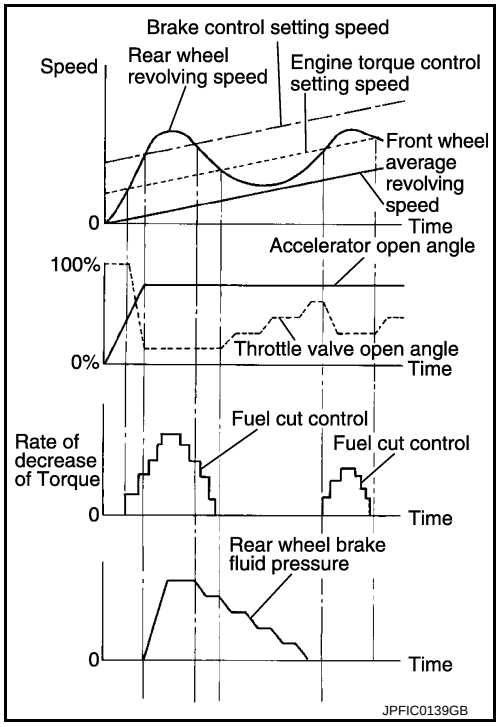


TCS FUNCTION

TCS FUNCTION : System Description

INFOID:0000000012793725

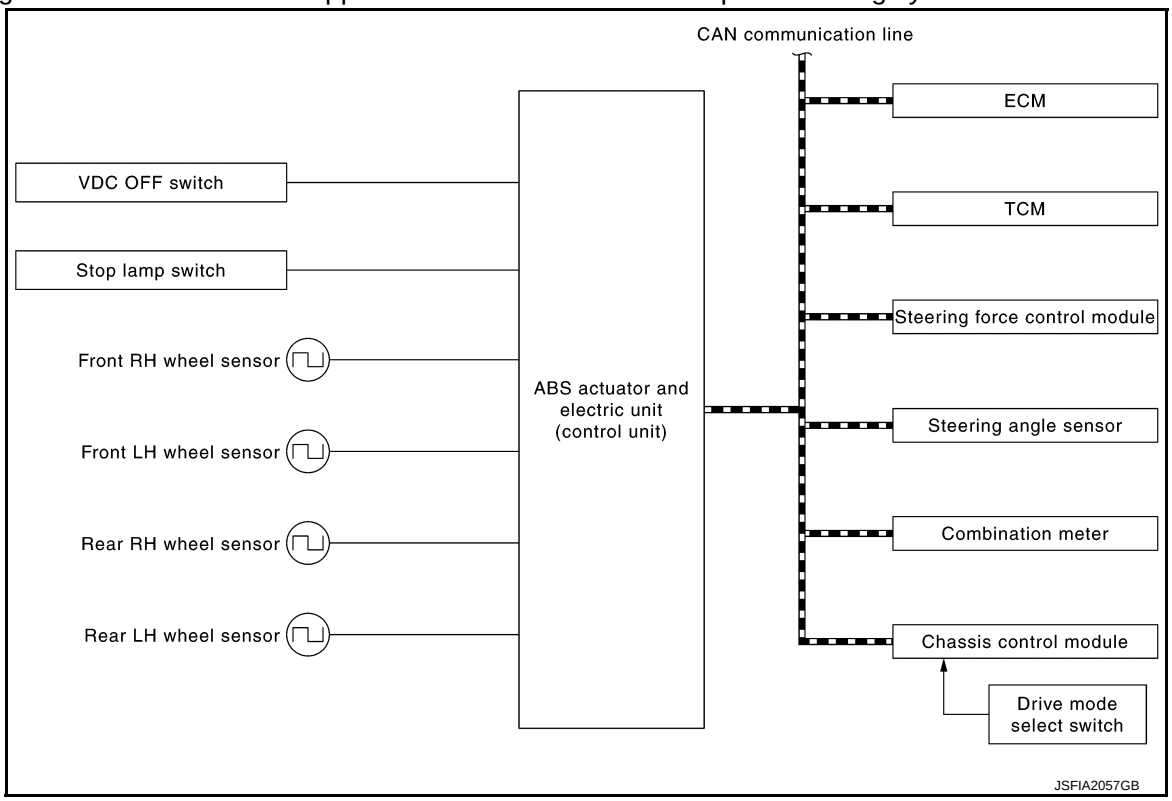
- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Engine output and transmission shift status is controlled so that slip rate of drive wheels is in appropriate level. When wheel spin occurs on drive wheel, ABS actuator and electric unit (control unit) perform brake force control of LH and RH drive wheels (apply brake force by increasing brake fluid pressure of drive wheel) and decrease engine torque by engine torque control. Wheel spin amount decreases. Engine torque is controlled to appropriate level.
- TCS function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- VDC warning lamp blinks while TCS function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function The vehicle status becomes the same as models without VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function However, ABS function and EBD function are operated normally. Refer to BRC-29, "Fail-Safe".



SYSTEM DIAGRAM (FOR VR30DDTT ENGINE MODELS)

NOTE:

Steering force control module is applied to models with Direct adaptive steering system.



INPUT SIGNAL AND OUTPUT SIGNAL (FOR VR30DDTT ENGINE MODELS)

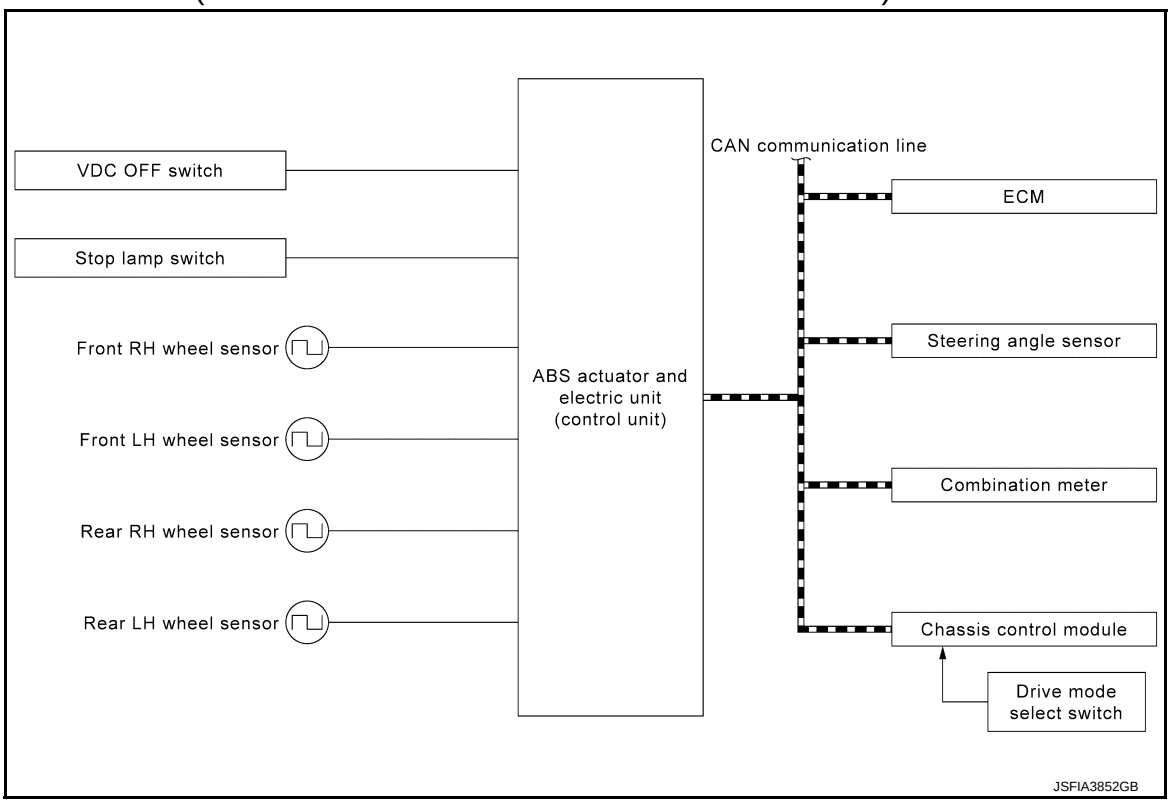
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
Steering force control module*	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering pinion angle signal • Direct adaptive steering malfunction 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 • Engine torque signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Current gear position signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal

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

*: Models with Direct adaptive steering system.

SYSTEM DIAGRAM (FOR 2.0L TURBO GASOLINE ENGINE MODELS)



INPUT SIGNAL AND OUTPUT SIGNAL (FOR 2.0L TURBO GASOLINE ENGINE MODELS)

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

Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine torque signal • Engine speed signal • Current gear position signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal

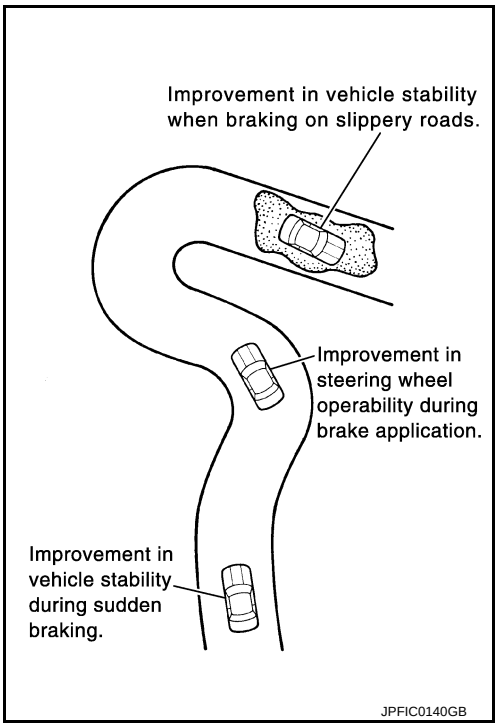
Component	Signal description
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control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

ABS FUNCTION

ABS FUNCTION : System Description

INFOID:0000000012793726

- By preventing wheel lock through brake force (brake fluid pressure) control that is electronically controlled by detecting wheel speed during braking, stability during emergency braking is improved so that obstacles can be easily bypassed by steering operation.
- During braking, control units calculates wheel speed and pseudo-vehicle speed, and transmits pressure increase, hold or decrease signals to actuator portion according to wheel slip status.
- The following effects are obtained by preventing wheel lock during braking.
- Vehicle tail slip is prevented during braking when driving straight.
- Understeer and oversteer tendencies are moderated during braking driving on a corner.
- Obstacles may be easily bypassed by steering operation during braking.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for VDC function, TCS function, ABS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. However, EBD function is operated normally. Refer to BRC-29, "Fail-Safe".



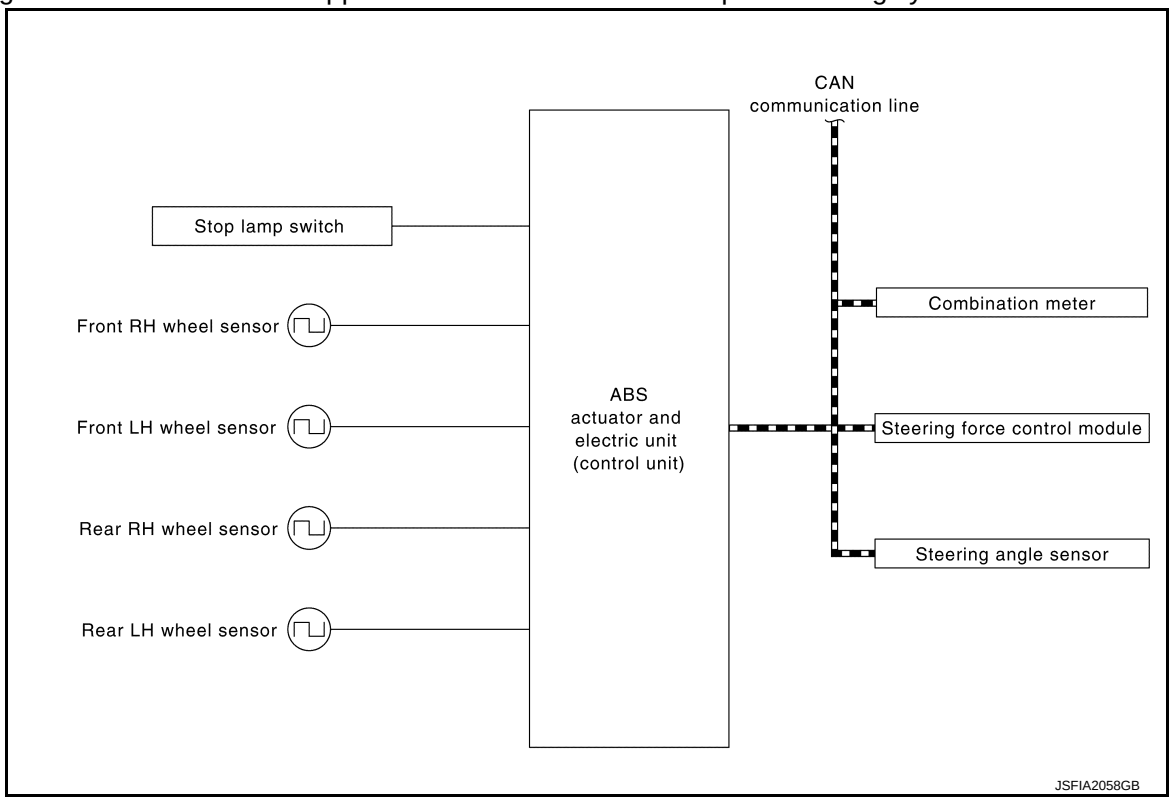
NOTE:

- ABS has the characteristic as described here, This is not the device that helps reckless driving.
- To stop vehicle efficiently, ABS does not operate and ordinary brake operates at low speed [approx. 10 km/h (6 MPH) or less, but differs subject to road conditions).
- Self-diagnosis is performed immediately after when engine starts and when vehicle initially is driven [by vehicle speed approx. 15 km/h (9 MPH)]. Motor sounds are generated during self-diagnosis. In addition, brake pedal may be felt heavy when depressing brake pedal lightly. These symptoms are not malfunctions.

SYSTEM DIAGRAM (FOR VR30DDTT ENGINE MODELS)

NOTE:

Steering force control module is applied to models with Direct adaptive steering system.



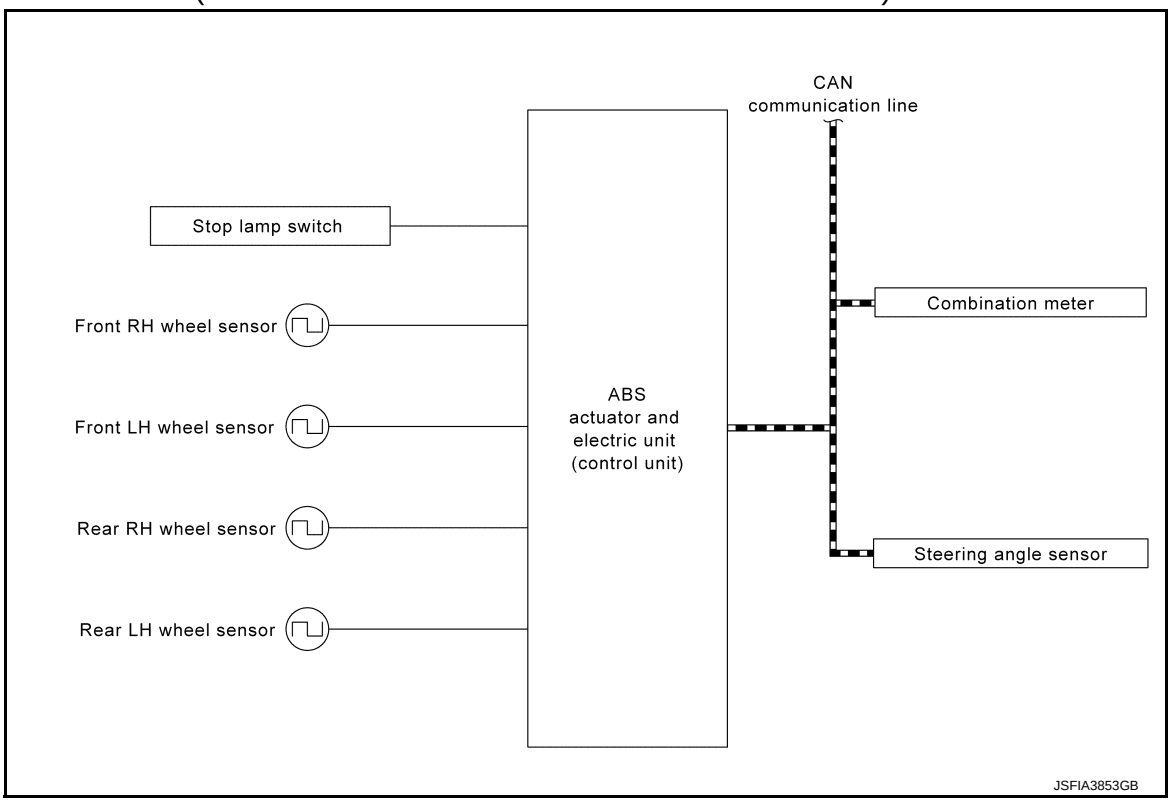
INPUT SIGNAL AND OUTPUT SIGNAL (FOR VR30DDTT ENGINE MODELS)

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

Component	Signal description
Steering force control module*	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering pinion angle signal • Direct adaptive steering malfunction signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • ABS warning lamp signal • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal • Steering angle sensor malfunction signal

*: Models with Direct adaptive steering system.

SYSTEM DIAGRAM (FOR 2.0L TURBO GASOLINE ENGINE MODELS)



INPUT SIGNAL AND OUTPUT SIGNAL (FOR 2.0L TURBO GASOLINE ENGINE MODELS)

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 fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • ABS warning lamp signal • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal • Steering angle sensor malfunction signal

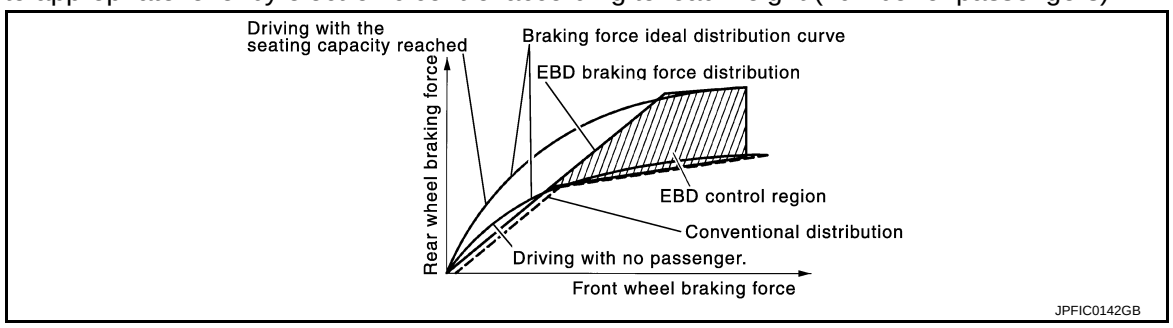
EBD FUNCTION

EBD FUNCTION : System Description

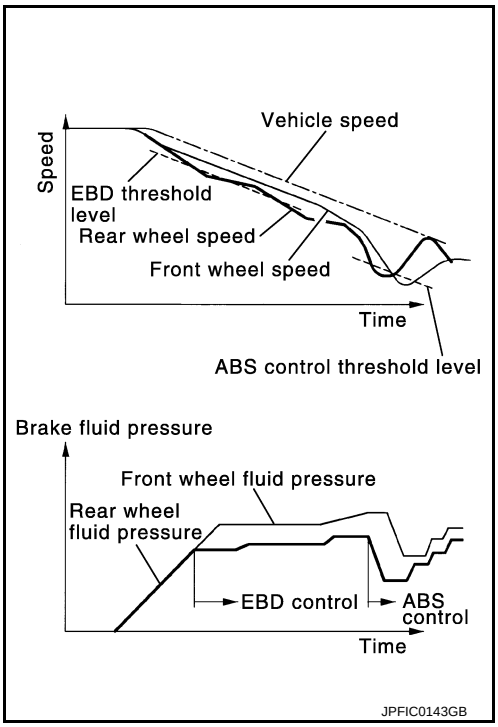
INFOID:0000000012793727

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

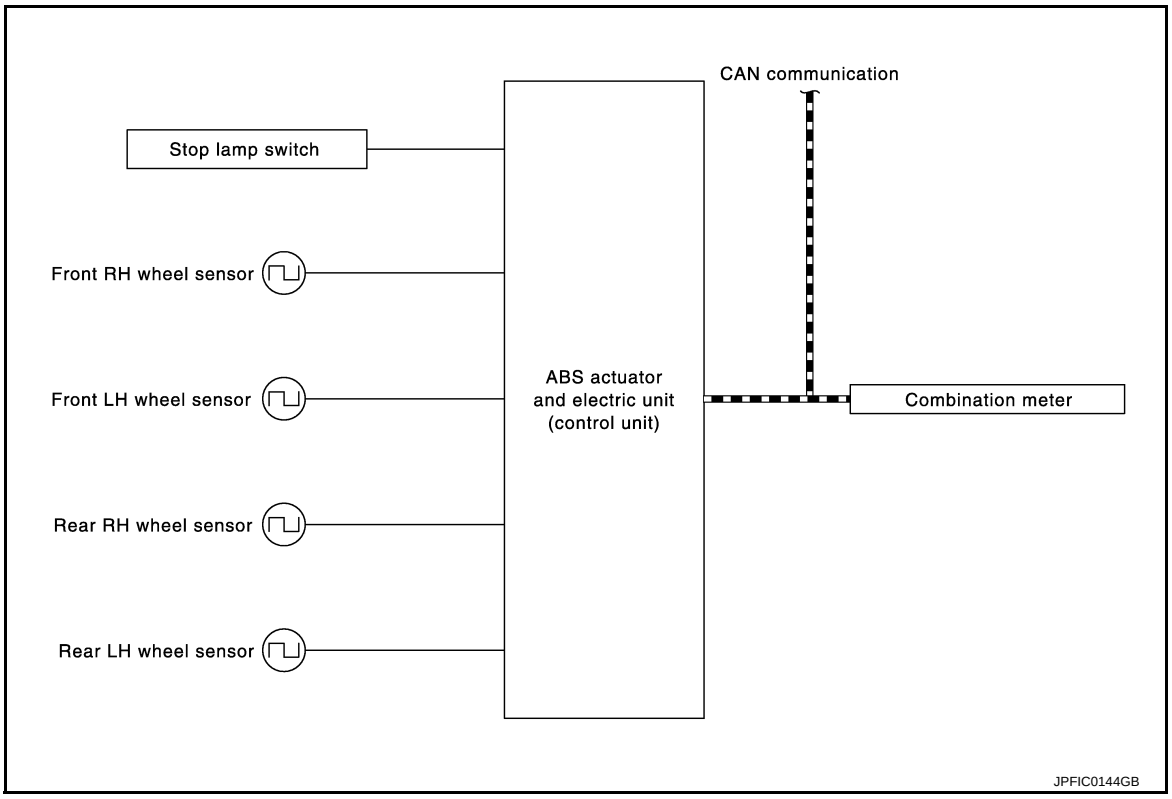
- EBD function is expanded and developed from conventional ABS function and corrects rear wheel brake force to appropriate level by electronic control according to load weight (number of passengers).



- During braking, control unit portion compares slight slip on front and rear wheels by wheel speed sensor signal, transmits drive signal to actuator portion when rear wheel slip exceeds front wheel slip for the specified value or more, and controls rear wheel brake force (brake fluid pressure) so that increase of rear wheel slip is prevented and slips on front wheel and rear wheel are nearly equalized. ABS control is applied when slip on each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. Refer to BRC-29, "Fail-Safe".



SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

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

BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION

BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION : System Description

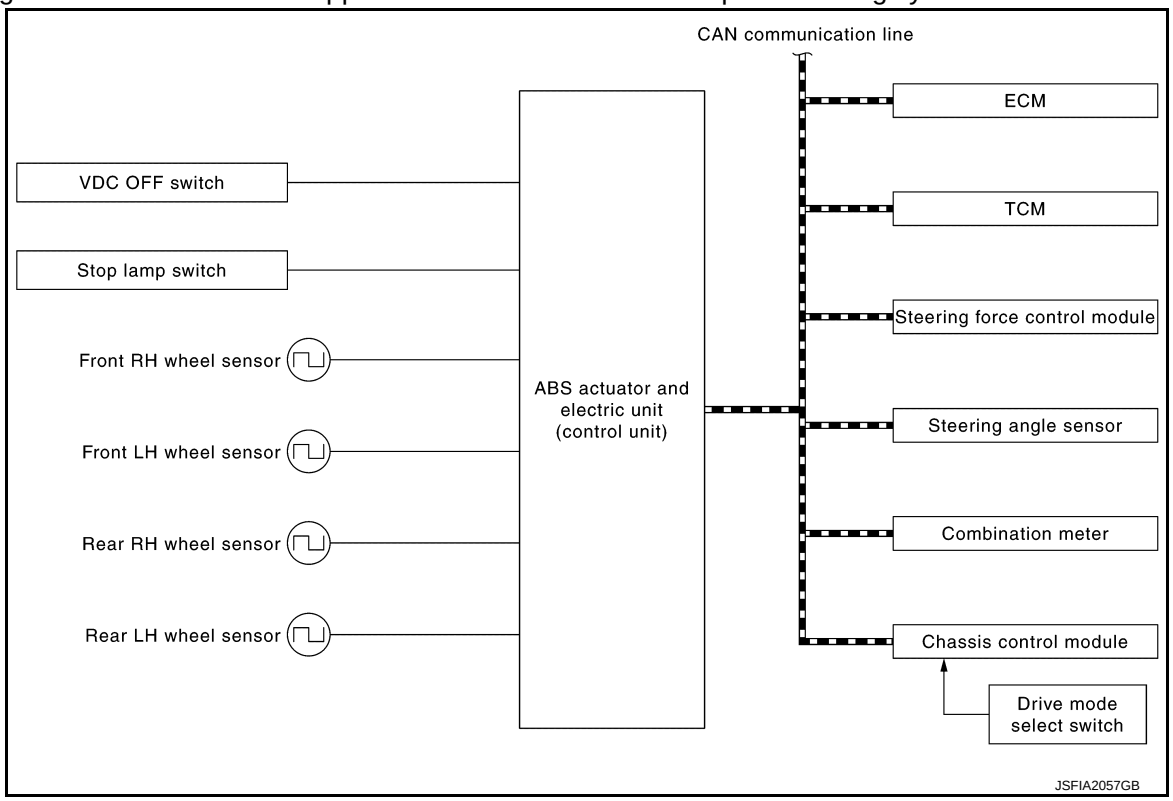
INFOID:0000000012793728

- LH and RH driving wheel spin is always monitored. If necessary, appropriate brake force is independently applied to LH or RH driving wheel so that one-sided wheel spin is avoided and traction is maintained. Mainly starting ability is improved.
- Brake limited slip differential (BLSD) function operates while VDC function is in non-operational status (OFF) by VDC OFF switch.
- VDC warning lamp blinking while Brake limited slip differential (BLSD) function is in operation and indicates to the driver that the function is in operation.
- Slight vibrations are felt on the Brake pedal and the operation noises occur, when Brake limited slip differential (BLSD) function operates. This is not a malfunction because it is caused by Brake limited slip differential (BLSD) function that is normally operated.
- Fail-safe function is adopted. When a malfunction occurs in brake limited slip differential (BLSD) function, the control is suspended for VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. However, ABS function and EBD function are operated normally. Refer to BRC-29, "Fail-Safe".

SYSTEM DIAGRAM (FOR VR30DDTT ENGINE MODELS)

NOTE:

Steering force control module is applied to models with Direct adaptive steering system.



INPUT SIGNAL AND OUTPUT SIGNAL (FOR VR30DDTT ENGINE MODELS)

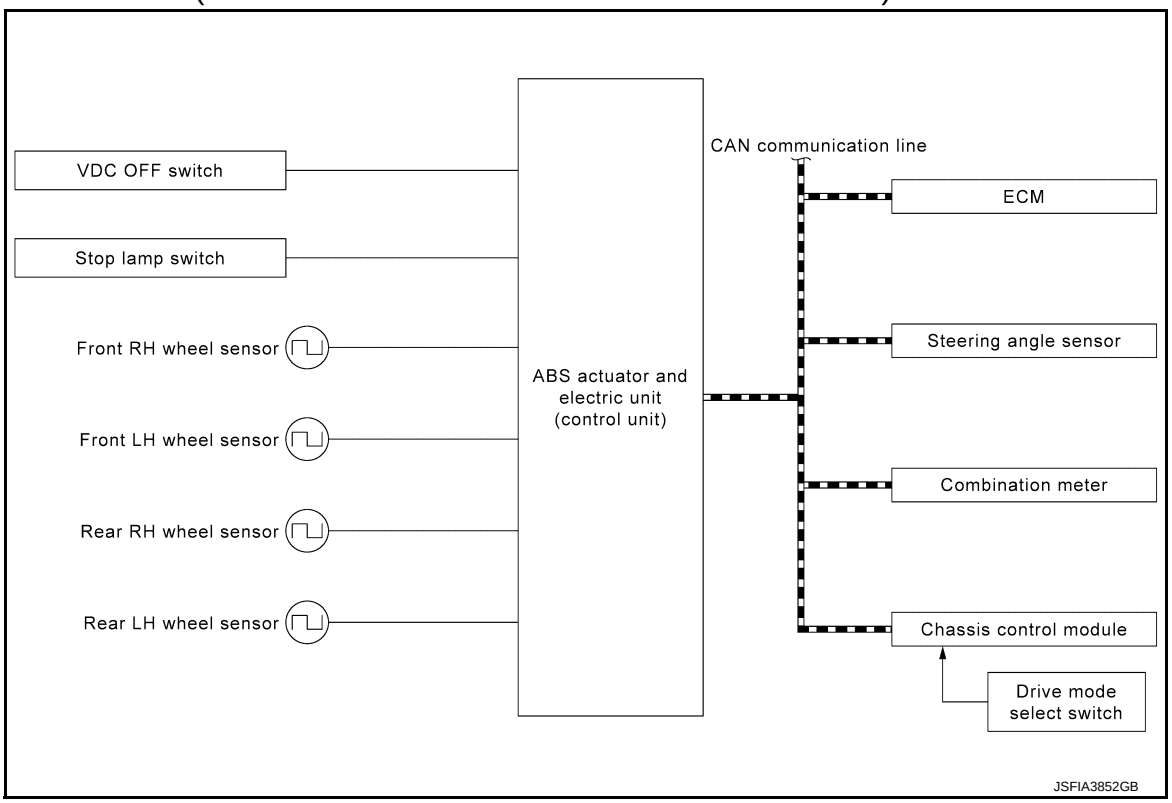
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
Steering force control module*	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering pinion angle signal • Direct adaptive steering malfunction 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 • Engine torque signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Current gear position signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal

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

*: Models with Direct adaptive steering system.

SYSTEM DIAGRAM (FOR 2.0L TURBO GASOLINE ENGINE MODELS)



INPUT SIGNAL AND OUTPUT SIGNAL (FOR 2.0L TURBO GASOLINE ENGINE MODELS)

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

Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine torque signal • Engine speed signal • Current gear position signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal

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

BRAKE ASSIST FUNCTION

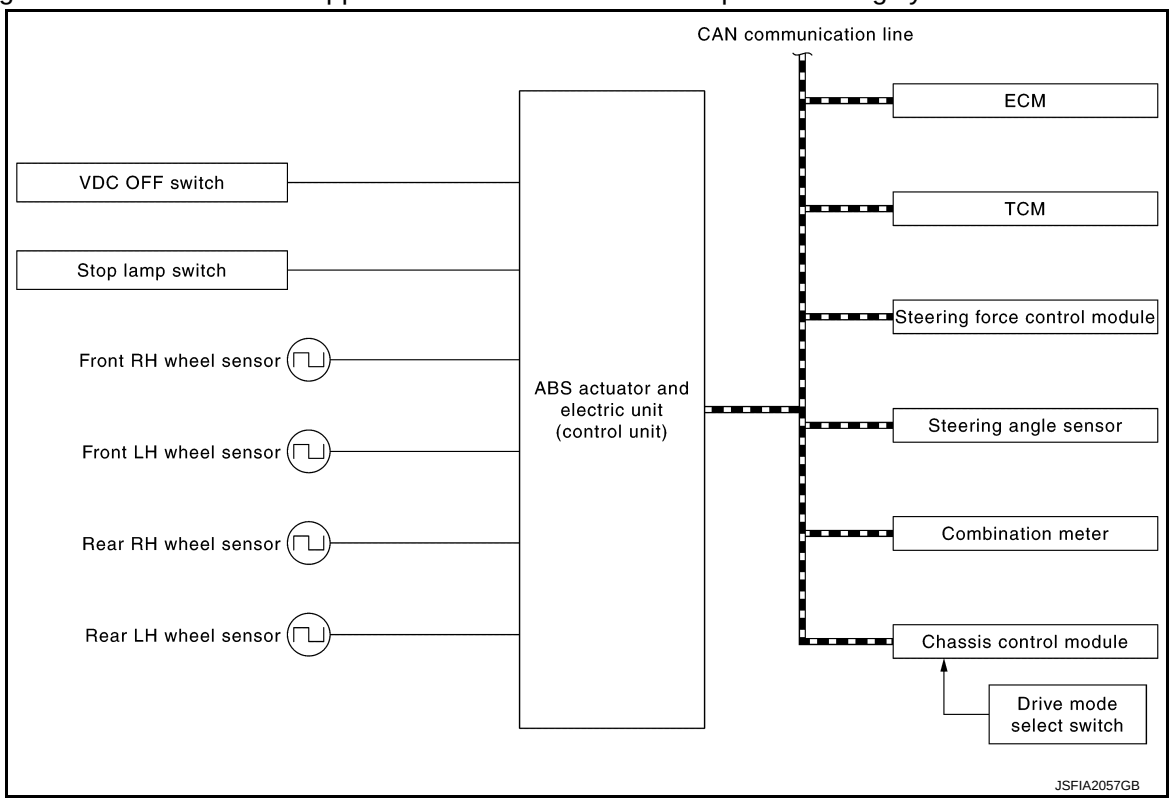
BRAKE ASSIST FUNCTION : System Description

INFOID:0000000012793729

- When the driver brakes hard in an emergency, the stopping distance is reduced by increasing brake fluid pressure.
- Fail-safe function is adopted. When a malfunction occurs in Brake assist function, the control is suspended for VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. However, ABS function and EBD function are operated normally. Refer to BRC-29, "Fail-Safe".

SYSTEM DIAGRAM (FOR VR30DDTT ENGINE MODELS)

NOTE:
Steering force control module is applied to models with Direct adaptive steering system.



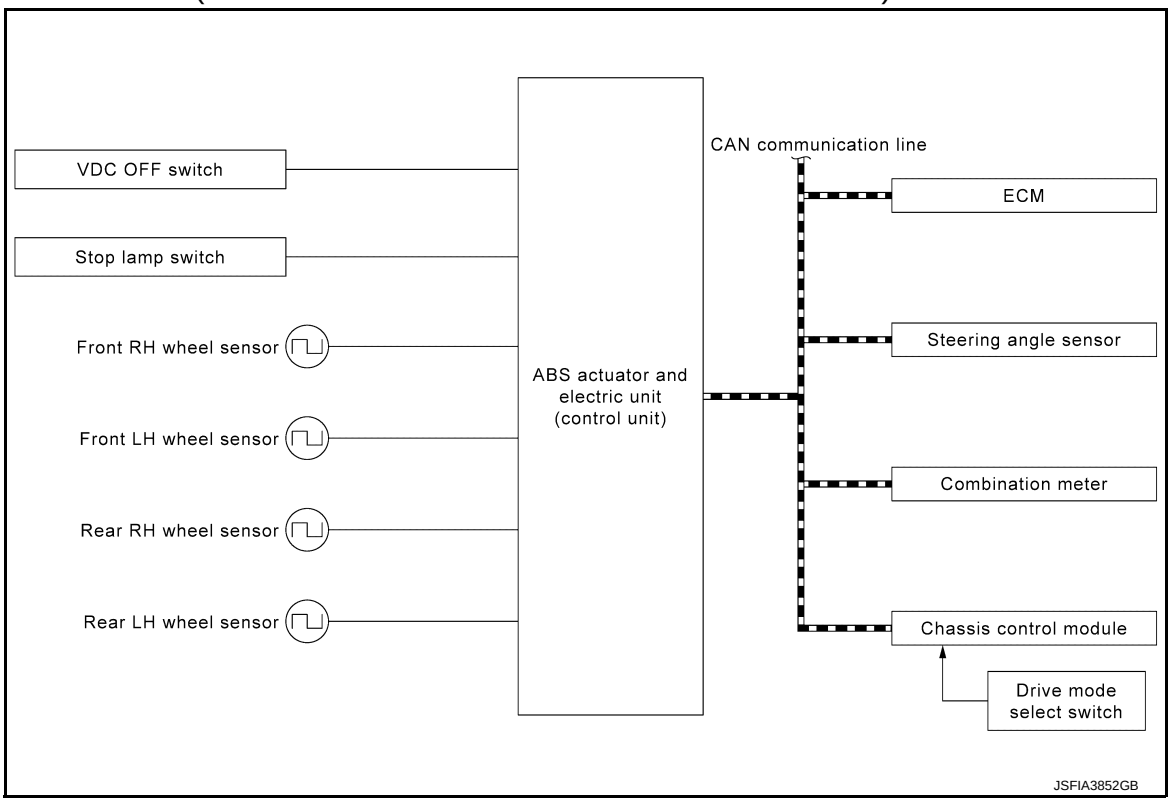
INPUT SIGNAL AND OUTPUT SIGNAL (FOR VR30DDTT ENGINE MODELS)

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

Component	Signal description
Steering force control module*	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering pinion angle signal • Direct adaptive steering malfunction 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 • Engine torque signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Current gear position signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal • Steering angle sensor malfunction signal

*: Models with Direct adaptive steering system.

SYSTEM DIAGRAM (FOR 2.0L TURBO GASOLINE ENGINE MODELS)



INPUT SIGNAL AND OUTPUT SIGNAL (FOR 2.0L TURBO GASOLINE ENGINE MODELS)

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

Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine torque signal • Engine speed signal • Current gear position signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal • Steering angle sensor malfunction signal

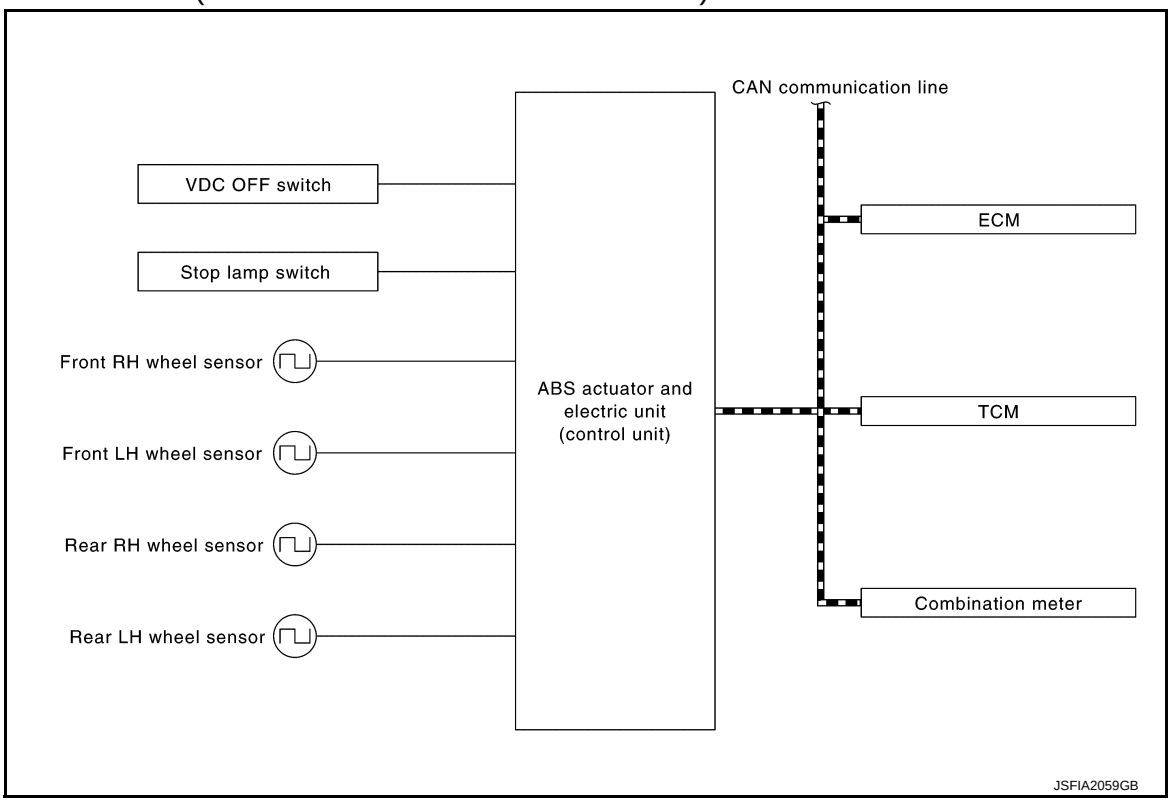
hill start assist FUNCTION

hill start assist FUNCTION : System Description

INFOID:0000000012793730

- This function maintains brake fluid pressure so that the vehicle does not move backwards even if brake pedal is released to depress accelerator pedal to start the vehicle while it is stopped on an uphill slope by depressing brake pedal.
- This function operates when the vehicle is in stop status on a uphill slope of slope ratio 10% or more and selector lever is in the position other than P or N.
- hill start assist function is only for the start aid. It maintains the brake fluid pressure for approx. 2 seconds after releasing the brake pedal, and then decreases the pressure gradually. If the vehicle can start by the accelerator operation, the brake is released automatically and a smooth start can be performed.
- Fail-safe function is adopted. When a malfunction occurs in hill start assist function, the control is suspended for VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. However, ABS function and EBD function are operated normally. Refer to BRC-29, "Fail-Safe".

SYSTEM DIAGRAM (FOR VR30DDTT ENGINE MODELS)

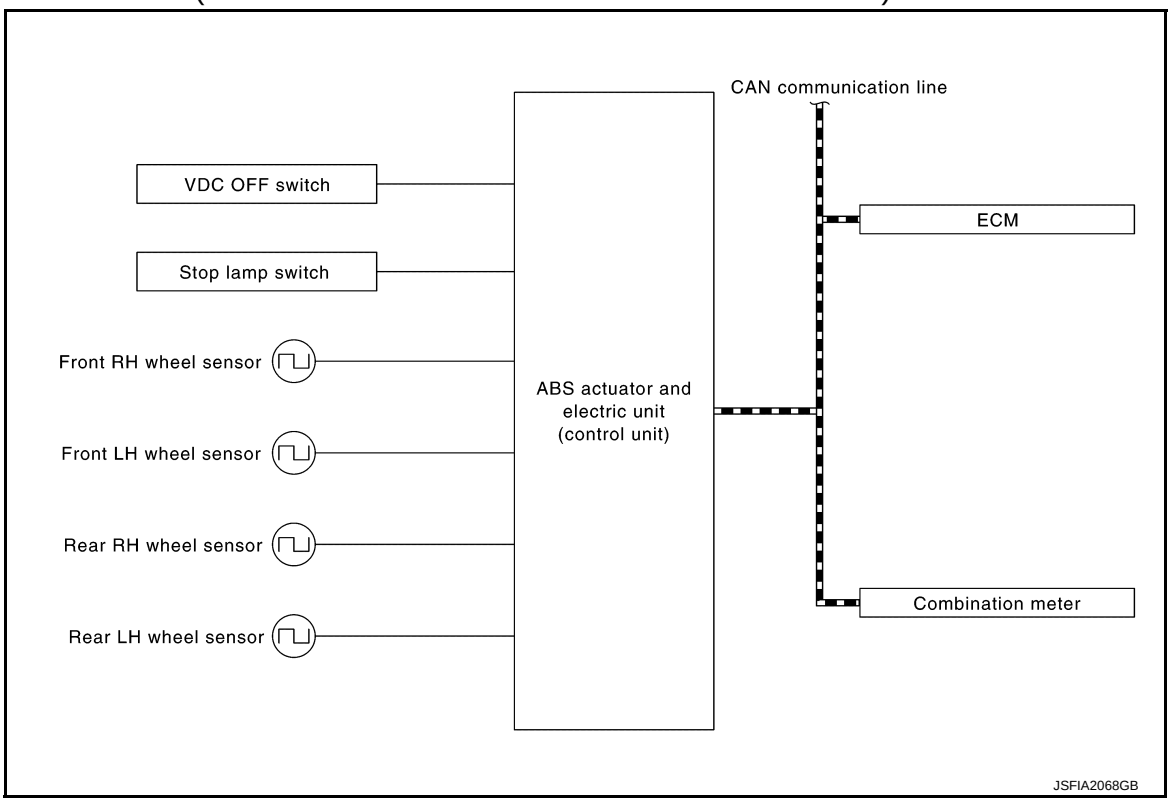


INPUT SIGNAL AND OUTPUT SIGNAL (FOR VR30DDTT ENGINE MODELS)

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

Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine speed signal • Engine torque signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Current gear position signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • VDC warning lamp signal • VDC OFF indicator lamp signal

SYSTEM DIAGRAM (FOR 2.0L TURBO GASOLINE ENGINE MODELS)



INPUT SIGNAL AND OUTPUT SIGNAL (FOR 2.0L TURBO GASOLINE ENGINE MODELS)

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

Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine torque signal • Engine speed signal • Current gear position signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • VDC warning lamp signal • VDC OFF indicator lamp signal

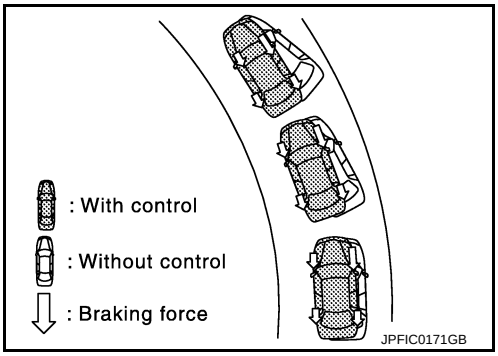
BRAKE FORCE DISTRIBUTION FUNCTION

BRAKE FORCE DISTRIBUTION FUNCTION : System Description

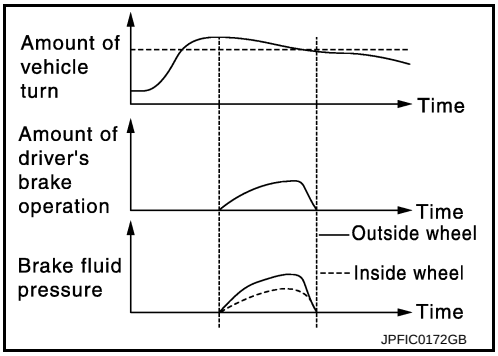
INFOID:0000000012793731

- Brake force distribution function is controlled by ABS actuator and electric unit (control unit).

- Brake force distribution function helps provide a more stable and secure feeling.



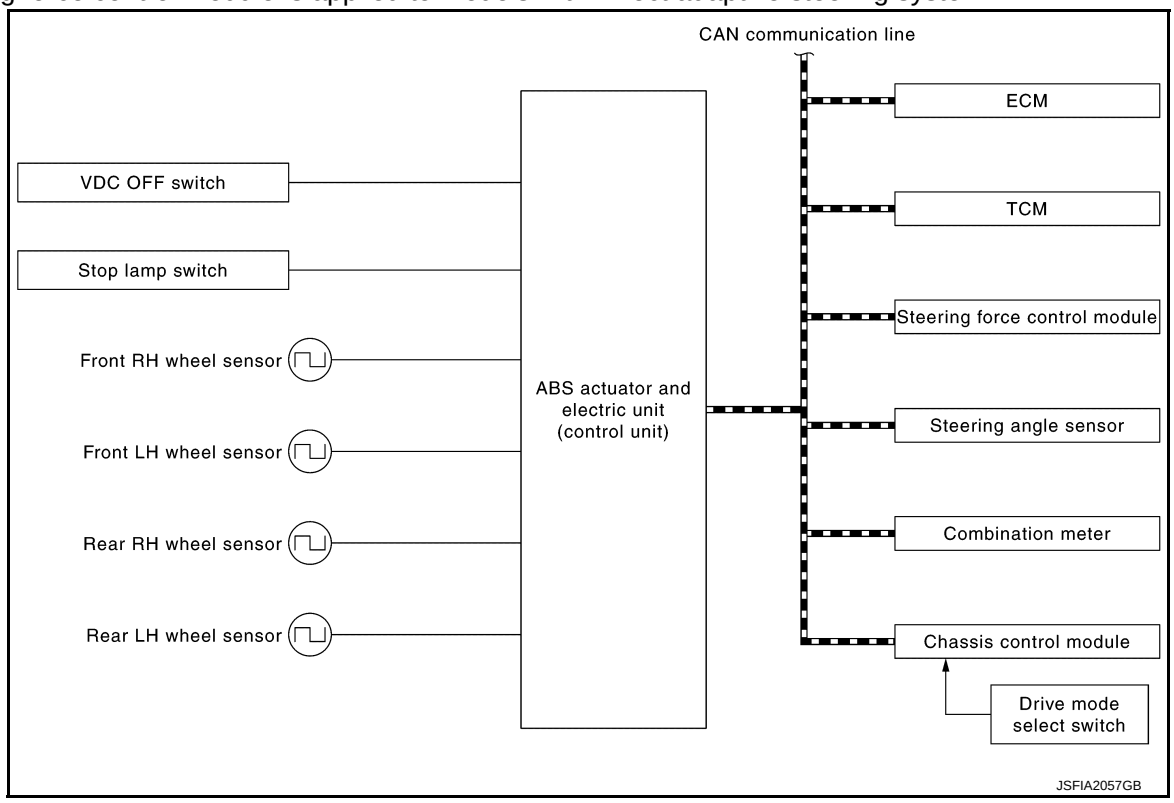
- During cornering, when brake operation is performed brake fluid pressure of each wheel is controlled based on steering operation amount by the driver and vehicle cornering status amount detected by each sensor.
- Fail-safe function is adopted. When a malfunction occurs in Brake force distribution function, the control is suspended for VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. The vehicle status becomes the same as models without VDC function, TCS function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function. However, ABS function and EBD function are operated normally. Refer to BRC-29, "Fail-Safe".



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

SYSTEM DIAGRAM (FOR VR30DDTT ENGINE MODELS)

NOTE:
Steering force control module is applied to models with Direct adaptive steering system.



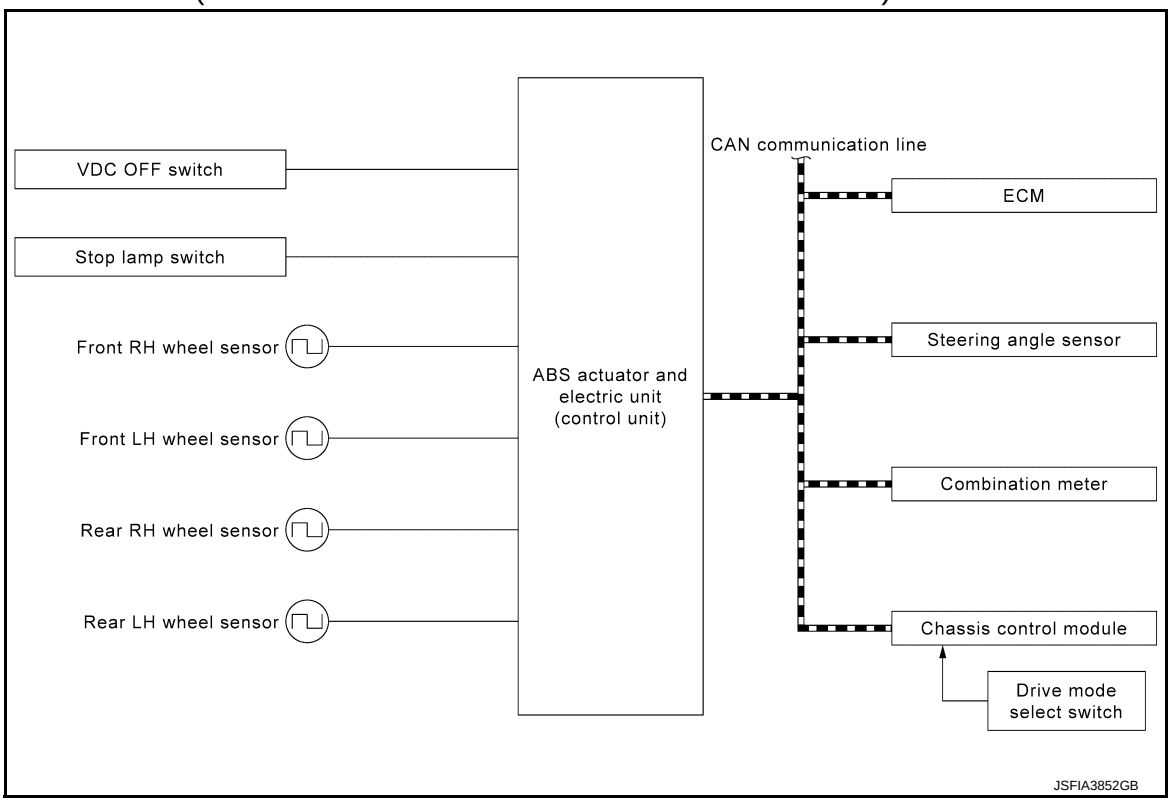
INPUT SIGNAL AND OUTPUT SIGNAL (FOR VR30DDTT ENGINE MODELS)

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

Component	Signal description
Steering force control module*	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering pinion angle signal • Direct adaptive steering malfunction 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 • Engine torque signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Current gear position signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake warning lamp signal • ABS warning lamp signal • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal • Steering angle sensor malfunction signal

*: Models with Direct adaptive steering system.

SYSTEM DIAGRAM (FOR 2.0L TURBO GASOLINE ENGINE MODELS)



INPUT SIGNAL AND OUTPUT SIGNAL (FOR 2.0L TURBO GASOLINE ENGINE MODELS)

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

Component	Signal description
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Accelerator pedal position signal • Engine speed signal • Engine torque signal • Current gear position signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Engine torque request signal
Chassis control module	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Active trace control signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake warning lamp signal • ABS warning lamp signal • VDC warning lamp signal • VDC OFF indicator lamp signal
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering angle sensor signal • Steering angle sensor malfunction signal

ACTIVE TRACE CONTROL FUNCTION

ACTIVE TRACE CONTROL FUNCTION : System Description

INFOID:0000000012793732

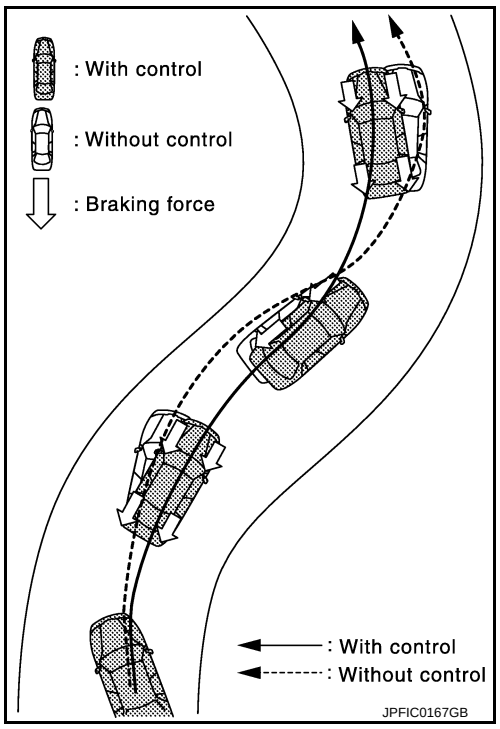
- Active trace control function controls the braking utilizing the ABS actuator and electric unit (control unit), depending on cornering condition calculated from driver's steering input and plural sensors.
- Active trace control function is aimed to enhance traceability at corners and smooth the vehicle movement to provide confident driving.
- When the drive mode select switch is set to the “SPORT” mode, the amount of brake control provided by active trace control is reduced.
- For “PERSONAL” mode, the active trace control can be selected ON or OFF. Refer to DMS-13, "Infiniti InTuition : System Description".
- When the VDC OFF switch is used to turn OFF the VDC system, the active trace control system is also turned OFF.
- When the active trace control is operated, active trace control graphics are shown on the information display of combination meter. These are shown only when “Chassis control” is selected on the information display. Refer to DAS-523, "INFORMATION DISPLAY (COMBINATION METER) : Chassis Control Display".
- When the active trace control is not functioning properly, the master warning lamp illuminates. Warning message “Chassis control” will also appear on information display.

NOTE:

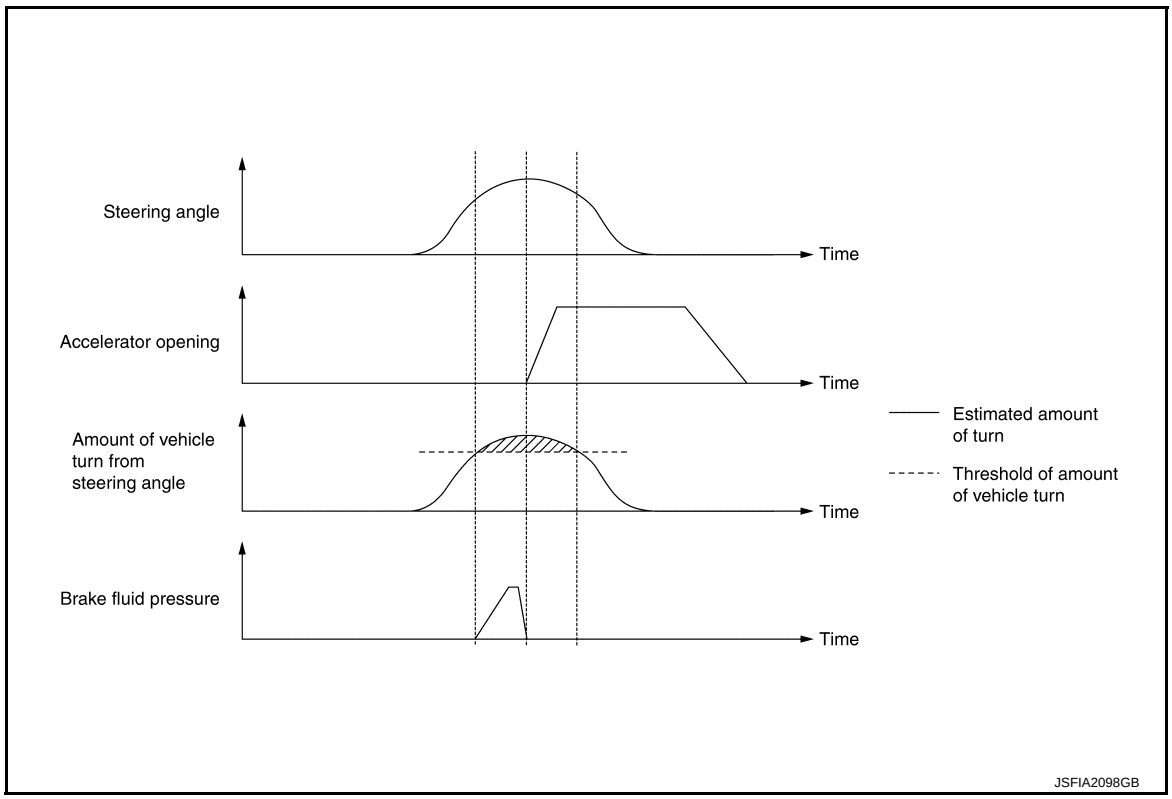
- The active trace control may not be effective depending on the driving condition. Always driving carefully and attentively.
- Brake pedal may vibrate and brake pedal feel may change during active trace control operation. Also operation noise may be noticeable during operation. These are not abnormal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

OPERATION CHARACTERISTICS

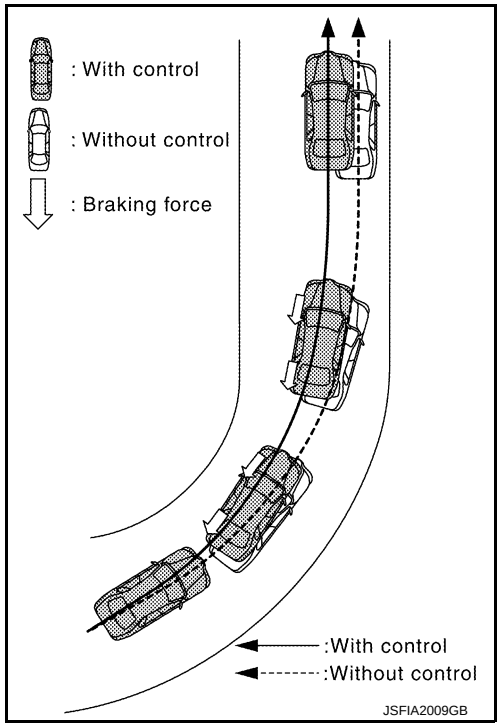
Active trace control helps enhance the transition from braking into and then accelerating out of corners. Active trace control utilizes the vehicle′s electrically-driven intelligent brake system to help improve cornering feel by automatically applying brakes. Furthermore, Active trace control will apply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



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



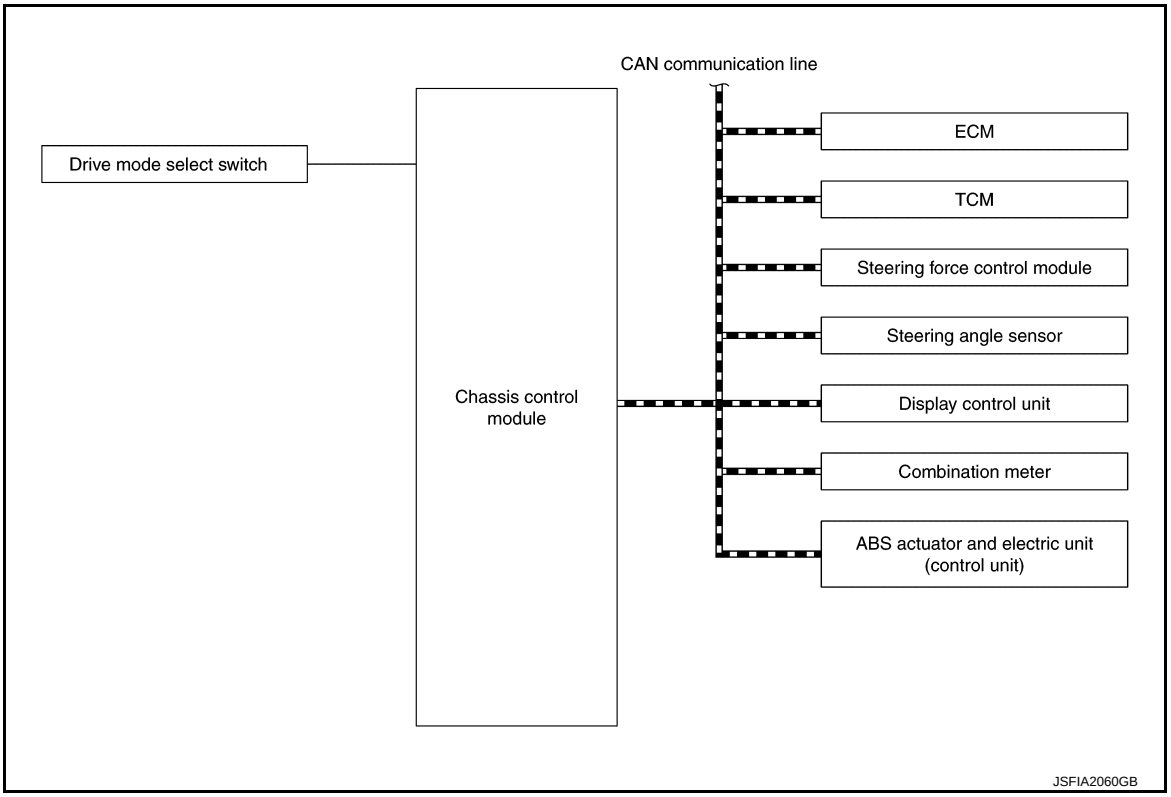
- During cornering, the brake control system limits changes in steering angle by controlling the inner ring brakes according to accelerator pedal operation and allows smooth movement of the vehicle to achieve stable cornering.



SYSTEM DIAGRAM (FOR VR30DDTT ENGINE MODELS)

NOTE:

Steering force control module is applied to models with Direct adaptive steering system.



INPUT SIGNAL AND OUTPUT SIGNAL (FOR VR30DDTT ENGINE MODELS)

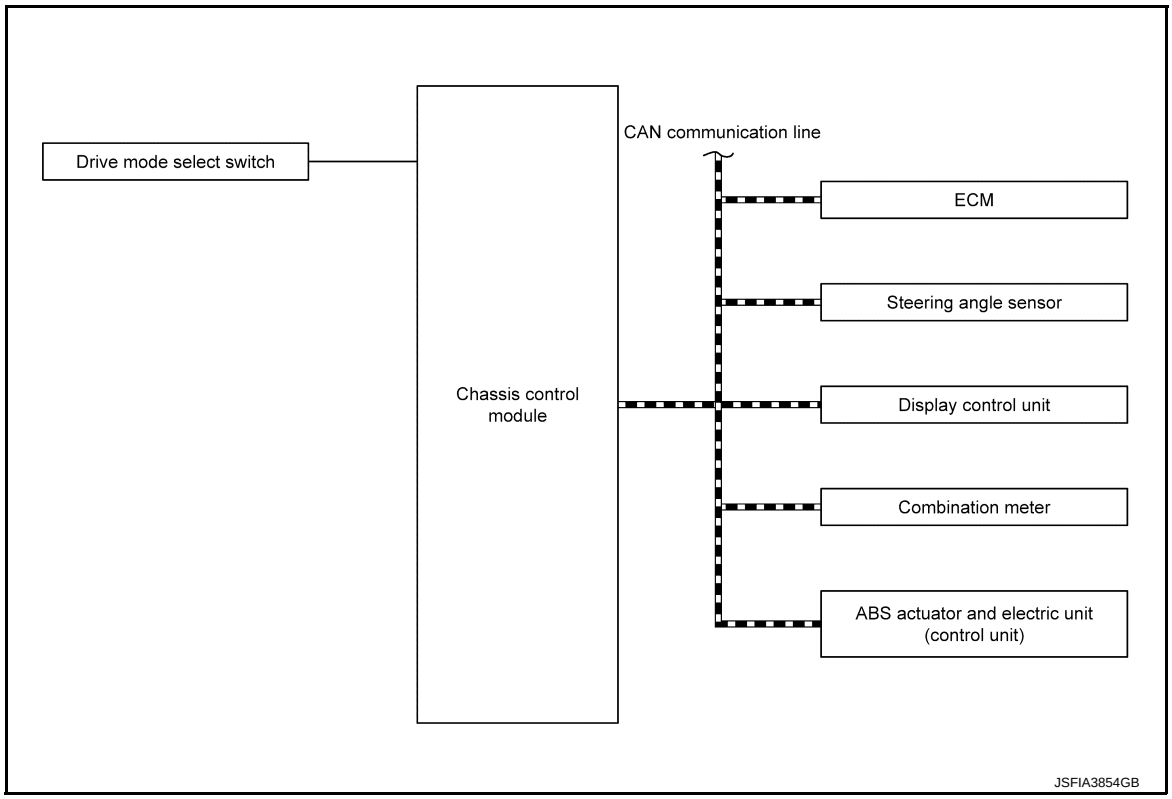
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
Steering force control module*	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Steering pinion angle signal • Direct adaptive steering malfunction signal
ECM	Mainly transmits the following signals to chassis control module via CAN communication. • Accelerator pedal position signal • Engine torque signal • Engine speed signal
TCM	Mainly transmits the following signals to chassis control module via CAN communication. • Current gear position signal
ABS actuator and electric unit (control unit)	Mainly transmits the following signals to chassis control module via CAN communication. • Front LH wheel speed signal • Front RH wheel speed signal • Rear LH wheel speed signal • Rear RH wheel speed signal • ABS operation signal • TCS operation signal • VDC operation signal • Stop lamp switch signal • Vehicle speed signal (ABS) • Yaw rate signal • Side G signal • Decel G signal • VDC OFF switch signal • Brake fluid pressure signal • Steering angle sensor signal Mainly receives the following signals from chassis control module via CAN communication. • Active trace control signal
Steering angle sensor	Mainly transmits the following signals to chassis control module via CAN communication. • Steering angle sensor signal

Component	Signal description
Display control unit	Mainly transmits the following signals to chassis control module via CAN communication line. • System selection signal
Combination meter	Mainly receives the following signals from chassis control module via CAN communication. • Chassis control malfunction signal • Active trace control display signal
Drive mode select switch	Mainly transmits the following signals to chassis control module. • Drive mode signal

*: Models with Direct adaptive steering system.

SYSTEM DIAGRAM (FOR 2.0L TURBO GASOLINE ENGINE MODELS)



INPUT SIGNAL AND OUTPUT SIGNAL (FOR 2.0L TURBO GASOLINE ENGINE MODELS)

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

Component	Signal description
ECM	Mainly transmits the following signals to chassis control module via CAN communication. • Accelerator pedal position signal • Engine torque signal • Engine speed signal • Current gear position signal
ABS actuator and electric unit (control unit)	Mainly transmits the following signals to chassis control module via CAN communication. • Front LH wheel speed signal • Front RH wheel speed signal • Rear LH wheel speed signal • Rear RH wheel speed signal • ABS operation signal • TCS operation signal • VDC operation signal • Stop lamp switch signal • Vehicle speed signal (ABS) • Yaw rate signal • Side G signal • Decel G signal • VDC OFF switch signal • Brake fluid pressure signal • Steering angle sensor signal Mainly receives the following signals from chassis control module via CAN communication. • Active trace control signal
Steering angle sensor	Mainly transmits the following signals to chassis control module via CAN communication. • Steering angle sensor signal
Display control unit	Mainly transmits the following signals to chassis control module via CAN communication line. • System selection signal
Combination meter	Mainly receives the following signals from chassis control module via CAN communication. • Chassis control malfunction signal • Active trace control display signal
Drive mode select switch	Mainly transmits the following signals to chassis control module. • Drive mode signal

WARNING/INDICATOR/CHIME LIST

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

INFOID:0000000012793733

FOR U.S.A.

Name	Design	Layout/Function
ABS warning lamp	ABS	For layout: Refer to MWI-9, "METER SYSTEM : Design". For function: Refer to MWI-20, "WARNING LAMPS/INDICATOR LAMPS : ABS Warning Lamp".
Brake warning lamp	BRAKE	For layout: Refer to MWI-9, "METER SYSTEM : Design". For function: Refer to MWI-22, "WARNING LAMPS/INDICATOR LAMPS : Brake Warning Lamp".
VDC OFF indicator lamp		For layout: Refer to MWI-9, "METER SYSTEM : Design". For function: Refer to MWI-51, "WARNING LAMPS/INDICATOR LAMPS : VDC OFF Indicator Lamp".
VDC warning lamp		For layout: Refer to MWI-9, "METER SYSTEM : Design". For function: Refer to MWI-52, "WARNING LAMPS/INDICATOR LAMPS : VDC Warning Lamp".

EXCEPT FOR U.S.A.

Name	Design	Layout/Function
ABS warning lamp		For layout: Refer to MWI-9, "METER SYSTEM : Design". For function: Refer to MWI-20, "WARNING LAMPS/INDICATOR LAMPS : ABS Warning Lamp".
Brake warning lamp		For layout: Refer to MWI-9, "METER SYSTEM : Design". For function: Refer to MWI-22, "WARNING LAMPS/INDICATOR LAMPS : Brake Warning Lamp".
VDC OFF indicator lamp		For layout: Refer to MWI-9, "METER SYSTEM : Design". For function: Refer to MWI-51, "WARNING LAMPS/INDICATOR LAMPS : VDC OFF Indicator Lamp".
VDC warning lamp		For layout: Refer to MWI-9, "METER SYSTEM : Design". For function: Refer to MWI-52, "WARNING LAMPS/INDICATOR LAMPS : VDC Warning Lamp".

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

CONSULT Function

INFOID:0000000012793734

APPLICATION ITEMS

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

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

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

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

SELF DIAGNOSTIC RESULT

Refer to BRC-72, "DTC Index".

When “CRNT” is displayed on self-diagnosis result,
- The system is presently malfunctioning.

When “PAST” is displayed on self-diagnosis result,
- System malfunction in the past is detected, but the system is presently normal.

Freeze frame data (FFD)

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

Item name	Display item
IGN counter (0 – 39)	The number of times that ignition switch is turned ON after the DTC is detected is displayed. • When “0” is displayed: It indicates that the system is presently malfunctioning. • When except “0” is displayed: It indicates that system malfunction in the past is detected, but the system is presently normal. **NOTE:** Each time when ignition switch is turned OFF to ON, numerical number increases in 1 → 2 → 3...38 → 39. When the operation number of times exceeds 39, the number do not increase and “39” is displayed until self-diagnosis is erased.

ACTIVE TEST

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

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

NOTE:
- “TEST IS STOPPED” is displayed approx. 10 seconds after operation start.
- When performing active test again after “TEST IS STOPPED” is displayed, select “BACK”.

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

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

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

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

ABS IN Valve (ACT) and ABS OUT Valve (ACT)
When “Up”, “ACT UP” or “ACT KEEP” is selected on display screen, the following items are displayed when system is normal.

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

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

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

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

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

DATA MONITOR

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

×: Applicable

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

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

Item (Unit)	Monitor item selection		Note
	INPUT SIGNALS	MAIN ITEMS	
VDC control mode(Note 5) (Standard/Sports)	×	×	VDC control status configured with the drive mode selector is displayed.
USS SIG(Note 6) (On/Off)			hill start assist operation status is displayed.

Note 1: Refer to BRC-18, "System Description" for ON/OFF conditions of each warning lamp and indicator lamp.
Note 2: Models with direct adaptive steering system
Note 3: Models without direct adaptive steering system
Note 4: AWD models
Note 5: VR30DDTT engine models
Note 6: “USS” means “hill start assist”

WORK SUPPORT

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

RE/PROGRAMMING, CONFIGURATION

Configuration includes the following functions.

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

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

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000012793735

CONSULT DATA MONITOR STANDARD VALUE

NOTE:

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

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

Monitor item	Condition	Reference values in normal operation
MOTOR RELAY	Active	On
	Not activated	Off
ACTUATOR RLY	Active	On
	When not operating (in fail-safe mode)	Off
ABS WARN LAMP	When ABS warning lamp is ON(Note 2)	On
	When ABS warning lamp is OFF(Note 2)	Off
OFF LAMP	When VDC OFF indicator lamp is ON(Note 2)	On
	When VDC OFF indicator lamp is OFF(Note 2)	Off
SLIP/VDC LAMP	When VDC warning lamp is ON(Note 2)	On
	When VDC warning lamp is OFF(Note 2)	Off
ACCEL POS SIG	Never depress accelerator pedal (with ignition switch ON)	0%
	Depress accelerator pedal (with ignition switch ON)	0 – 100%
SIDE G-SENSOR	Vehicle stopped	Approx. 0 m/s^2
	Right turn	Negative value
	Left turn	Positive value
DECEL G-SEN	When stopped	Approx. 0 m/s^2
	During acceleration	Positive value
	During deceleration	Negative value
STR ANGLE SIG	When driving straight	0±2.5°
	When steering wheel is steered to RH by 90°	Approx. +90°
	When steering wheel is steered to LH by 90°	Approx. –90°
ENGINE SPEED	Engine stopped	0 tr/min
	Engine running	Almost same reading as tachometer
PRESS SENSOR	Brake pedal not depressed	Approx. 0 bar
	Brake pedal depressed	0 – 255 bar (Pressure increases according to pedal effort.)
FLUID LEV SW	When brake fluid level switch is ON (brake fluid level is less than the specified level)	On
	When brake fluid level switch is OFF	Off
PARK BRAKE SW	When parking brake is active	On
	Parking brake is released	Off
CV1	Active	On
	Not activated	Off
CV2	Active	On
	Not activated	Off
EBD SIGNAL	EBD activated	On
	EBD not activated	Off
ABS SIGNAL	ABS is activated	On
	ABS is not activated	Off
TCS SIGNAL	TCS activated	On
	TCS not activated	Off

Monitor item	Condition	Reference values in normal operation
VDC SIGNAL	VDC activated	On
	VDC not activated	Off
EBD FAIL SIG	In EBD fail-safe	On
	EBD is normal	Off
ABS FAIL SIG	In ABS fail-safe	On
	ABS is normal	Off
TCS FAIL SIG	In TCS fail-safe	On
	TCS is normal	Off
VDC FAIL SIG	In VDC fail-safe	On
	VDC is normal	Off
CRANKING SIG	At cranking	On
	Other than at cranking	Off
EBD WARN LAMP	When brake warning lamp is ON(Note 2)	On
	When brake warning lamp is OFF(Note 2)	Off
GEAR	Driving	1 – 7 Depending on shift status
N POSI SIG	When selector lever is in the N position	On
	When selector lever is in the other position than N	Off
R POSI SIG	When selector lever is in the R position	On
	When selector lever is in the other position than R	Off
4WD MODE MON(Note 3)	Always	AUTO, LOCK, 2WD (depending on AWD control status)
VDC control mode(Note 4)	When drive mode select switch is the Sport+	Sports
	When drive mode select switch is NOT Sport+	Standard
USS SIG(Note 5)	When hill start assist is active	On
	When hill start assist is not active	Off

Note 1: Confirm tire pressure is standard value.
Note 2: Refer to BRC-18, "System Description" for ON/OFF conditions of each warning lamp and indicator lamp.
Note 3: AWD models
Note 4: VR30DDTT engine models
Note 5: “USS” means “hill start assist”

Fail-Safe

INFOID:0000000012793736

VDC FUNCTION, TCS FUNCTION, BRAKE LIMITED SLIP DIFFERENTIAL FUNCTION, BRAKE ASSIST FUNCTION, hill start assist FUNCTION AND BRAKE FORCE DISTRIBUTION FUNCTION

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

ABS FUNCTION

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

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

EBD FUNCTION

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

DTC	Fail-safe condition
C1101 C1102 C1103 C1104 C1105 C1106 C1107 C1108	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function (only when both 2 rear wheels are malfunctioning) • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1109 C1111	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1115 C1116	The following functions are suspended. • VDC function • TCS function • ABS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1120 C1121 C1122 C1123 C1124 C1125 C1126 C1127	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1130 C1138	The following functions are suspended. • VDC function • TCS function • Brake limited slip differential (BLSD) function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)

DTC	Fail-safe condition
C1140	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1142	The following functions are suspended. • VDC function • TCS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1143 C1144	The following functions are suspended. • VDC function • TCS function • Brake limited slip differential (BLSD) function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1145 C1146	The following functions are suspended. • VDC function • TCS function • ABS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1155	The following functions are suspended. • VDC function • TCS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1160	The following functions are suspended. • VDC function • TCS function • ABS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1164 C1165	The following functions are suspended. • VDC function • TCS function • ABS function • EBD function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)

DTC	Fail-safe condition
C1170	The following functions are suspended. • VDC function • TCS function • ABS function • Brake limited slip differential (BLSD) function • Brake assist function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)
C1197	Electrical vacuum assistance of brake booster is suspended.
C1198	
C1199	—
C119A	Electrical vacuum assistance of brake booster is suspended.
U1000	The following functions are suspended. • VDC function • TCS function • Brake limited slip differential (BLSD) function • hill start assist function • Brake force distribution function • Active trace control function (control of chassis control module)

DTC Inspection Priority Chart

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

Priority	Detected item (DTC)
1	• U1000 CAN COMM CIRCUIT
2	• C1170 VARIANT CODING
3	• C1130 ENGINE SIGNAL 1 • C1144 ST ANG SEN SIGNAL • C1138 4WAS CIRCUIT
4	• C1109 BATTERY VOLTAGE [ABNOMAL] • C1111 PUMP MOTOR • C1140 ACTUATOR RLY

Priority	Detected item (DTC)
5	• C1101 RR RH SENSOR-1 • C1102 RR LH SENSOR-1 • C1103 FR RH SENSOR-1 • C1104 FR LH SENSOR-1 • C1105 RR RH SENSOR-2 • C1106 RR LH SENSOR-2 • C1107 FR RH SENSOR-2 • C1108 FR LH SENSOR-2 • C1115 ABS SENSOR [ABNORMAL SIGNAL] • C1116 STOP LAMP SW • C1120 FR LH IN ABS SOL • C1121 FR LH OUT ABS SOL • C1122 FR RH IN ABS SOL • C1123 FR RH OUT ABS SOL • C1124 RR LH IN ABS SOL • C1125 RR LH OUT ABS SOL • C1126 RR RH IN ABS SOL • C1127 RR RH OUT ABS SOL • C1142 PRESS SEN CIRCUIT • C1143 ST ANG SEN CIRCUIT • C1145 YAW RATE SENSOR • C1146 SIDE G SEN CIRCUIT • C1160 DECEL G SEN SET • C1164 CV 1 • C1165 CV 2 • C1197 VACUUM SENSOR • C1198 VACUUM SEN CIR • C1199 BRAKE BOOSTER • C119A VACUUM SEN VOLT
6	• C1155 BR FLUID LEVEL LOW

DTC Index

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DTC	Display Item	VDC warning lamp	ABS warning lamp	Brake warning lamp	Refer to
C1101	RR RH SENSOR-1	ON	ON	OFF	BRC-98, "DTC Description"
C1102	RR LH SENSOR-1	ON	ON	OFF	
C1103	FR RH SENSOR-1	ON	ON	OFF	
C1104	FR LH SENSOR-1	ON	ON	OFF	
C1105	RR RH SENSOR-2	ON	ON	OFF	BRC-103, "DTC Description"
C1106	RR LH SENSOR-2	ON	ON	OFF	
C1107	FR RH SENSOR-2	ON	ON	OFF	
C1108	FR LH SENSOR-2	ON	ON	OFF	
C1109	BATTERY VOLTAGE [ABNOMAL]	ON	ON	ON	BRC-110, "DTC Description"
C1111	PUMP MOTOR	ON	ON	ON	BRC-112, "DTC Description"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	ON	ON	OFF	BRC-115, "DTC Description"
C1116	STOP LAMP SW	ON	ON	OFF	BRC-122, "DTC Description"
C1120	FR LH IN ABS SOL	ON	ON	ON	BRC-128, "DTC Description"
C1121	FR LH OUT ABS SOL	ON	ON	ON	BRC-130, "DTC Description"
C1122	FR RH IN ABS SOL	ON	ON	ON	BRC-128, "DTC Description"
C1123	FR RH OUT ABS SOL	ON	ON	ON	BRC-130, "DTC Description"
C1124	RR LH IN ABS SOL	ON	ON	ON	BRC-128, "DTC Description"
C1125	RR LH OUT ABS SOL	ON	ON	ON	BRC-130, "DTC Description"
C1126	RR RH IN ABS SOL	ON	ON	ON	BRC-128, "DTC Description"

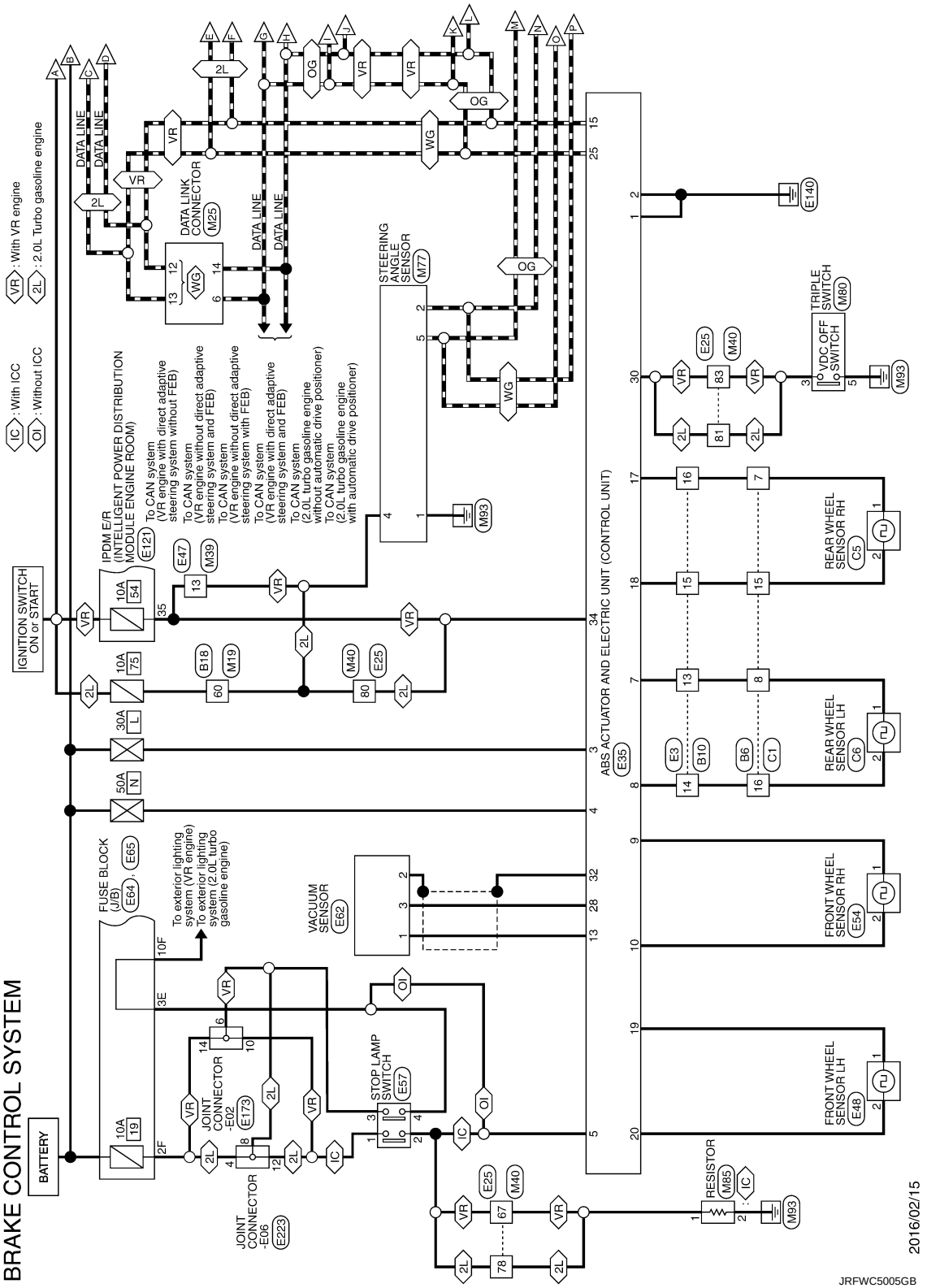
DTC	Display Item	VDC warning lamp	ABS warning lamp	Brake warning lamp	Refer to
C1127	RR RH OUT ABS SOL	ON	ON	ON	BRC-130, "DTC Description"
C1130	ENGINE SIGNAL 1	ON	OFF	OFF	BRC-132, "DTC Description"
C1138	4WAS CIRCUIT	ON	OFF	OFF	BRC-134, "DTC Description"
C1140	ACTUATOR RLY	ON	ON	ON	BRC-136, "DTC Description"
C1142	PRESS SEN CIRCUIT	ON	OFF	OFF	BRC-138, "DTC Description"
C1143	ST ANG SEN CIRCUIT	ON	OFF	OFF	BRC-141, "DTC Description"
C1144	ST ANG SEN SIGNAL	ON	OFF	OFF	BRC-145, "DTC Description"
C1145	YAW RATE SENSOR	ON	ON	OFF	BRC-147, "DTC Description"
C1146	SIDE G SEN CIRCUIT	ON	ON	OFF	
C1155	BR FLUID LEVEL LOW	ON	OFF	OFF	BRC-149, "DTC Description"
C1160	DECEL G SEN SET	ON	ON	OFF	BRC-153, "DTC Description"
C1164	CV 1	ON	ON	ON	BRC-155, "DTC Description"
C1165	CV 2	ON	ON	ON	
C1170	VARIANT CODING	ON	ON	OFF	BRC-157, "DTC Description"
C1197	VACUUM SENSOR	OFF	OFF	ON	BRC-159, "DTC Description"
C1198	VACUUM SEN CIR	OFF	OFF	ON	BRC-162, "DTC Description"
C1199	BRAKE BOOSTER	OFF	OFF	ON	BRC-164, "DTC Description"
C119A	VACUUM SEN VOLT	OFF	OFF	ON	BRC-167, "DTC Description"
U1000	CAN COMM CIRCUIT	ON	OFF	OFF	BRC-170, "DTC Description"

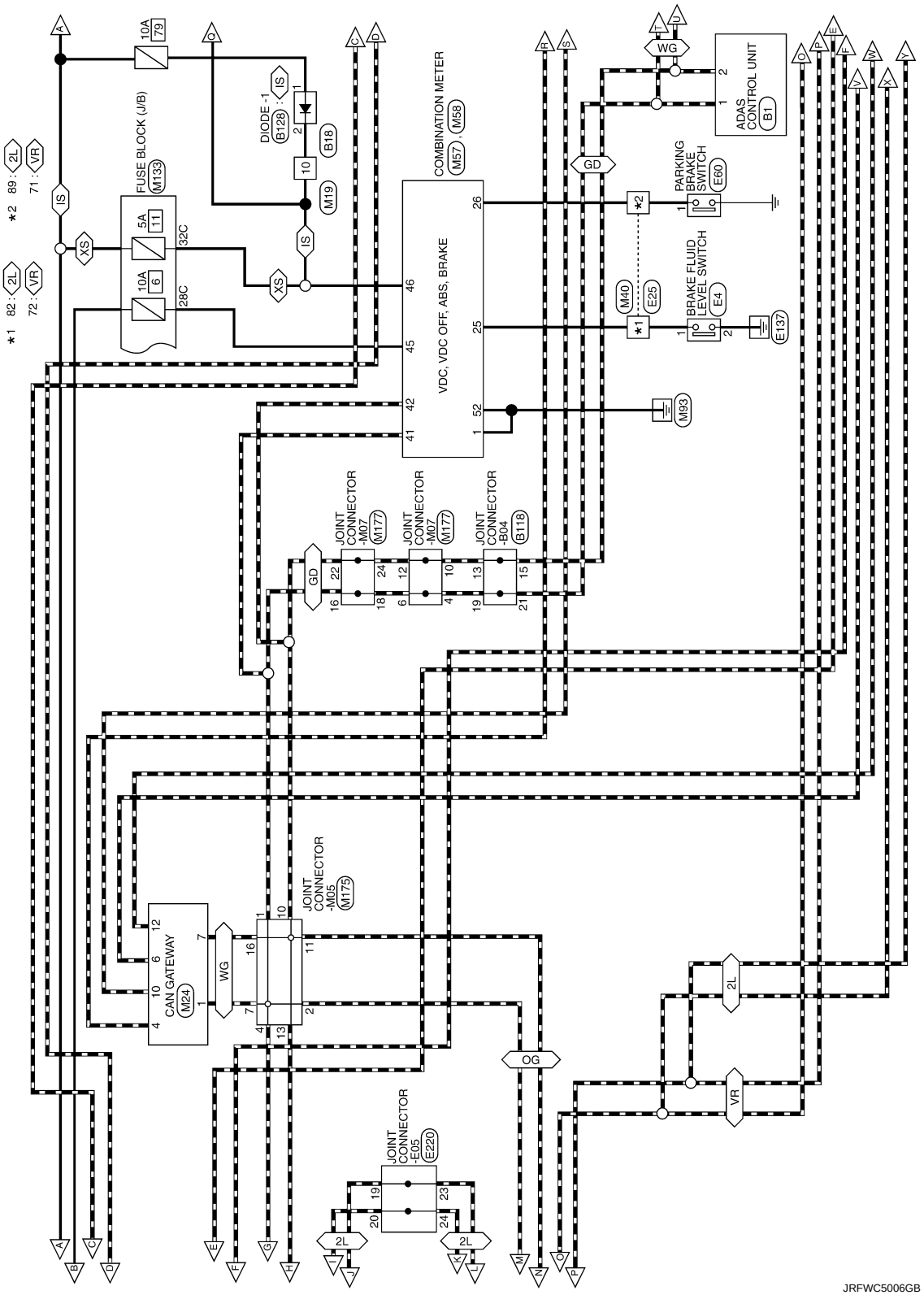
WIRING DIAGRAM

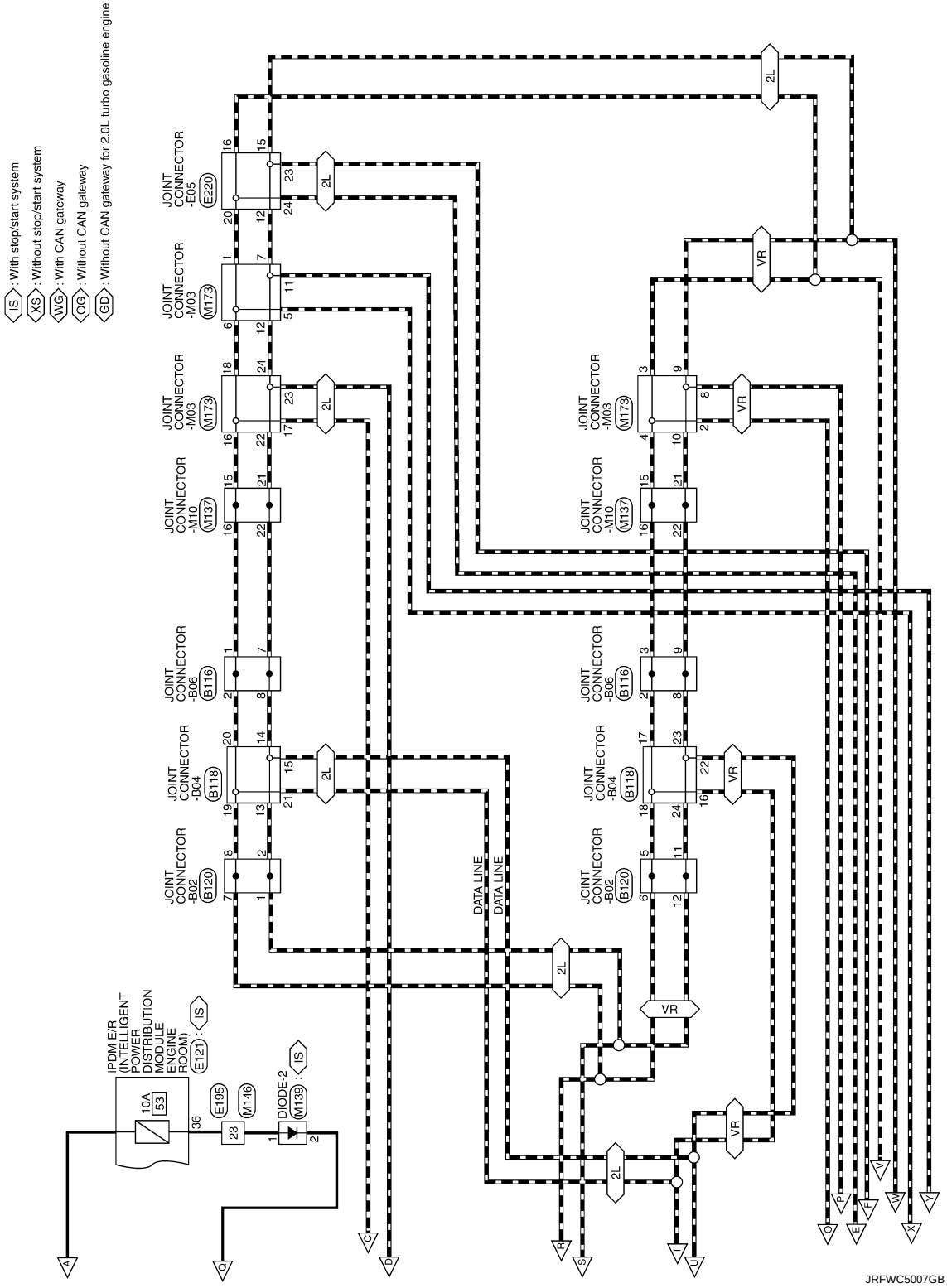
BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:0000000012793739




FUSE BLOCK (J/B) M133
10A 79
5A 11
10A 6
32C
28C
DIODE -1 B129
B18
M19
COMBINATION METER M57, M58
VDC, VDC OFF, ABS, BRAKE
ADAS CONTROL UNIT B1
PARKING BRAKE SWITCH E60
BRAKE FLUID LEVEL SWITCH E4
M40
E25
E137
M93
JOINT CONNECTOR -M07 M177
JOINT CONNECTOR -M07 M177
JOINT CONNECTOR -B04 B118
JOINT CONNECTOR -M05 M175
CAN GATEWAY M24
JOINT CONNECTOR -E05 E220
GD
WG
OG
VR
2L
IS
XS
JRFWC5006GB


IS : With stop/start system
XS : Without stop/start system
WG : With CAN gateway
OG : Without CAN gateway
GD : Without CAN gateway for 2.0L turbo gasoline engine
JOINT CONNECTOR -E05 (E220)
JOINT CONNECTOR -M03 (M173)
JOINT CONNECTOR -M10 (M137)
JOINT CONNECTOR -B06 (B116)
JOINT CONNECTOR -B04 (B118)
JOINT CONNECTOR -B02 (B120)
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) (E121) : IS
10A 53
E195
M146
DIODE-2 (M139) : IS
DATA LINE
DATA LINE
2L
VR
JRFWC5007GB

BRAKE CONTROL SYSTEM

Connector No.	B1
Connector Name	ADAS CONTROL UNIT
Connector Type	TH24FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	CAN-H
2	R	CAN-L
5	B	GROUND
6	L	ITS COMM-H
7	Y	ITS COMM-L
8	L	CHASSIS COMM-H
9	R	CHASSIS COMM-L
12	G	IGNITION [Except with VR30 engine and without ISS]
12	GR	IGNITION [VR30 engine and without ISS]
17	V	BRAKE HOLD RLY DRIVE SIGNAL
23	Y	STEERING SW SIGNAL GROUND
24	SB	STEERING SW SIGNAL

Connector No.	B6
Connector Name	WIRE TO WIRE
Connector Type	TH16MW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
7	LG	-
8	GR	-
9	SHIELD	-
10	L	- [With VR30 engine]
10	V	- [With 2.0L turbo gasoline engine]
11	G	- [With 2.0L turbo gasoline engine]
11	V	- [With VR30 engine]

12	GR	-
13	BG	-
14	LG	-
15	BR	-
16	BG	-

Connector No.	B10
Connector Name	WIRE TO WIRE
Connector Type	TH24FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	- [With 2.0L turbo gasoline engine]
1	Y	- [With VR30 engine]
2	W	-
3	LG	-
4	P	- [With VR30 engine]
4	SB	- [With 2.0L turbo gasoline engine]
5	L	-
6	V	-
7	LG	-
8	R	-
9	W	-
10	B	-
11	G	-
12	R	-
13	GR	-
14	BG	-
15	BR	-
16	LG	-
17	V	-
18	BR	-
19	LG	- [With 2.0L turbo gasoline engine]
19	Y	- [With VR30 engine]
20	Y	-
21	R	- [With 2.0L turbo gasoline engine]
21	V	- [With VR30 engine]
22	L	-
23	V	-
24	B	- [With VR30 engine]

24	R	- [With 2.0L turbo gasoline engine]

Connector No.	B18
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

Terminal No.	Color Of Wire	Signal Name [Specification]
1	Y	-
2	G	-
3	L	-
4	LG	-
5	Y	-
6	R	-
7	V	-
8	LG	-
10	BG	-
11	BG	-
12	LG	-
13	GR	-
14	R	-
15	L	-
16	V	-
18	W	-
19	BR	-
20	W	-
22	R	-
23	V	-
24	R	- [With 2.0L turbo gasoline engine]
24	Y	- [With VR30 engine]
25	P	- [With 2.0L turbo gasoline engine and without gateway]
25	V	- [With 2.0L turbo gasoline engine and with gateway]
25	W	- [With VR30 engine]
26	G	-
27	R	-
28	R	-
31	B	- [With VR30 engine]
31	BR	- [With 2.0L turbo gasoline engine]
32	B	-
33	B	-

34	LG	-
35	P	-
36	W	-
37	SB	-
38	LG	-
40	P	-
41	SB	-
42	BR	-
43	BG	-
44	BG	-
46	R	-
50	W	-
51	SB	-
52	V	-
53	LG	-
54	R	-
55	R	-
57	W	-
58	V	-
59	GR	-
60	G	-
61	G	-
62	BG	-
63	BR	-
64	Y	-
66	R	-
70	R	-
71	W	-
72	B	-
73	W	-
74	L	-
75	R	- [Without paddle shift]
75	V	- [With paddle shift]
76	BR	-
77	B	-
78	SB	-
79	V	- [With VR30 engine]
79	W	- [With 2.0L turbo gasoline engine]
81	B	-
82	R	-
83	BG	-
84	L	-
85	R	- [Without paddle shift]
85	V	- [With paddle shift]
86	B	-
88	G	-
89	V	- [With 2.0L turbo gasoline engine]
89	W	- [With VR30 engine]
91	GR	-

JRFWC5008GB

BRAKE CONTROL SYSTEM

94	GR	-
96	Y	-
97	V	-
98	BR	- [With VR30 engine and with BOSE system]
98	Y	- [Except with VR30 engine and with BOSE system]

Connector No.	B116
Connector Name	JOINT CONNECTOR-B06
Connector Type	24342_4GA2A

H.S.

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

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	R	-
8	R	- [With Gateway]
8	V	- [Without Gateway]
9	R	- [With Gateway]
9	V	- [Without Gateway]
10	R	- [With VR30 engine]
10	V	- [With 2.0L turbo gasoline engine]
11	V	-
12	P	- [With Gateway]
12	R	- [Without Gateway]
13	SHIELD	-
14	SHIELD	-
15	B	- [With 2.0L turbo gasoline engine]
15	SHIELD	- [With VR30 engine]
16	L	- [With VR30 engine]
16	SHIELD	- [With 2.0L turbo gasoline engine]
17	L	- [With VR30 engine]
17	SHIELD	- [With 2.0L turbo gasoline engine]
18	L	- [With VR30 engine]
18	SHIELD	- [With 2.0L turbo gasoline engine]
19	L	- [With VR30 engine]
19	SHIELD	- [With 2.0L turbo gasoline engine]
20	L	- [With 2.0L turbo gasoline engine]
20	SHIELD	- [With VR30 engine]
21	L	-
22	P	-
23	P	-
24	P	- [With VR30 engine]
24	Y	- [With 2.0L turbo gasoline engine]

Connector No.	B118
Connector Name	JOINT CONNECTOR-B04
Connector Type	24342_4GA2A

H.S.

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

Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	- [With VR30 engine]
1	SHIELD	- [With 2.0L turbo gasoline engine]
2	LG	- [With VR30 engine]
2	SHIELD	- [With 2.0L turbo gasoline engine]
3	SHIELD	-
4	LG	- [With VR30 engine]
4	SHIELD	- [With 2.0L turbo gasoline engine]
5	LG	- [With VR30 engine]
5	SHIELD	- [With 2.0L turbo gasoline engine]
6	LG	- [With VR30 engine]
6	SHIELD	- [With 2.0L turbo gasoline engine]
7	R	- [Color of wire differs depending on production]
7	V	- [Color of wire differs depending on production]
8	LG	- [With 2.0L turbo gasoline engine]
8	R	- [With VR30 engine and without paddle shift]
8	V	- [With VR30 engine and with paddle shift]
9	LG	- [With 2.0L turbo gasoline engine]
9	R	- [With VR30 engine and without paddle shift]
9	V	- [With VR30 engine and with paddle shift]
10	LG	- [With 2.0L turbo gasoline engine]
10	SHIELD	- [With VR30 engine]
11	LG	- [With 2.0L turbo gasoline engine]
11	SHIELD	- [With VR30 engine]
12	LG	- [With 2.0L turbo gasoline engine]
12	SHIELD	- [With VR30 engine]
13	L	- [With VR30 engine]
13	P	- [With 2.0L turbo gasoline engine and without gateway]
13	R	- [With 2.0L turbo gasoline engine and with gateway]
14	L	- [With VR30 engine]
14	P	- [With 2.0L turbo gasoline engine and without gateway]
14	R	- [With 2.0L turbo gasoline engine and with gateway]
15	L	- [With VR30 engine]
15	R	- [With 2.0L turbo gasoline engine]
16	L	-
17	L	-
18	L	-
19	L	- [With 2.0L turbo gasoline engine]
19	SHIELD	- [With VR30 engine]
20	L	- [With 2.0L turbo gasoline engine]
20	SHIELD	- [With VR30 engine]
21	L	- [With 2.0L turbo gasoline engine]
21	SHIELD	- [With VR30 engine]
22	R	-
23	R	-
24	R	-

Connector No.	B120
Connector Name	JOINT CONNECTOR-B02
Connector Type	24342_4GA2A

H.S.

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

Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-
2	R	-
3	L	- [With VR30 engine]
3	R	- [With 2.0L turbo gasoline engine]
4	L	- [With VR30 engine]
4	R	- [With 2.0L turbo gasoline engine]
5	L	-
6	L	-
7	L	-
8	L	-
9	L	- [With 2.0L turbo gasoline engine]
9	R	- [With VR30 engine]
10	L	- [With 2.0L turbo gasoline engine]
10	R	- [With VR30 engine]
11	R	-
12	R	-
13	W	-
14	W	-
15	W	-
17	SHIELD	-
18	B	-
19	B	- [With 2.0L turbo gasoline engine]
19	GR	- [With VR30 engine]
20	GR	- [With VR30 engine]
20	SHIELD	- [With 2.0L turbo gasoline engine]
21	B	- [With 2.0L turbo gasoline engine]
21	GR	- [With VR30 engine]
22	W	-
23	W	-
24	W	-

Connector No.	B128
Connector Name	DIODE-1
Connector Type	ET02-2W

H.S.

2	1		

Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-
2	BG	-

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Type	TH16FW-NH

H.S.

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

Terminal No.	Color Of Wire	Signal Name [Specification]
7	LG	-
8	GR	-
9	SHIELD	-

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BRAKE CONTROL SYSTEM

10	L	- [With VR30 engine]
10	V	- [With 2.0L turbo gasoline engine]
11	G	-
12	GR	-
13	BG	-
14	LG	-
15	BR	-
16	BG	-

Connector No.	C5
Connector Name	REAR WHEEL SENSOR RH
Connector Type	RHO2FGY

H.S.

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

Connector No.	C6
Connector Name	REAR WHEEL SENSOR LH
Connector Type	RHO2FB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	-
2	BG	-

Connector No.	E3
Connector Name	WIRE TO WIRE
Connector Type	TH24MW-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	- [With 2.0L turbo gasoline engine]
1	Y	- [With VR30 engine]
2	W	-
3	LG	-
4	P	- [With VR30 engine]
4	SB	- [With 2.0L turbo gasoline engine]
5	L	-
6	Y	-
7	LG	-
8	BG	-
9	W	-
10	B	-
11	G	-
12	R	-
13	GR	-
14	G	-
15	LG	- [With 2.0L turbo gasoline engine]
15	V	- [With VR30 engine]
16	Y	-
17	P	-
18	BR	-
19	LG	- [With 2.0L turbo gasoline engine]
19	Y	- [With VR30 engine]
20	GR	-
21	R	- [With 2.0L turbo gasoline engine]
21	V	- [With VR30 engine]
22	L	-
23	P	-
24	B	- [With VR30 engine]
24	BR	- [With 2.0L turbo gasoline engine]

Connector No.	E4
Connector Name	BRAKE FLUID LEVEL SWITCH
Connector Type	YVO2FGY

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	-
2	B/W	-

Connector No.	E25
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	BG	-
6	V	-
7	L	-
8	BG	- [With VR30 engine]
8	BR	- [With 2.0L turbo gasoline engine]
9	B	- [With 2.0L turbo gasoline engine]
9	GR	- [With VR30 engine] [Color of wire differs depending on production]
9	LG	- [With VR30 engine] [Color of wire differs depending on production]
10	BR	-
11	L	-
12	GR	- [With VR30 engine]
12	P	- [With 2.0L turbo gasoline engine]
13	SHIELD	- [With 2.0L turbo gasoline engine]
13	W	- [With VR30 engine]
14	B	-
15	GR	- [With 2.0L turbo gasoline engine]
15	SB	- [With VR30 engine]
16	BR	- [With 2.0L turbo gasoline engine]
16	Y	- [With VR30 engine]
17	BR	- [With VR30 engine]
17	GR	- [With 2.0L turbo gasoline engine]
18	G	- [With 2.0L turbo gasoline engine]
18	P	- [With VR30 engine]
19	Y	-
31	W	- [With 2.0L turbo gasoline engine]
31	Y	- [With VR30 engine]
32	G	- [With 2.0L turbo gasoline engine]
32	GR	- [With VR30 engine]
33	L	- [With VR30 engine]
33	Y	- [With 2.0L turbo gasoline engine]
34	P	-
35	GR	-
36	R	-
37	L	- [With 2.0L turbo gasoline engine]
37	V	- [With VR30 engine]
38	L	- [With VR30 engine]
38	P	- [With 2.0L turbo gasoline engine and without gateway]
38	R	- [With 2.0L turbo gasoline engine and with gateway]
39	BR	- [With 2.0L turbo gasoline engine]
39	Y	- [With VR30 engine]
40	SB	-
41	LG	-
44	Y	-
45	L	- [With 2.0L turbo gasoline engine]
45	W	- [With VR30 engine]
46	B	- [With VR30 engine]
46	Y	- [With 2.0L turbo gasoline engine]
47	G	-
48	SHIELD	-
49	R	-
50	BR	- [With VR30 engine]
50	GR	- [With 2.0L turbo gasoline engine]
51	L	-
52	W	-
53	V	-
54	P	- [With VR30 engine]
54	W	- [With 2.0L turbo gasoline engine]
55	B	- [With 2.0L turbo gasoline engine]
55	W	- [With VR30 engine]
56	BG	- [With 2.0L turbo gasoline engine]
56	SB	- [With VR30 engine]
57	BG	- [With VR30 engine]
57	W	- [With 2.0L turbo gasoline engine]
58	B	- [Color of wire differs depending on production]
58	B/W	- [Color of wire differs depending on production]
59	W	-
61	R	-
64	Y	-

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BRAKE CONTROL SYSTEM

65	BR	- [Color of wire differs depending on production]
65	GR	- [Color of wire differs depending on production]
66	GR	-
67	LG	-
68	BG	-
69	L	-
70	R	-
71	G	- [With 2.0L turbo gasoline engine]
71	LG	- [With VR30 engine]
72	L	- [With 2.0L turbo gasoline engine]
72	V	- [With VR30 engine]
73	G	- [With VR30 engine]
73	W	- [With 2.0L turbo gasoline engine]
74	BR	- [With VR30 engine]
74	L	- [With 2.0L turbo gasoline engine]
75	P	- [With 2.0L turbo gasoline engine and without gateway]
75	R	- [With 2.0L turbo gasoline engine and with gateway]
75	V	- [With VR30 engine]
76	G	-
77	Y	-
78	LG	- [With 2.0L turbo gasoline engine and with ADAS]
78	P	- [With VR30 engine]
78	V	- [With 2.0L turbo gasoline engine and without ADAS]
79	SB	-
80	G	-
81	R	-
82	V	-
83	BR	- [With 2.0L turbo gasoline engine]
83	R	- [With VR30 engine]
84	LG	-
86	BG	-
87	G	-
89	LG	-
90	G	- [With VR30 engine]
90	GR	- [With 2.0L turbo gasoline engine]
91	G	-
93	BG	-
94	GR	- [With VR30 engine]
94	L	- [With 2.0L turbo gasoline engine]
95	BG	- [With VR30 engine]
95	P	- [With 2.0L turbo gasoline engine and without gateway]
95	R	- [With 2.0L turbo gasoline engine and with gateway]
96	W	-
97	LG	-
98	L	-
99	LG	- [With 2.0L turbo gasoline engine]
99	P	- [With VR30 engine]
100	SHIELD	-

H.S.

Connector No.	E35
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Type	SAZ30FB-SJZ4-LU

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GND
2	B	GND
3	G	VALVE BATTERY [With VR30 engine]
3	P	VALVE BATTERY [With 2.0L turbo gasoline engine]
4	Y	MOTOR BATTERY
5	LG	STOP LAMP SW SIGNAL [With ADAS]
5	V	STOP LAMP SW SIGNAL [With ASCD]
7	GR	RR LH WHEEL SENSOR SIGNAL
8	G	RR LH WHEEL SENSOR POWER SUPPLY
9	BR	FR RH WHEEL SENSOR SIGNAL
10	GR	FR RH WHEEL SENSOR POWER SUPPLY
13	R	VACUUM SENSOR SIGNAL
15	P	CAN-L [Without Gateway]
15	R	CAN-L [With gateway]
17	Y	RR RH WHEEL SENSOR SIGNAL
18	LG	RR RH WHEEL SENSOR POWER SUPPLY [With 2.0L turbo gasoline engine]
18	V	RR RH WHEEL SENSOR POWER SUPPLY [With VR30 engine]
19	SB	FR LH WHEEL SENSOR SIGNAL
20	BG	FR LH WHEEL SENSOR POWER SUPPLY
25	L	CAN-H
28	G	VACUUM SENSOR POWER SUPPLY
30	R	VDC OFF SW SIGNAL
32	SHIELD	VACUUM SENSOR GROUND
34	G	IGN

H.S.

Connector No.	E47
Connector Name	WIRE TO WIRE
Connector Type	TH32MW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	- [Color of wire differs depending on production]
1	Y	- [Color of wire differs depending on production]
2	V	-
3	L	-
4	P	- [Without Gateway]
4	R	- [With Gateway]
5	W	-
6	SB	-
7	BR	- [Color of wire differs depending on production]
7	L	- [Color of wire differs depending on production]
8	W	-
9	BG	- [Without BOSE system]
9	V	- [With BOSE system]
10	V	-
11	SB	-
12	G	-
13	G	-
15	BR	-
16	P	-
17	SHIELD	-
18	L	-
19	Y	-
20	W	-
21	G	-
22	R	-
23	BR	-
24	R	-
25	L	-
26	BG	-
27	LG	-
28	BR	-
29	W	-
30	Y	-
31	G	-
32	GR	-

H.S.

Connector No.	E48
Connector Name	FRONT WHEEL SENSOR LH
Connector Type	RH02FB

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

H.S.

Connector No.	E54
Connector Name	FRONT WHEEL SENSOR RH
Connector Type	RH02FB

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

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BRAKE CONTROL SYSTEM

Connector No.	E57
Connector Name	STOP LAMP SWITCH
Connector Type	M04FW-LC

Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	- [With ASCD]
1	L	- [With ADAS]
2	GR	- [With ASCD]
2	LG	- [With ADAS]
3	BR	-
4	V	-

Connector No.	E60
Connector Name	PARKING BRAKE SWITCH
Connector Type	TB01FW-LC

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

Connector No.	E62
Connector Name	VACUUM SENSOR
Connector Type	RH03FB

Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-
2	SHIELD	-
3	G	-

Connector No.	E64
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS08FW-CS

Terminal No.	Color Of Wire	Signal Name [Specification]
1E	G	-
2E	P	-
3E	V	-
4E	GR	-
6E	L	-
7E	BG	-

Connector No.	E65
Connector Name	FUSE BLOCK (J/B)
Connector Type	TH12FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
10F	W	-
11F	G	- [Color of wire differs depending on production]
11F	R	- [Color of wire differs depending on production]
12F	W	- [With VR30 engine]
12F	Y	- [With 2.0L turbo gasoline engine]
1F	R	-
2F	BR	-
3F	P	-
5F	P	-
6F	L	-
7F	R	-
8F	L	-
9F	L	-

Connector No.	E121
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH32FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
17	G	-
21	G	-
25	R	-
26	L	-

Terminal No.	Color Of Wire	Signal Name [Specification]
19	L	- [With 2.0L turbo gasoline engine]
19	P	- [With VR30 engine]
22	BG	-
23	GR	- [With VR30 engine]
23	LG	- [With 2.0L turbo gasoline engine and without Anti theft diode]
23	P	- [With 2.0L turbo gasoline engine and with Anti theft diode]
27	GR	-

Connector No.	E173
Connector Name	JOINT CONNECTOR-E02
Connector Type	SGA28FDGY-J

Terminal No.	Color Of Wire	Signal Name [Specification]
28	P	-
29	L	-
31	G	-
32	SB	-
33	SB	-
34	Y	-
35	G	-
36	SB	- [With VR30 engine]
36	W	- [With 2.0L turbo gasoline engine]
37	GR	-
38	BR	-
41	GR	-
43	V	-

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BRAKE CONTROL SYSTEM

Connector No.	E195
Connector Name	WIRE TO WIRE
Connector Type	TK36FW-NS10

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
5	BR	-
8	GR	-
9	P	-
10	R	-
11	L	-
12	P	-
13	GR	-
14	Y	-
15	G	-
16	W	-
17	L	-
18	R	-
19	BR	-
20	SHIELD	-
21	BR	-
22	V	-
23	W	-
24	L	-
25	G	-
26	G	-
30	Y	-
31	GR	-
32	SB	-
33	W	-
34	W	-
35	B	-
36	G	-
37	SHIELD	-
38	R	-
39	L	-
40	GR	-
41	W	-
42	B	-
43	BR	-
44	P	-
45	SB	-

46	Y	-

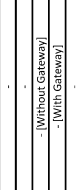
Connector No.	E220
Connector Name	JOINT CONNECTOR-E05
Connector Type	NH24FB-J

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
3	W	-
4	L	-
7	W	-
8	L	-
11	W	-
12	L	-
15	P	- [Without Gateway]
15	R	- [With Gateway]
16	L	-
19	P	- [Without Gateway]
19	R	- [With Gateway]
20	L	-
23	P	- [Without Gateway]
23	R	- [With Gateway]
24	L	-

Connector No.	E223
Connector Name	JOINT CONNECTOR-E06
Connector Type	SGA28FB-J

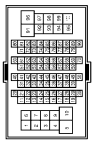
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
2	GR	-
3	G	-
4	BR	-
6	BG	-
7	G	-
8	BR	-
11	G	-
12	L	-
18	V	-
19	W	-
20	BG	-
22	GR	-
23	P	-
24	BR	-
26	V	-
27	W	-
28	BG	-

Connector No.	M19
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	Y	-
2	G	-
3	SB	-
4	BR	-
5	Y	-
6	R	-
7	W	-
8	V	-
10	BG	-
11	BR	-
12	LG	-
13	GR	-
14	R	-
15	L	-
16	V	-

18	W	-
19	BR	-
20	W	-
22	SB	-
23	R	-
24	R	- [With 2.0L turbo gasoline engine]
24	Y	- [With VR30 engine]
25	P	- [With 2.0L turbo gasoline engine]
25	W	- [With VR30 engine]
26	G	-
27	R	-
28	R	-
31	BR	-
32	B	-
33	B	-
34	V	-
35	P	-
36	W	-
37	SB	-
38	LG	-
40	P	-
41	G	-
42	BR	-
43	BR	-
44	BR	-
46	BG	-
50	W	-
51	Y	-
52	V	-
53	LG	-
54	R	-
55	R	-
57	W	-
58	V	-
59	BG	-
60	G	-
61	G	-
62	BG	-
63	BR	-
64	Y	-
66	R	-
70	LG	-
71	W	-
72	B	-
73	W	-
74	L	-
75	W	-
76	BR	-
77	B	-
78	SB	-

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BRAKE CONTROL SYSTEM

79	P	- [With VR30 engine]
79	W	- [With 2.0L turbo gasoline engine]
81	B	-
82	R	-
83	BG	-
84	L	-
85	W	-
86	B	-
88	G	-
89	V	- [With 2.0L turbo gasoline engine]
89	W	- [With VR30 engine]
91	GR	-
94	GR	-
96	W	-
97	V	-
98	BR	- [With VR30 engine and with BOSE system]
98	Y	- [Except with VR30 engine and with BOSE system]

Connector No.	M24
Connector Name	CAN GATEWAY
Connector Type	TH12FW-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	CAN-H (CAN COMMUNICATION CIRCUIT 1)
3	W	BATTERY POWER SUPPLY
4	L	CAN-H (CAN COMMUNICATION CIRCUIT 2)
5	B	GROUND
6	L	CAN-H (CAN COMMUNICATION CIRCUIT 2)
7	P	CAN-L (CAN COMMUNICATION CIRCUIT 1)
9	R	IGNITION POWER SUPPLY [With VR30 engine and without ISS]
9	W	IGNITION POWER SUPPLY [Except with VR30 engine and without ISS]
10	R	CAN-L (CAN COMMUNICATION CIRCUIT 2)
11	B	GROUND
12	R	CAN-L (CAN COMMUNICATION CIRCUIT 2)

Connector No.	M25
Connector Name	DATA LINK CONNECTOR
Connector Type	BD16FW

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
3	LG	M_CAN_L
4	B	EARTH
5	B	EARTH
6	L	CAN-H
7	V	KLINE [With 2.0L turbo gasoline engine]
7	W	KLINE [With VR30 engine]
8	W	IGN_SW
11	SB	M_CAN_H
12	R	CAN-L
13	L	CAN-H
14	P	CAN-L
16	W	POWER

Connector No.	M39
Connector Name	WIRE TO WIRE
Connector Type	TH32FW-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	W/B	-
2	SB	-
3	L	-
4	P	- [Without Gateway]
4	R	- [With Gateway]
5	BR	-
6	SB	-
7	L	-
8	W	-
9	P	- [Without BOSE system]
9	V	- [With BOSE system]
10	V	-
11	SB	-
12	G	-
13	G	-
15	R	-
16	SB	-
17	SHIELD	-
18	W	-
19	Y	-
20	L	-
21	G	-
22	R	-
23	BR	-
24	R	-
25	L	-
26	Y	-
27	LG	-
28	BR	-
29	W/B	-
30	Y	-
31	W	-
32	L	- [With Anti-theft diode]
32	LG	- [Without Anti-theft diode]

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	BG	-
6	W/B	-
7	V	-
8	BG	- [With VR30 engine]
8	BR	- [With 2.0L turbo gasoline engine]
9	LG	- [With VR30 engine]
9	P	- [With 2.0L turbo gasoline engine]
10	W	-
11	W	- [With VR30 engine]
11	Y	- [With 2.0L turbo gasoline engine]
12	B	- [With VR30 engine]
12	BR	- [With 2.0L turbo gasoline engine]
13	GR	- [With VR30 engine]
13	SHIELD	- [With 2.0L turbo gasoline engine]
14	B	-
15	BG	- [With 2.0L turbo gasoline engine]
15	SB	- [With VR30 engine]
16	B	- [With 2.0L turbo gasoline engine]
16	BR	- [With VR30 engine]
17	LG	-
18	B	- [With VR30 engine]
18	W/B	- [With 2.0L turbo gasoline engine]
19	Y	-
31	W	-
32	G	- [With 2.0L turbo gasoline engine]
32	V	- [With VR30 engine]
33	L	- [With VR30 engine]
33	Y	- [With 2.0L turbo gasoline engine]
34	P	-
35	BG	-
36	G	-
37	B	- [With VR30 engine]
37	L	- [With 2.0L turbo gasoline engine]
38	L	- [With VR30 engine]
38	P	- [With 2.0L turbo gasoline engine and without gateway]
38	R	- [With 2.0L turbo gasoline engine and with gateway]
39	R	- [With 2.0L turbo gasoline engine]
39	Y	- [With VR30 engine]
40	GR	-
41	L	-
44	BR	-
45	L	- [With 2.0L turbo gasoline engine]
45	W	- [With VR30 engine]
46	G	- [With VR30 engine]
46	Y	- [With 2.0L turbo gasoline engine]
47	BG	- [With 2.0L turbo gasoline engine]
47	R	- [With VR30 engine]
48	SHIELD	-
49	B	- [With VR30 engine]
49	G	- [With 2.0L turbo gasoline engine]
50	B	- [With 2.0L turbo gasoline engine]
50	BR	- [With VR30 engine]
51	L	-
52	W	-
53	G	-
54	SB	- [With 2.0L turbo gasoline engine]
54	Y	- [With VR30 engine]
55	B	- [With 2.0L turbo gasoline engine]

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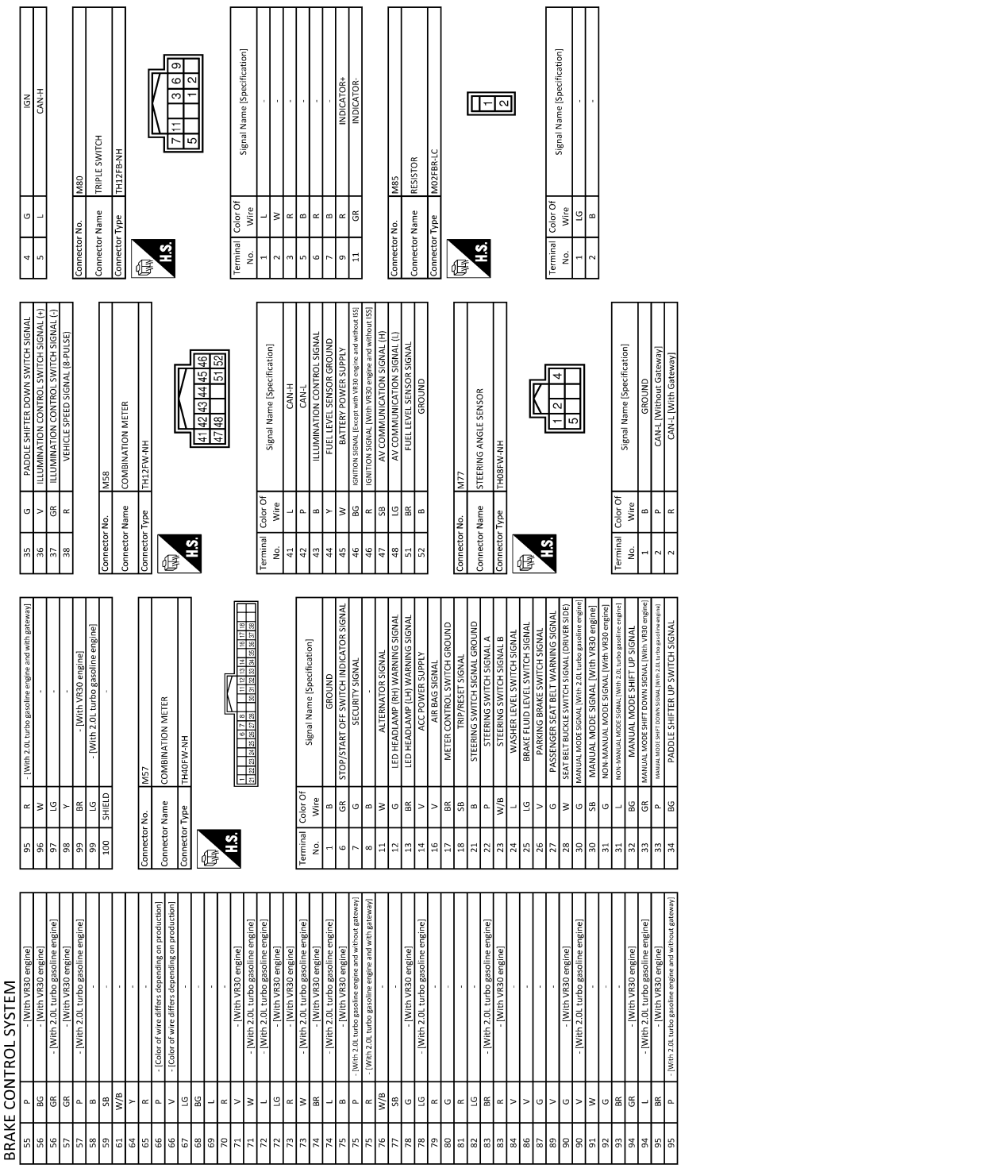

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BRAKE CONTROL SYSTEM

Connector No.	M133
Connector Name	FUSE BLOCK (J/B)
Connector Type	TH40FW-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
10C	V	-
12C	L	-
13C	L	-
14C	Y	-
15C	R	-
16C	R	-
17C	L	-
18C	BG	- [Without DRPO]
18C	P	- [With DRPO]
19C	B	-
1C	R	-
20C	W	-
21C	L	-
22C	L	-
23C	L	-
25C	LG	-
26C	SB	-
27C	P	-
28C	W	-
29C	W	-
2C	R	-
30C	R	-
31C	W	-
32C	R	-
33C	B	- [With VR30 engine]
33C	R	- [With 2.0L turbo gasoline engine]
34C	W/B	-
35C	SB	-
36C	R	-
37C	W	-
38C	SB	-
39C	V	-
3C	P	-
40C	G	-
4C	P	-
5C	P	-

6C	G	-
7C	G	-
8C	G	-
9C	V	-

Connector No.	M137
Connector Name	JOINT CONNECTOR-M10
Connector Type	24342_4GA2A

H.S.

5	4	3	2	1
11	10	9	8	7
	16	15	14	13
	22	21	20	19

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	B	-
3	B	-
4	B	-
5	B	-
7	B	-
8	B	-
9	B	-
10	B	-
11	B	-
13	L	-
14	L	-
15	L	-
16	L	-
19	R	-
20	R	-
21	R	-
22	R	-

Connector No.	M139
Connector Name	DIODE-2
Connector Type	ET02-2W

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	-
2	BG	-

Connector No.	M146
Connector Name	WIRE TO WIRE
Connector Type	TK36MW-NS10

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
5	R	-
8	GR	-
9	V	-
10	BG	-
11	L	-
12	P	-
13	SB	-
14	Y	-
15	G	-
16	BR	-
17	W	-
18	R	-
19	L	-
20	SHIELD	-
21	BR	-
22	B	-
23	G	-
24	L	-

25	R	-
26	G	-
30	Y	-
31	GR	-
32	SB	-
33	BG	-
34	W	-
35	G	-
36	R	-
37	SHIELD	-
38	B	-
39	W	-
40	B	-
41	GR	-
42	B	-
43	LG	-
44	B	-
45	SB	-
46	B	-

Connector No.	M173
Connector Name	JOINT CONNECTOR-M03
Connector Type	24342_4GA2A

H.S.

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

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	R	-
8	R	-
9	R	-
10	R	-
11	R	-
12	R	-
13	SB	-
14	SB	-
15	SB	-

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BRAKE CONTROL SYSTEM

16	L	- [With 2.0L turbo gasoline engine]
16	SB	- [With VR30 engine]
17	L	- [With 2.0L turbo gasoline engine]
17	SB	- [With VR30 engine]
18	L	- [With 2.0L turbo gasoline engine]
18	SB	- [With VR30 engine]
19	BR	- [With VR30 engine]
19	LG	- [With 2.0L turbo gasoline engine]
20	BR	- [With VR30 engine]
20	LG	- [With 2.0L turbo gasoline engine]
21	BR	- [With VR30 engine]
21	LG	- [With 2.0L turbo gasoline engine]
22	R	- [With 2.0L turbo gasoline engine]
22	SB	- [With VR30 engine and without ISS]
22	V	- [With VR30 engine and with ISS]
23	R	- [With 2.0L turbo gasoline engine]
23	SB	- [With VR30 engine and without ISS]
23	V	- [With VR30 engine and with ISS]
24	R	- [With 2.0L turbo gasoline engine]
24	SB	- [With VR30 engine and without ISS]
24	V	- [With VR30 engine and with ISS]

Connector No.	M175
Connector Name	JOINT CONNECTOR-M05
Connector Type	NH20FL-DC

H.S.

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

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	L	-
8	L	-
10	P	-
11	P	-
12	P	-
13	P	-
14	P	-
15	P	-
16	P	- [With VR30 engine]
17	P	- [With 2.0L turbo gasoline engine]
18	P	- [With VR30 engine and with ISS]
19	W	- [Except with VR30 engine and with ISS]
20	R	- [With VR30 engine and with ISS]
20	W	- [Except with VR30 engine and with ISS]

Connector No.	M177
Connector Name	JOINT CONNECTOR-M07
Connector Type	24342_4GA2A

H.S.

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

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	L	-
4	L	-
5	L	-
6	L	-
7	L	-
8	L	-
9	P	-
10	P	-
11	P	-
12	P	-
13	L	-
14	L	-
15	L	-
16	L	-
17	L	-
18	L	-
19	W	-
20	W	-
21	W	-
22	P	-
23	P	-
24	P	-

JRFWC5017GB

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000012793740

DETAILED FLOW

1.INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing BRC-88, "Diagnostic Work Sheet" and reproduce the symptom as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

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

>> GO TO 2.

2.CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by fail-safe mode. Refer to BRC-68, "Fail-Safe".

CAUTION:

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

>> GO TO 3.

3.PERFORM THE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF → ON.
   CAUTION:
   Be sure to wait of 10 seconds after turning ignition switch OFF or ON.
2. Perform self-diagnosis for “ABS”.

Is DTC detected?

YES >> Record or print self-diagnosis results and freeze frame data (FFD). GO TO 4.
NO >> GO TO 6.

4.RECHECK THE SYMPTOM

With CONSULT

1. Erase self-diagnostic results for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   CAUTION:
   Be sure to wait of 10 seconds after turning ignition switch OFF or ON.
3. Perform DTC confirmation procedures for the error-detected system.
   NOTE:
   If some DTCs are detected at the some time, determine the order for performing the diagnosis based on BRC-71, "DTC Inspection Priority Chart".

Is DTC detected?

YES >> GO TO 5.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-45, "Intermittent Incident".

5.REPAIR OR REPLACE ERROR-DETECTED PART

With CONSULT

1. Repair or replace error-detected parts.
2. Reconnect part or connector after repairing or replacing.
3. When DTC is detected, erase self-diagnostic result for “ABS”.

CAUTION:
- **Turn the ignition switch OFF → ON → OFF after erase self-diagnosis result.**
- **Be sure to wait of 10 seconds after turning ignition switch OFF or ON.**

>> GO TO 7.

6. IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

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

Can the error-detected system be identified?

YES >> GO TO 7.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-45, "Intermittent Incident".

7. FINAL CHECK

With CONSULT
1. Check the reference value for “ABS”.
2. Recheck the symptom and check that the symptom is not reproduced on the same conditions.

Is the symptom reproduced?

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

Diagnostic Work Sheet

INFOID:0000000012793741

DESCRIPTION

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

INTERVIEW SHEET SAMPLE

Interview sheet					
Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine/traction Motor		Mileage	km (Mile)
Symptom		☐ Does not operate ( ) function			
		☐ Warning lamp turns ON. ☐ ABS or  ☐ BRAKE or  ☐  ☐  ☐ Other ( )			
		☐ Noise (Location:) ☐ Vibration (Location:)			
		☐ Other ( )			
First occurrence		☐ Recently ☐ Other ( )			
Frequency of occurrence		☐ Always ☐ Under a certain conditions of ☐ Sometimes (time(s)/day)			
Climate conditions		☐ Irrelevant			
	Weather	☐ Fine ☐ Cloud ☐ Rain ☐ Snow ☐ Others ( )			
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold ☐ Temperature [Approx. °C (°F)]			
	Relative humidity	☐ High ☐ Moderate ☐ Low			
Road conditions		☐ Ordinary road ☐ Highway ☐ Mountainous road (uphill or downhill) ☐ Rough road			

Interview sheet

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

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

Description

INFOID:0000000012793742

- When replaced the ABS actuator and electric unit (control unit), perform adjust the neutral position of steering angle sensor. Refer to BRC-94, "Description".
- When replaced the ABS actuator and electric unit (control unit), perform calibration of the decel G sensor. Refer to BRC-94, "Description".
- When replaced the ABS actuator and electric unit (control unit), perform configuration of the ABS actuator and electric unit (control unit) is required. Refer to BRC-96, "Work Procedure".

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:0000000012793743

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

×: Required —: Not required

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

Work Procedure

INFOID:0000000012793744

ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

CAUTION:

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

1.CHECK VEHICLE SPECIFICATIONS

Check vehicle specifications.

Models with direct adaptive steering system>>Refer to STC-203, "Work Procedure". GO TO 4.
Models without direct adaptive steering system>>GO TO 2.

2.CHECK THE VEHICLE STATUS (1)

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

Does the vehicle stay in the straight-ahead position?

YES >> GO TO 3.
NO >> Steer the steering wheel to the straight-ahead position. Stop the vehicle.

3.ADJUST NEUTRAL POSITION OF STEERING ANGLE SENSOR

With CONSULT

1. Turn the ignition switch ON.
   CAUTION:
   Never start engine.
2. Select “ABS”, “WORK SUPPORT” and “ST ANGLE SENSOR ADJUSTMENT” in this order.
3. Select “START”.
   CAUTION:
   Never touch steering wheel while adjusting steering angle sensor.
4. After approx. 10 seconds, select “END”.
5. Turn ignition switch OFF, and then turn it ON again.
   CAUTION:
   Be sure to perform the operation above.

>> GO TO 4.

4.CHECK DATA MONITOR (1)

With CONSULT

1. The vehicle is either pointing straight ahead, or the vehicle needs to be moved. Stop when it is pointing straight ahead.
2. Select “ABS”, “DATA MONITOR”, “ECU INPUT SIGNALS” and “STR ANGLE SIG” in the order. Check that the signal is within the specified value.

STR ANGLE SIG : 0±2.5°

Is the inspection result normal?

YES >> GO TO 11.
NO >> GO TO 5.

5.CHECK STEERING COMPONENT PARTS

Check the installation condition of steering component parts.

- Vehicle speed sensitive power steering system: Refer to ST-31, "Inspection".
- Direct adaptive steering system: Refer to ST-125, "Inspection".

Is the inspection result normal?

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

6.CHECK SUSPENSION COMPONENT PARTS

Check the installation condition of suspension component parts.

- Front
  - 2WD: Refer to FSU-27, "Inspection" (VR30DDTT engine models), FSU-8, "Inspection" (2.0L TURBO engine models).
  - AWD: Refer to FSU-53, "Inspection".
- Rear: Refer to RSU-5, "Inspection".

Is the inspection result normal?

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

7.CHECK WHEEL ALIGNMENT

Check the wheel alignment.

- Front
  - 2WD: Refer to FSU-28, "EXCEPT DIRECT ADAPTIVE STEERING : Inspection" (VR30DDTT engine models with hydraulic pump electric power steering system), FSU-29, "DIRECT ADAPTIVE STEERING : Inspection" (VR30DDTT engine models with direct adaptive steering system), FSU-9, "Inspection" (2.0L TURBO engine models).
  - AWD: Refer to FSU-54, "EXCEPT DIRECT ADAPTIVE STEERING : Inspection" (models with hydraulic pump electric power steering system), FSU-55, "DIRECT ADAPTIVE STEERING : Inspection" (models with direct adaptive steering system).
- Rear: Refer to RSU-6, "Inspection".

Is the inspection result normal?

YES >> Adjust the wheel alignment. GO TO 8.
- Front
  - 2WD: Refer to FSU-29, "EXCEPT DIRECT ADAPTIVE STEERING : Adjustment" (VR30DDTT engine models with hydraulic pump electric power steering system), FSU-30, "DIRECT ADAPTIVE STEERING : Adjustment" (VR30DDTT engine models with direct adaptive steering system), FSU-9, "Adjustment" (2.0L TURBO engine models).
  - AWD: Refer to FSU-55, "EXCEPT DIRECT ADAPTIVE STEERING : Adjustment" (models with hydraulic pump electric power steering system), FSU-55, "DIRECT ADAPTIVE STEERING : Inspection" (models with direct adaptive steering system).
- Rear: Refer to RSU-6, "Adjustment".

8.CHECK THE VEHICLE STATUS (2)

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

Does the vehicle stay in the straight-ahead position?

YES >> GO TO 9.
NO >> Steer the steering wheel to the straight-ahead position. Stop the vehicle. GO TO 9.

9. CHECK DATA MONITOR (2)

With CONSULT

1. The vehicle is either pointing straight ahead, or the vehicle needs to be moved. Stop when it is pointing straight ahead.
2. Select “ABS”, “DATA MONITOR”, “ECU INPUT SIGNALS” and “STR ANGLE SIG” in the order. Check that the signal is within the specified value.

STR ANGLE SIG : 0±2.5°

Is the inspection result normal?

YES >> GO TO 11.
NO >> GO TO 10.

10. CHECK DATA MONITOR (3)

With CONSULT

1. The vehicle is either pointing straight ahead, or the vehicle needs to be moved.
   CAUTION:
   - **Drive the vehicle at approx. 30 km/h (19MPH) or more for 300 m (985 ft) or more.**
   - **Never use tester**
2. The vehicle is either pointing straight ahead, or the vehicle needs to be moved. Stop when it is pointing straight ahead.
3. Select “ABS”, “DATA MONITOR”, “ECU INPUT SIGNALS” and “STR ANGLE SIG” in the order. Check that the signal is within the specified value.

STR ANGLE SIG : 0±2.5°

Is the inspection result normal?

YES >> GO TO 11.
NO >> GO TO 1.

11. ERASE SELF-DIAGNOSIS MEMORY

With CONSULT

1. Erase self-diagnosis result of “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   CAUTION:
   Be sure to wait for 10 seconds or more after turning the ignition switch OFF or ON.

Are the memories erased?

YES >> INSPECTION END
NO >> Check the items indicated by the self-diagnosis.

CALIBRATION OF DECEL G SENSOR

Description

INFOID:0000000012793745

CAUTION:
Always perform the decel G sensor calibration before driving when the following operation is performed. Refer to BRC-94, "Work Procedure"
NOTE:
Yaw rate/side/decel G sensor calibration is performed when performing the decel G sensor calibration.

×: Required —: Not required

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

Work Procedure

INFOID:0000000012793746

Decel G sensor calibration

CAUTION:
Always use CONSULT for the decel G sensor calibration. (It cannot be adjusted other than with CONSULT.)
NOTE:
Yaw rate/side/decel G sensor calibration is performed when performing the decel G sensor calibration.

1.CHECK THE VEHICLE STATUS

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

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

YES >> GO TO 2.
NO >> Steer the steering wheel to the straight-ahead position. Stop the vehicle on level surface.

2.PERFORM DECEL G SENSOR CALIBRATION

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

With CONSULT
1. Turn the ignition switch ON.
   CAUTION:
   Never start engine.
2. Select “ABS”, “WORK SUPPORT”, “DECEL G SENSOR CALIBRATION” in this order.
3. Select “START”.
4. After approx. 10 seconds, select “END”.
5. Turn ignition switch OFF and then turn it ON again.
   CAUTION:
   Be sure to perform the operation above.

>> GO TO 3.

3.CHECK DATA MONITOR

With CONSULT

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

DECEL G SENSOR : Approx. 0 m/s^2

Is the inspection result normal?

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

4.ERASE SELF-DIAGNOSIS MEMORY

With CONSULT

Erase self-diagnosis result of “ABS”.

Are the memories erased?

YES >> INSPECTION END
NO >> Check the items indicated by the self-diagnosis.

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

Work Procedure

INFOID:0000000012793747

CAUTION:
- **Use “Manual Configuration” only when “TYPE ID” of ABS actuator and electric unit (control unit) cannot be read.**
- **After configuration, turn the ignition switch from OFF to ON and check that the VDC warning lamp turns OFF after staying illuminated for approximately two seconds.**
- **If an error occurs during configuration, start over from the beginning.**

1. CHECKING TYPE ID (1)

Use FAST (service parts catalogue) to search ABS actuator and electric unit (control unit) of the applicable vehicle and find “Type ID”.

Is “Type ID” displayed?

YES >> Print out “Type ID” and GO TO 2.
NO >> “Configuration” is not required for ABS actuator and electric unit (control unit). Replace in the usual manner. Refer to BRC-195, "Removal and Installation".

2. CHECKING TYPE ID (2)

CONSULT Configuration
1. Select “Before Replace ECU” of “Read/Write Configuration”.
2. Check that “Type ID” is displayed on the CONSULT screen.

Is “Type ID” displayed?

YES >> GO TO 3.
NO >> GO TO 7.

3. VERIFYING TYPE ID (1)

CONSULT Configuration
Compare a “Type ID” displayed on the CONSULT screen with the one searched by using FAST (service parts catalogue) to check that these “Type ID” agree with each other.

NOTE:
For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 4.

4. SAVING TYPE ID

CONSULT Configuration
Save “Type ID” on CONSULT.

>> GO TO 5.

5. REPLACING ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (1)

Replace ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

CAUTION:
Never perform the following work items:
- **Air bleeding**
- **Calibration of decel G sensor**

>> GO TO 6.

6. WRITING (AUTOMATIC WRITING)

CONSULT Configuration
1. Select “After Replace ECU” of “Re/programming, Configuration” or that of “Read / Write Configuration”.
2. Select the “Type ID” agreeing with the one stored on CONSULT and the one searched by using FAST (service parts catalogue) to write the “Type ID” into the ABS actuator and electric unit (control unit).

NOTE:
For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 9.

7. REPLACING ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (2)

Replace ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

CAUTION:
Never perform the following work items:
- **Air bleeding**
- **Calibration of decel G sensor**

>> GO TO 8.

8. WRITING (MANUAL WRITING)

CONSULT Configuration
1. Select “Manual Configuration”.
2. Select the “Type ID” searched by using FAST (service parts catalogue) to write the “Type ID” into the ABS actuator and electric unit (control unit).
   NOTE:
   For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 9.

9. VERIFYING TYPE ID (2)

Compare “Type ID” written into the ABS actuator and electric unit (control unit) with the one searched by using FAST (service parts catalogue) to check that these “Type ID” agree with each other.

NOTE:
For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 10.

10. CHECKING VDC WARNING LAMP

1. Turn the ignition switch OFF.
2. Turn the ignition switch ON and check that the VDC warning lamp turns OFF after staying illuminated for approximately two seconds.
   CAUTION:
   Never start the engine.

Is the inspection result normal?

YES >> GO TO 11.
NO >> Perform the self-diagnosis of “ABS”. Refer to BRC-61, "CONSULT Function".

11. PERFORMING SUPPLEMENTARY WORK

1. Perform the air bleeding. Refer to BR-17, "Bleeding Brake System".
2. Perform the adjustment of steering angle sensor neutral position. Refer to BRC-91, "Work Procedure".
3. Perform the calibration of decel G sensor. Refer to BRC-94, "Work Procedure".
4. Perform the self-diagnosis of all systems.
5. Erase self-diagnosis results.

>> End of work.

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Description

INFOID:0000000012793748

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• Harness or connector • Wheel sensor • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • Vehicle was not driven after previous repair

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- ABS function
- EBD function (only when both 2 rear wheels are malfunctioning)
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active Trace Control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

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

4. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
5. Start the engine.
NOTE:
Wait at least 10 seconds after start the engine.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

YES-1 >> “C1101”, “C1102”, “C1103” or “C1104” is displayed by “CRNT”: Proceed to BRC-99, "Diagnosis Procedure".
YES-2 >> “C1101”, “C1102”, “C1103” and “C1104” are displayed by “PAST”: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793749

CAUTION:
Never check between wheel sensor harness connector terminals.

1.CHECK WHEEL SENSOR

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

Is the inspection result normal?

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

2.REPLACE WHEEL SENSOR (1)

With CONSULT
1. Replace the wheel sensor.
- Front: Refer to BRC-191, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-192, "REAR WHEEL SENSOR : Removal and Installation".
2. Erase self-diagnosis result for “ABS”.
3. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
6. Stop the vehicle.
7. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
8. Start the engine.
NOTE:
Wait at least 10 seconds after start the engine.
9. Perform self-diagnosis for “ABS”.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

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

3.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 4.

4. PERFORM SELF-DIAGNOSIS (1)

With CONSULT
1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.
5. Stop the vehicle.
6. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
7. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
8. Perform self-diagnosis for “ABS”.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

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

6. CHECK TERMINAL

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

Is the inspection result normal?

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

7. PERFORM SELF-DIAGNOSIS (2)

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

Wait at least 10 seconds after start the engine.

10. Perform self-diagnosis for “ABS”.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

YES >> GO TO 8.
NO >> INSPECTION END

8. CHECK WHEEL SENSOR HARNESS

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

- Measurement connector and terminal for power supply circuit

ABS actuator and electric unit (control unit)		Wheel sensor			Continuity
Connector	Terminal	Connector		Terminal	
E35	20	E48	(Front LH wheel)	2	Existed
	10	E54	(Front RH wheel)		
	8	C6	(Rear LH wheel)		
	18	C5	(Rear RH wheel)		

- Measurement connector and terminal for signal circuit

ABS actuator and electric unit (control unit)		Wheel sensor			Continuity
Connector	Terminal	Connector		Terminal	
E35	19	E48	(Front LH wheel)	1	Existed
	9	E54	(Front RH wheel)		
	7	C6	(Rear LH wheel)		
	17	C5	(Rear RH wheel)		

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair / replace harness or connector, and GO TO 9.

9. PERFORM SELF-DIAGNOSIS (3)

With CONSULT

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

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

YES >> GO TO 10.
NO >> INSPECTION END

10. CHECK WHEEL SENSOR OUTPUT SIGNAL

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

Does the ABS active wheel sensor tester detect a signal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> GO TO 11.

11. REPLACE WHEEL SENSOR

With CONSULT
1. Replace the wheel sensor.
- Front: Refer to BRC-191, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-192, "REAR WHEEL SENSOR : Removal and Installation".
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.
7. Stop the vehicle.
8. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
9. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
10. Perform self-diagnosis for “ABS”.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> INSPECTION END

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Description

INFOID:0000000012793750

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1105	RR RH SENSOR-2 (Rear RH wheel sensor-2)	• When power supply voltage of rear RH wheel sensor is low. • When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. • When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. • When there is contamination on or damage to the rear RH wheel sensor or rear RH sensor rotor.
C1106	RR LH SENSOR-2 (Rear LH wheel sensor-2)	• When power supply voltage of rear LH wheel sensor is low. • When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. • When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. • When there is contamination on or damage to the rear LH wheel sensor or rear LH sensor rotor.
C1107	FR RH SENSOR-2 (Front RH wheel sensor-2)	• When power supply voltage of front RH wheel sensor is low. • When distance between front RH wheel sensor and front RH wheel sensor rotor is large. • When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. • When there is contamination on or damage to the front RH wheel sensor or front RH sensor rotor.
C1108	FR LH SENSOR-2 (Front LH wheel sensor-2)	• When power supply voltage of front LH wheel sensor is low. • When distance between front LH wheel sensor and front LH wheel sensor rotor is large. • When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. • When there is contamination on or damage to the front LH wheel sensor or front LH sensor rotor.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
• Harness or connector • Wheel sensor • Sensor rotor • Tire size • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• Harness or connector • Wheel sensor • Sensor rotor • ABS actuator and electric unit (control unit) • Tire size • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • Vehicle was not driven after previous repair

FAIL-SAFE

The following functions are suspended.

- VDC function
- TCS function
- ABS function
- EBD function (only when both 2 rear wheels are malfunctioning)
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
5. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES-1 >> “C1105”, “C1106”, “C1107” or “C1108” is displayed by “CRNT”: Proceed to BRC-104, "Diagnosis Procedure".
YES-2 >> “C1105”, “C1106”, “C1107” and “C1108” are displayed by “PAST”: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793751

CAUTION:
Never check between wheel sensor harness connector terminals.

1.CHECK WHEEL HUB ASSEMBLY

Check that there is no excessive looseness in wheel hub assembly.
- Front
  - 2WD models: Refer to FAX-7, "Inspection".
  - AWD models: Refer to FAX-17, "Inspection".
- Rear: Refer to RAX-6, "Inspection".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the wheel hub assembly, and GO TO 2.
- Front
  - 2WD models: Refer to FAX-8, "Removal and Installation".
  - AWD models: Refer to FAX-19, "Removal and Installation".
- Rear: Refer to RAX-8, "Removal and Installation".

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness, connector, fuse, or fusible link.

3.CHECK TIRE

1. Turn the ignition switch OFF.
2. Check the tire air pressure, wear and size. Refer to WT-82, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Adjust air pressure or replace tire, and GO TO 4.

4. CHECK DATA MONITOR (1)

With CONSULT
1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR”.
   NOTE:
   Set the “DATA MONITOR” recording speed to “10 msec”.
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

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

5. PERFORM SELF-DIAGNOSIS (1)

With CONSULT
1. Stop the vehicle.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES >> GO TO 6.
NO >> INSPECTION END

6. CHECK WHEEL SENSOR AND SENSOR ROTOR

1. Turn the ignition switch OFF.
2. Disconnect wheel sensor harness connector.
3. Remove dust and foreign matter adhered to the wheel sensor and sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.
   CAUTION:
   Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque.
   - **Front: Refer to BRC-191, "FRONT WHEEL SENSOR : Exploded View".**
   - **Rear: Refer to BRC-192, "REAR WHEEL SENSOR : Exploded View".**

>> GO TO 7.

7. CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 8.
NO >> GO TO 9.

8. CHECK WHEEL SENSOR OUTPUT SIGNAL

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

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

4. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash ON and OFF to indicate an output signal.
   NOTE:
   If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 12.
NO >> GO TO 9.

9. REPLACE WHEEL SENSOR (1)

With CONSULT

1. Replace the wheel sensor.
- Front: Refer to BRC-191, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-192, "REAR WHEEL SENSOR : Removal and Installation".
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR”.
   NOTE:
   Set the “DATA MONITOR” recording speed to “10 msec”.
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 10.
NO >> GO TO 20.

10. PERFORM SELF-DIAGNOSIS (2)

With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

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

11. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 14.
NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 12.

12. CHECK DATA MONITOR (2)

With CONSULT

1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR”.
   NOTE:
   Set the “DATA MONITOR” recording speed to “10 msec”.
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

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

13. PERFORM SELF-DIAGNOSIS (3)

With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES >> GO TO 14.
NO >> INSPECTION END

14. CHECK TERMINAL

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

Is the inspection result normal?

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

15. CHECK DATA MONITOR (3)

With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR”.
   NOTE:
   Set the “DATA MONITOR” recording speed to “10 msec”.
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

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

16. PERFORM SELF-DIAGNOSIS (4)

With CONSULT
1. Stop the vehicle.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

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

17. CHECK WHEEL SENSOR HARNESS

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	20, 19	Ground	Not existed
	10, 9		
	8, 7		
	18, 17		

Is the inspection result normal?

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

18. CHECK DATA MONITOR (4)

With CONSULT
1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR”.
   NOTE:
   Set the “DATA MONITOR” recording speed to “10 msec”.
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 19.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

19. PERFORM SELF-DIAGNOSIS (5)

With CONSULT
1. Stop the vehicle.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> INSPECTION END

20. REPLACE SENSOR ROTOR

With CONSULT
1. Replace the sensor rotor.
- Front: Refer to BRC-194, "FRONT SENSOR ROTOR : Removal and Installation".
- Rear: Refer to BRC-194, "REAR SENSOR ROTOR : Removal and Installation".
2. Erase self-diagnosis result for “ABS”.
3. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.
6. Stop the vehicle.
7. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
8. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
9. Perform self-diagnosis for “ABS”.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> INSPECTION END

C1109 POWER AND GROUND SYSTEM

DTC Description

INFOID:0000000012793752

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1109	BATTERY VOLTAGE [ABNORMAL] (Battery voltage [abnormal])	When ignition power supply voltage is in following state. • Ignition power supply voltage: 10 V ≥ ignition power supply voltage. • Ignition power supply voltage: 16 V ≤ ignition power supply voltage.

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • Charge system	• Harness or connector • ABS actuator and electric unit (control unit) • IPDM E/R • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • Charge system

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- ABS function
- EBD function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1109” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-111, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793753

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1109” detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair / replace harness, connector, or terminal.

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Description

INFOID:0000000012793754

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

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

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- ABS function
- EBD function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF → ON, and wait 30 seconds.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
5. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1111” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-113, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793755

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT
1. Turn the ignition switch OFF → ON, and wait 30 seconds.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.
3. Stop the vehicle.
4. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
5. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1111” detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

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

4.ERASE SELF-DIAGNOSIS RESULT (1)

With CONSULT
1. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.
2. Stop the vehicle.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.

>> INSPECTION END

5.CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

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

6. ERASE SELF-DIAGNOSIS RESULT (2)

With CONSULT

1. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.
2. Stop the vehicle.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.

>> INSPECTION END

C1115 WHEEL SENSOR

DTC Description

INFOID:0000000012793756

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

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

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- ABS function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
5. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1115” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-116, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793757

CAUTION:
Never check between wheel sensor harness connector terminals.

1.CHECK TIRE

Check the tire air pressure, wear and size. Refer to WT-82, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Adjust air pressure or replace tire and GO TO 2.

2.CHECK DATA MONITOR (1)

With CONSULT
1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR”.
   NOTE:
   Set the “DATA MONITOR” recording speed to “10 msec”.
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 3.
NO >> GO TO 4.

3.PERFORM SELF-DIAGNOSIS (1)

With CONSULT
1. Stop the vehicle.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1115” detected?

YES >> GO TO 4.
NO >> INSPECTION END

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair / replace harness, connector, fuse, or fusible link.

5. CHECK WHEEL SENSOR AND SENSOR ROTOR

1. Turn the ignition switch OFF.
2. Disconnect wheel sensor harness connector.
3. Remove dust and foreign matter adhered to the wheel sensor and sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.
   CAUTION:
   Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque.
   - **Front: Refer to BRC-191, "FRONT WHEEL SENSOR : Exploded View".**
   - **Rear: Refer to BRC-192, "REAR WHEEL SENSOR : Exploded View".**

>> GO TO 6.

6. CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

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

7. CHECK WHEEL SENSOR OUTPUT SIGNAL

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 11.
NO >> GO TO 8.

8. REPLACE WHEEL SENSOR (1)

With CONSULT
1. Replace the wheel sensor.
- Front: Refer to BRC-191, "FRONT WHEEL SENSOR : Removal and Installation"
- Rear: Refer to BRC-192, "REAR WHEEL SENSOR : Removal and Installation".
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR”.
   NOTE:
   Set the “DATA MONITOR” recording speed to “10 msec”.
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 9.
NO >> GO TO 19.

9. PERFORM SELF-DIAGNOSIS (2)

With CONSULT
1. Stop the vehicle.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1115” detected?

YES >> GO TO 10.
NO >> INSPECTION END

10. CHECK CONNECTOR

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

Is the inspection result normal?

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

11. CHECK DATA MONITOR (2)

With CONSULT
1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR”.
   NOTE:
   Set the “DATA MONITOR” recording speed to “10 msec”.
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

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

12. PERFORM SELF-DIAGNOSIS (3)

With CONSULT
1. Stop the vehicle.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1115” detected?

YES >> GO TO 13.
NO >> INSPECTION END

13. CHECK TERMINAL

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

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

14. CHECK DATA MONITOR (3)

With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR”.
   NOTE:
   Set the “DATA MONITOR” recording speed to “10 msec”.
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

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

15. PERFORM SELF-DIAGNOSIS (4)

With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1115” detected?

YES >> GO TO 16.
NO >> INSPECTION END

16. CHECK WHEEL SENSOR HARNESS

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

- Measurement connector and terminal for power supply circuit

ABS actuator and electric unit (control unit)		Wheel sensor			Continuity
Connector	Terminal	Connector		Terminal	
E35	20	E48	(Front LH wheel)	2	Existed
	10	E54	(Front RH wheel)		
	8	C6	(Rear LH wheel)		
	18	C5	(Rear RH wheel)		

- Measurement connector and terminal for signal circuit

ABS actuator and electric unit (control unit)		Wheel sensor			Continuity
Connector	Terminal	Connector		Terminal	
E35	19	E48	(Front LH wheel)	1	Existed
	9	E54	(Front RH wheel)		
	7	C6	(Rear LH wheel)		
	17	C5	(Rear RH wheel)		

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	20, 19	Ground	Not existed
	10, 9		
	8, 7		
	18, 17		

Is the inspection result normal?

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

17. CHECK DATA MONITOR (4)

With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR”.
   NOTE:
   Set the “DATA MONITOR” recording speed to “10 msec”.
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 18.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

18. PERFORM SELF-DIAGNOSIS (5)

With CONSULT
1. Stop the vehicle.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1115” detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> INSPECTION END

19. REPLACE SENSOR ROTOR

With CONSULT
1. Replace the sensor rotor.
- Front: Refer to BRC-194, "FRONT SENSOR ROTOR : Removal and Installation".
- Rear: Refer to BRC-194, "REAR SENSOR ROTOR : Removal and Installation".
2. Erase self-diagnosis result for “ABS”.
3. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.
6. Stop the vehicle.
7. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
8. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
9. Perform self-diagnosis for “ABS”.

Is DTC “C1115” detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> INSPECTION END

C1116 STOP LAMP SWITCH

DTC Description

INFOID:0000000012793758

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • Stop lamp switch signal circuit	• Harness or connector • Stop lamp switch • ABS actuator and electric unit (control unit) • Resistor (models with ICC) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

FAIL-SAFE

- VDC function
- TCS function
- ABS function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function.
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the ignition switch OFF, and wait 10 seconds or more.
2. Start the engine.
   NOTE:
   Stop the vehicle.
3. Wait 1 minute or more.
   NOTE:
   Never depress brake pedal.
4. Depress brake pedal by 100 mm (3.94 in) or more, and maintain at that position for a minimum of 1 minute or more.
5. Release brake pedal, and wait 1 minute or more.
6. Repeat step 4 to 5 ten or more times.
7. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
9. Perform self-diagnosis for “ABS”.

Is DTC “C1116” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-123, "Diagnosis Procedure"
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793759

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

1.INTERVIEW FROM THE CUSTOMER

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

Is there such a history?

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

2.PERFORM SELF-DIAGNOSIS

With CONSULT
1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
   NOTE:
   Stop the vehicle.
4. Depress the brake pedal several times.
5. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
6. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
7. Perform self-diagnosis for “ABS”.

Is DTC “C1116” detected?

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

3.STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamp turns ON.

Does stop lamp turn ON?

YES >> GO TO 5.
NO >> Check the stop lamp system circuit. GO TO 4.

4.CHECK DATA MONITOR (1)

With CONSULT
1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
   NOTE:
   Stop the vehicle.

4. Select “ABS”, “DATA MONITOR” and “STOP LAMP SW” according to this order. Check that data monitor displays “On” or “Off” when brake pedal is depressed or released. Refer to BRC-66, "Reference Value".
5. Select “ABS”, “DATA MONITOR” and “PRESS SENSOR” according to this order. Depress the brake pedal and check if “PRESSURE SENSOR” indicates “5 bar” or less when “STOP LAMP SW” of “DATA MONITOR” turns from “Off” to “On”. Refer to BRC-66, "Reference Value".

Is the inspection result normal?

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

5.CHECK CONNECTOR

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

Is the inspection result normal?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair / replace harness, connector, fuse, or fusible link.

7.CHECK STOP LAMP SWITCH CLEARANCE

1. Turn the ignition switch OFF.
2. Check the stop lamp switch clearance. Refer to BR-12, "Inspection and Adjustment".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Adjust stop lamp switch clearance. Refer to BR-12, "Inspection and Adjustment". GO TO 8.

8.CHECK DATA MONITOR (2)

With CONSULT
1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
   NOTE:
   Stop the vehicle.
4. Select “ABS”, “DATA MONITOR” and “STOP LAMP SW” according to this order. Check that data monitor displays “On” or “Off” when brake pedal is depressed or released. Refer to BRC-66, "Reference Value".
5. Select “ABS”, “DATA MONITOR” and “PRESS SENSOR” according to this order. Depress the brake pedal and check if “PRESSURE SENSOR” indicates “5 bar” or less when “STOP LAMP SW” of “DATA MONITOR” turns from “Off” to “On”. Refer to BRC-66, "Reference Value".

Is the inspection result normal?

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

9.CHECK STOP LAMP SWITCH

Check the stop lamp switch. Refer to BRC-127, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10.
NO >> Replace the stop lamp switch. Refer to BR-24, "Removal and Installation". GO TO 10.

10.CHECK DATA MONITOR (3)

With CONSULT

1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
   NOTE:
   Start the vehicle.
4. Select “ABS”, “DATA MONITOR” and “STOP LAMP SW” according to this order. Check that data monitor displays “On” or “Off” when brake pedal is depressed or released.Refer to BRC-66, "Reference Value".
5. Select “ABS”, “DATA MONITOR” and “PRESS SENSOR” according to this order. Depress the brake pedal and check if “PRESSURE SENSOR” indicates “5 bar” or less when “STOP LAMP SW” of “DATA MONITOR” turns from “Off” to “On”. Refer to BRC-66, "Reference Value".

Is the inspection result normal?

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

11. CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

YES >> GO TO 13.
NO >> Repair / replace harness, connector, or terminal, and GO TO 12.

12. CHECK DATA MONITOR (4)

With CONSULT
1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect stop lamp switch harness connector.
3. Connect resistor harness connector. (Models with ICC)
4. Erase self-diagnosis result for “ABS”.
5. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
6. Start the engine.
   NOTE:
   Stop the vehicle.
7. Select “ABS”, “DATA MONITOR” and “STOP LAMP SW” according to this order. Check that data monitor displays “On” or “Off” when brake pedal is depressed or released. Refer to BRC-66, "Reference Value".
8. Select “ABS”, “DATA MONITOR” and “PRESS SENSOR” according to this order. Depress the brake pedal and check if “PRESSURE SENSOR” indicates “5 bar” or less when “STOP LAMP SW” of “DATA MONITOR” turns from “Off” to “On”. Refer to BRC-66, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 13.

13. CHECK STOP LAMP SWITCH CIRCUIT (1)

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

+		–	Condition	Voltage
ABS actuator and electric unit (control unit)				
Connector	Terminal			
E35	5	Ground	Brake pedal depressed	10 – 16 V
			Brake pedal not depressed	Approx. 0 V

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

NO (Models with ICC)>>Repair / replace harness or connector, and GO TO 14.

NO (Models without ICC)>>Repair / replace harness or connector, and GO TO 15.

14. CHECK STOP LAMP SWITCH CIRCUIT (2) (MODELS WITH ICC)

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

ABS actuator and electric unit (control unit)		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
E35	5	E57	2	Existed

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

ABS actuator and electric unit (control unit)		Resister		Continuity
Connector	Terminal	Connector	Terminal	
E35	5	M85	1	Existed

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	5	Ground	Not existed

7. Check the continuity between resister and the ground.

Resister		—	Continuity
Connector	Terminal		
M85	1	Ground	Not existed
	2		Existed

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

NO >> Repair / replace harness or connector, and GO TO 16.

15. CHECK STOP LAMP SWITCH CIRCUIT (2) (MODELS WITHOUT ICC)

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

ABS actuator and electric unit (control unit)		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
E35	5	E57	4	Existed

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	5	Ground	Not existed

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair / replace harness or connector, and GO TO 16.

16. CHECK DATA MONITOR (5)

With CONSULT
1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect stop lamp switch harness connector.
3. Connect resister harness connector. (Models with ICC)
4. Erase self-diagnosis result for “ABS”.
5. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
6. Start the engine.
   NOTE:
   Stop the vehicle.
7. Select “ABS”, “DATA MONITOR” and “STOP LAMP SW” according to this order. Check that data monitor displays “On” or “Off” when brake pedal is depressed or released. Refer to BRC-66, "Reference Value".
8. Select “ABS”, “DATA MONITOR” and “PRESS SENSOR” according to this order. Depress the brake pedal and check if “PRESSURE SENSOR” indicates “5 bar” or less when “STOP LAMP SW” of “DATA MONITOR” turns from “Off” to “On”. Refer to BRC-66, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

Component Inspection

INFOID:0000000012793760

1. CHECK STOP LAMP SWITCH

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

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

*1: Models with ICC
*2: Models without ICC

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the stop lamp switch. Refer to BR-24, "Removal and Installation".

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Description

INFOID:0000000012793761

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

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

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- ABS function
- EBD function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1120”, “C1122”, “C1124” or “C1126” detected?

YES-1 >> “C1120”, “C1122”, “C1124” or “C1126” is displayed by “CRNT”: Proceed to BRC-129, "Diagnosis Procedure".
YES-2 >> “C1120”, “C1122”, “C1124” or “C1126” is displayed by “PAST”: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793762

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1120”, “C1122”, “C1124” or “C1126” detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair / replace harness, connector, or terminal.

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Description

INFOID:0000000012793763

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

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

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- ABS function
- EBD function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1121”, “C1123”, “C1125” or “C1127” detected?

YES-1 >> “C1121”, “C1123”, “C1125” or “C1127” is displayed by “CRNT”: Proceed to BRC-131, "Diagnosis Procedure".
YES-2 >> “C1121”, “C1123”, “C1125” and “C1127” are displayed by “PAST”: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793764

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1121”, “C1123”, “C1125” or “C1127” detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair / replace harness, connector, or terminal.

C1130 ENGINE SIGNAL

DTC Description

INFOID:0000000012793765

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

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

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- Brake limited slip differential (BLSD) function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1130” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-133, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793766

1.CHECK ENGINE SYSTEM

With CONSULT

Perform self-diagnosis for “ENGINE”.

- VR30DDTT engine models for USA and Canada: Refer to EC6-115, "CONSULT Function".
- VR30DDTT engine models for Mexico: Refer to EC6-1093, "CONSULT Function".
- 2.0L TURBO engine models: Refer to EC4-101, "CONSULT Function".

Is DTC detected?

YES >> Check the DTC.
- VR30DDTT engine models for USA and Canada: Refer to EC6-164, "TURBO HIGH PRESSURE MODEL : DTC Index".
- VR30DDTT engine models for Mexico: Refer to EC6-1139, "DTC Index".
- 2.0L TURBO engine models: Refer to EC4-146, "DTC Index".

NO >> GO TO 2.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness, connector, fuse, or fusible link.

3.CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

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

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

With CONSULT

1. Connect ECM harness connector.
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
5. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1130” or “U1000”detected?

YES (“C1130”)>>Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
YES (“U1000”)>>Refer to LAN-41, "Trouble Diagnosis Flow Chart".
NO >> INSPECTION END

C1138 STEERING SYSTEM

DTC Description

INFOID:0000000012793767

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1138	4WAS CIRCUIT (4WAS circuit)	When a malfunction is detected in direct adaptive steering system.

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • CAN communication line • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• Harness or connector • CAN communication line • Direct adaptive steering system • ABS actuator and electric unit (control unit)

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- Brake limited slip differential (BLSD) function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1138” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-135, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793768

1. CHECK DIRECT ADAPTIVE STEERING SYSTEM

With CONSULT

1. Perform self-diagnosis for “EPS/DAST 3”. Refer to STC-131, "CONSULT Function".
2. Perform self-diagnosis for “DAST 1”. Refer to STC-136, "CONSULT Function".
3. Perform self-diagnosis for “DAST 2”. Refer to STC-141, "CONSULT Function".

Is DTC detected?

YES >> Check the DTC.
- “EPS/DAST 3”: Refer to STC-156, "DTC Index".
- “DAST 1”: Refer to STC-169, "DTC Index".
- “DAST 2”: Refer to STC-182, "DTC Index".

NO >> GO TO 2.

2. CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness, connector, or terminal, securely lock the connector, and GO TO 3.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Connect steering force control module harness connector.
2. Connect steering angle main control module harness connector.
3. Connect steering angle sub control module harness connector.
4. Connect ABS actuator and electric unit (control unit) harness connector.
5. Erase self-diagnosis result for “ABS”.
6. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
7. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
8. Perform self-diagnosis for “ABS”.

Is DTC “C1138” or “U1000” detected?

YES (“C1138”)>>Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
YES (“U1000”)>>Refer to LAN-41, "Trouble Diagnosis Flow Chart".
NO >> INSPECTION END

C1140 ACTUATOR RELAY SYSTEM

DTC Description

INFOID:0000000012793769

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

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

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- ABS function
- EBD function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1140” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-137, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793770

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1140” detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair / replace harness, connector, or terminal.

C1142 PRESS SENSOR

DTC Description

INFOID:0000000012793771

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • Air inclusion in the brake piping • Stop lamp switch system • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• Stop lamp switch system • ABS actuator and electric unit (control unit) • Brake system • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • Air inclusion in the brake piping

FAIL-SAFE

To following functions are suspended.
- VDC function
- TCS function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1142” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-139, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793772

1.STOP LAMP SWITCH SYSTEM

Check the stop lamp switch system. Refer to BRC-123, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace stop lamp switch system.

2.CHECK BRAKE FLUID LEAKAGE

Check the brake fluid leakage. Refer to BR-16, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace brake fluid leakage part.

3.CHECK BRAKE PIPING

Check the brake piping.
- Front: Refer to BR-34, "FRONT : Inspection".
- Rear: Refer to BR-41, "REAR : Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace brake piping.
- Front: Refer to BR-28, "FRONT : Removal and Installation".
- Rear: Refer to BR-36, "REAR : Removal and Installation".

4.CHECK BRAKE PEDAL

Check the brake pedal.
- Brake pedal height: Refer to BR-12, "Inspection and Adjustment".
- Brake pedal assembly: Refer to BR-25, "Inspection and Adjustment".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Adjust the brake pedal height or replace brake pedal assembly.
- Adjust the brake pedal: Refer to BR-12, "Inspection and Adjustment".
- Replace the brake pedal: Refer to BR-24, "Removal and Installation".

5.CHECK BRAKE MASTER CYLINDER

Check the brake master cylinder. Refer to BR-18, "Inspection".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace brake master cylinder. Refer to BR-42, "Removal and Installation".

6.CHECK BRAKE BOOSTER

Check the brake booster. Refer to BR-19, "Inspection".

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace brake booster. Refer to BR-46, "Removal and Installation".

7.CHECK VACUUM PIPING

Check the vacuum piping. Refer to BR-50, "2.0L TURBO GASOLINE ENGINE : Inspection".

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace vacuum piping. Refer to BR-49, "2.0L TURBO GASOLINE ENGINE : Removal and Installation".

8.CHECK FRONT DISC BRAKE

Check the front disc brake.
- Brake caliper 2 piston type: Refer to BR-61, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection".
- Brake caliper 4 piston type: Refer to BR-66, "BRAKE CALIPER ASSEMBLY (4 PISTON TYPE) : Inspection".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair or replace front disc brake.
- Brake caliper 2 piston type: Refer to BR-58, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Removal and Installation".
- Brake caliper 4 piston type: Refer to BR-63, "BRAKE CALIPER ASSEMBLY (4 PISTON TYPE) : Removal and Installation".

9. CHECK REAR DISC BRAKE

Check the rear disc brake.
- Brake caliper 1 piston type: Refer to BR-77, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection".
- Brake caliper 2 piston type: Refer to BR-81, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection".

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair or replace rear disc brake.
- Brake caliper 1 piston type: Refer to BR-73, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Removal and Installation".
- Brake caliper 2 piston type: Refer to BR-79, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Removal and Installation".

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 11.
NO >> Repair / replace harness, connector, fuse, or fusible link.

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

With CONSULT
1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Start the engine and drive the vehicle for a short period of time.
   NOTE:
   Vehicle must be driven after repair or replacement to erase the previous DTCs.
5. Stop the vehicle.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1142” detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Check the ABS actuator and electric unit (control unit) harness connector and terminal for damage, looseness and disconnection. Repair / replace harness, connector, or terminal.

C1143 STEERING ANGLE SENSOR

DTC Description

INFOID:0000000012793773

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • CAN communication line • Incomplete neutral position adjustment of steering angle sensor • Improper installation of steering angle sensor	• Harness or connector • Steering angle sensor • ABS actuator and electric unit (control unit) • IPDM E/R • CAN communication line • Wheel alignment • Incomplete neutral position adjustment of steering angle sensor • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- Brake limited slip differential (BLSD) function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1143” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-142, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793774

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

With CONSULT
Perform neutral position adjustment of steering angle sensor. Refer to BRC-91, "Description".

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS (1)

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1143” detected?

YES-1 >> “CRNT” is displayed: GO TO 3.
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO >> INSPECTION END

3. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 4.

4. PERFORM SELF-DIAGNOSIS (2)

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1143” detected?

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

5. CHECK STEERING ANGLE SENSOR POWER SUPPLY

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

+		–	Voltage
Steering angle sensor			
Connector	Terminal		
M77	4	Ground	Approx. 0 V

4. Turn the ignition switch ON.
   NOTE:

Start the engine.

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

+		–	Voltage
Steering angle sensor			
Connector	Terminal		
M77	4	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 8.
NO (For VR30DDTT engine models)>>GO TO 6.
NO (For 2.0L TURBO engine models)>>GO TO 7.

6. CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT (FOR VR30DDTT ENGINE MODELS)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#54).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between steering angle sensor harness connector and IPDM E/R harness connector.

Steering angle sensor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
M77	4	E121	35	Existed

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M77	4	Ground	Not existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.
NO >> Repair / replace harness, connector, or fuse.

7. CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT (FOR 2.0L TURBO ENGINE MODELS)

1. Turn the ignition switch OFF.
2. Check the 10 A fuse (#75).
3. Check the continuity and short circuit between steering angle sensor harness connector terminal (4) and 10A fuse (#75).

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.
NO >> Repair or replace error-detected parts.

8. CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M77	1	Ground	Existed

Is the inspection result normal?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair / replace harness, connector, fuse, or fusible link.

10. CHECK TERMINAL

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

Is the inspection result normal?

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

11. CHECK CAN COMMUNICATION LINE

1. Connect steering angle sensor harness connector.
2. Connect IPDM E/R harness connector.
3. Check the CAN communication line. Refer to LAN-41, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair / replace harness or connector. Refer to LAN-31, "Precautions for Harness Repair".

12. CHECK DATA MONITOR

With CONSULT
1. “ABS”, “DATA MONITOR” and “STR ANGLE SIG” according to this order.
2. Check that the indication changes with the steering angle when the steering wheel is turned left/right from the neutral position. Refer to BRC-66, "Reference Value".

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Replace the steering angle sensor. Refer to BRC-197, "Removal and Installation".

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Description

INFOID:0000000012793775

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
Incomplete neutral position adjustment of steering angle sensor	• Harness or connector • Steering angle sensor • ABS actuator and electric unit (control unit) • Incomplete neutral position adjustment of steering angle sensor

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- Brake limited slip differential (BLSD) function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1144” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-145, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793776

1.ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to BRC-91, "Description".

>> GO TO 2.

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

With CONSULT

1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1144” detected?

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

3.CHECK STEERING ANGLE SENSOR SYSTEM

1. Turn the ignition switch OFF.
2. Check the steering angle sensor system. Refer to BRC-142, "Diagnosis Procedure".

Is the inspection result normal?

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

4.CHECK DATA MONITOR

With CONSULT

1. “ABS”, “DATA MONITOR” and “STR ANGLE SIG” according to this order.
2. Check that the indication changes with the steering angle when the steering wheel is turned left/right from the neutral position. Refer to BRC-66, "Reference Value".

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Replace the steering angle sensor. Refer to BRC-197, "Removal and Installation".

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

DTC Description

INFOID:0000000012793777

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

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

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

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- ABS function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1145” or “C1146” detected?

YES-1 >> “C1145” or “C1146” is displayed by “CRNT”: Proceed to BRC-148, "Diagnosis Procedure".
YES-2 >> “C1145” and “C1146” are displayed by “PAST”: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793778

1. CHECK SELF-DIAGNOSIS RESULTS

With CONSULT

Replace the ABS actuator and electric unit (control unit) even if other DTCs are displayed along with “C1145” or “C1146” in self-diagnosis for “ABS”.

>> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

C1155 BRAKE FLUID LEVEL SWITCH

DTC Description

INFOID:0000000012793779

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1155	BR FLUID LEVEL LOW (Brake fluid level low)	• When brake fluid level low signal is detected. • When an open circuit is detected in brake fluid level switch circuit.

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • Brake fluid level is low	• Harness or connector • ABS actuator and electric unit (control unit) • Brake fluid level switch • Combination meter • Brake fluid level is low

FAIL-SAFE

- VDC function
- TCS function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1155” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-149, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793780

1.CHECK BRAKE FLUID LEVEL

1. Turn the ignition switch OFF.

2. Check the brake fluid level. Refer to BR-16, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Refill brake fluid. Refer to BR-16, "Refilling". GO TO 2.

2.PERFORM SELF-DIAGNOSIS (1)

With CONSULT
1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1155” detected?

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

3.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check the brake fluid level switch harness connector for disconnection or looseness.
3. Check the combination meter harness connector for disconnection or looseness.

Is the inspection result normal?

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

4.PERFORM SELF-DIAGNOSIS (2)

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1155” detected?

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

5.CHECK BRAKE FLUID LEVEL SWITCH

Check the brake fluids level switch. Refer to BRC-152, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace the reservoir tank. Refer to BR-44, "Disassembly and Assembly". GO TO 6.

6.PERFORM SELF-DIAGNOSIS (3)

With CONSULT
1. Erase self-diagnosis result for “ABS”.
2. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
4. Perform self-diagnosis for “ABS”.

Is DTC “C1155” detected?

YES >> GO TO 7.

NO >> INSPECTION END

7.CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair / replace harness, connector, or terminal, and GO TO 8.

8.PERFORM SELF-DIAGNOSIS (4)

With CONSULT

1. Connect brake fluid level switch harness connector.
2. Connect combination meter harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1155” detected?

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

9.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

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

Brake fluid level switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
E4	1	M57	25	Existed

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

Brake fluid level switch		—	Continuity
Connector	Terminal		
E4	1	Ground	Not existed

Is the inspection result normal?

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

10.CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

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

Brake fluid level switch		—	Continuity
Connector	Terminal		
E4	2	Ground	Existed

Is the inspection result normal?

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

11. CHECK COMBINATION METER

1. Connect brake fluid level switch harness connector.
2. Connect combination meter harness connector.
3. Check the combination meter. Refer to MWI-68, "On Board Diagnosis Function".

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-141, "Removal and Installation".

Component Inspection

INFOID:0000000012793781

1. CHECK BRAKE FLUID LEVEL SWITCH

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the reservoir tank. Refer to BR-44, "Disassembly and Assembly".

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

DTC Description

INFOID:0000000012793782

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1160	DECEL G SEN SET (Decel G sensor set)	When calibration of yaw rate/side/decel G sensor is not complete.

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• Incomplete calibration of decel G sensor • ABS actuator and electric unit (control unit)

FAIL-SAFE

- VDC function
- TCS function
- ABS function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1160” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-154, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793783

1. CALIBRATION OF DECEL G SENSOR

Perform calibration of decel G sensor. Refer to BRC-94, "Description".

>> GO TO 2.

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

With CONSULT

1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1160” detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

NO >> INSPECTION END

C1164, C1165 CV SYSTEM

DTC Description

INFOID:0000000012793784

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1164	CV 1 (Cut valve 1)	When a malfunction is detected in cut valve 1.
C1165	CV 2 (Cut valve 2)	When a malfunction is detected in cut valve 2.

POSSIBLE CAUSE

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

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

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- ABS function
- EBD function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1164” or “C1165” detected?

YES-1 >> “C1164” or “C1165” is displayed by “CRNT”: Proceed to BRC-156, "Diagnosis Procedure".

YES-2 >> “C1164” and “C1165” are displayed by “PAST”: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793785

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “ABS” again.

Is DTC “C1164” or “C1165” detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair / replace harness, connector, or terminal.

C1170 VARIANT CODING

DTC Description

INFOID:0000000012793786

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1170	VARIANT CODING (Variant coding)	When the information in ABS actuator and electric unit (control unit) is not the same.

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
—	• ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) is not configured.

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- ABS function
- Brake limited slip differential (BLSD) function
- Brake assist function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1170” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-157, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793787

1.CONFIGURATION OF ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform configuration of ABS actuator and electric unit (control unit). Refer to BRC-96, "Work Procedure".
CAUTION:

Never replace the ABS actuator and electric unit (control unit).

>> GO TO 2.

2.CHECK SELF-DIAGNOSIS RESULTS

With CONSULT

Replace the ABS actuator and electric unit (control unit) even if other DTC are displayed along with “C1170” in self-diagnosis for “ABS”.

>> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

C1197 VACUUM SENSOR

DTC Description

INFOID:0000000012793788

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1197	VACUUM SENSOR (Vacuum sensor)	When a malfunction is detected in vacuum sensor.

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• Harness or connector • Vacuum sensor (brake booster) • Vacuum piping • ABS actuator and electric unit (control unit)

FAIL-SAFE

Electrical vacuum assistance of brake booster is suspended.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1197” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-159, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793789

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair / replace harness or connector, and GO TO 2.

2.CHECK BRAKE BOOSTER

1. Turn the ignition switch OFF.
2. Check the brake booster. Refer to BR-19, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the brake booster. Refer to BR-46, "Removal and Installation".

3.CHECK VACUUM PIPING

Check the vacuum piping. Refer to BR-50, "2.0L TURBO GASOLINE ENGINE : Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace the vacuum piping. Refer to BR-49, "2.0L TURBO GASOLINE ENGINE : Removal and Installation".

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair / replace harness, connector, or terminal.

5.CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E62	1	E35	13	Existed
	2		32	
	3		28	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E62	1	Ground	Not existed
	2		
	3		

Is the inspection result normal?

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

6.REPLACE VACUUM SENSOR

With CONSULT
1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to BR-46, "Removal and Installation".

3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1197” detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

NO >> INSPECTION END

C1198 VACUUM SENSOR

DTC Description

INFOID:0000000012793790

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1198	VACUUM SEN CIR (Vacuum sensor circuit)	• When an open circuit is detected in vacuum sensor circuit. • When a short circuit is detected in vacuum sensor circuit. • When a malfunction is detected in vacuum sensor noise.

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• Harness or connector • Vacuum sensor (brake booster) • ABS actuator and electric unit (control unit)

FAIL-SAFE

Electrical vacuum assistance of brake booster is suspended.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1198” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-162, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793791

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 2.

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

2.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness, connector, or terminal.

3.CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E62	1	E35	13	Existed
	2		32	
	3		28	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E62	1	Ground	Not existed
	2		
	3		

Is the inspection result normal?

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

4.REPLACE VACUUM SENSOR

With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.
   CAUTION:
   Always replace brake booster because vacuum sensor cannot be disassembled. Refer to BR-46, "Removal and Installation".
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1198” detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> INSPECTION END

C1199 BRAKE BOOSTER

DTC Description

INFOID:0000000012793792

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1199	BRAKE BOOSTER (Brake booster)	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• Harness or connector • Vacuum sensor (brake booster) • Vacuum piping • ABS actuator and electric unit (control unit)

FAIL-SAFE

None

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C1199” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-164, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793793

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair / replace harness or connector, and GO TO 2.

2.CHECK BRAKE BOOSTER

1. Turn the ignition switch OFF.
2. Check the brake booster. Refer to BR-19, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the brake booster. Refer to BR-46, "Removal and Installation".

3.CHECK VACUUM PIPING

Check the vacuum piping. Refer to BR-50, "2.0L TURBO GASOLINE ENGINE : Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace the vacuum piping. Refer to BR-49, "2.0L TURBO GASOLINE ENGINE : Removal and Installation".

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair / replace harness, connector, or terminal.

5.CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E62	1	E35	13	Existed
	2		32	
	3		28	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E62	1	Ground	Not existed
	2		
	3		

Is the inspection result normal?

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

6.REPLACE VACUUM SENSOR

With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to BR-46, "Removal and Installation".

3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF → ON → OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
6. Perform self-diagnosis for “ABS”.

Is DTC “C1199” detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

NO >> INSPECTION END

C119A VACUUM SENSOR

DTC Description

INFOID:0000000012793794

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C119A	VACUUM SEN VOLT (Vacuum sensor voltage)	When a malfunction is detected in supply power voltage of vacuum sensor.

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery	• Harness or connector • Vacuum sensor (brake booster) • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

FAIL-SAFE

Electrical vacuum assistance of brake booster is suspended.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “C119A” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-167, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793795

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair / replace harness or connector, and GO TO 2.

2.CHECK VACUUM SENSOR POWER SUPPLY

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

+		–	Voltage
Vacuum sensor			
Connector	Terminal		
E62	3	Ground	Approx. 0 V

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

+		–	Voltage
Vacuum sensor			
Connector	Terminal		
E62	3	Ground	4.75 – 5.25 V

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK VACUUM SENSOR POWER SUPPLY CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E62	3	E35	28	Existed

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

Vacuum sensor		—	Continuity
Connector	Terminal		
E62	3	Ground	Not existed

Is the inspection result normal?

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

4.CHECK VACUUM SENSOR GROUND CIRCUIT

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

Vacuum sensor		—	Continuity
Connector	Terminal		
E62	2	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness or connector.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

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

6. CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair / replace harness, connector, or terminal.

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:0000000012793796

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
U1000	CAN COMM CIRCUIT (CAN communication circuit)	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.

POSSIBLE CAUSE

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

PAST DTC	CRNT DTC
• Harness or connector • CAN communication line	CAN communication system malfunction

FAIL-SAFE

The following functions are suspended.
- VDC function
- TCS function
- Brake limited slip differential (BLSD) function
- hill start assist function
- Brake force distribution function
- Active trace control function (control of chassis control module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the ignition switch OFF.
   NOTE:
   Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
   NOTE:
   Wait at least 10 seconds after start the engine.
3. Perform self-diagnosis for “ABS”.

Is DTC “U1000” detected?

YES-1 >> “CRNT” is displayed: Proceed to BRC-170, "Diagnosis Procedure".
YES-2 >> “PAST” is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)
NO-1 >> To check malfunction symptom before repair: Refer to GI-45, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012793797

Proceed to LAN-41, "Trouble Diagnosis Flow Chart".

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000012793798

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

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

+		–	Voltage
ABS actuator and electric unit (control unit)			
Connector	Terminal		
E35	34	Ground	Approx. 0 V

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

+		–	Voltage
ABS actuator and electric unit (control unit)			
Connector	Terminal		
E35	34	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 4.
NO (For VR30DDTT engine models)>>GO TO 2.
NO (For 2.0L TURBO engine models)>>GO TO 3.

2. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY CIRCUIT (FOR VR30DDTT ENGINE MODELS)

1. Turn the ignition switch OFF.
2. Check the 10A (#54)
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R harness connector.

ABS actuator and electric unit (control unit)		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E35	34	B121	35	Existed

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	34	Ground	No existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.
NO >> Repair / replace harness, connector, or fuse.

3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY CIRCUIT (EXCEPT FOR 2.0L TURBO ENGINE MODELS)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#75).

3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (34) and 10A fuse (#75).

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.
NO >> Repair or replace error-detected parts.

4.CHECK MOTOR AND MOTOR RELAY POWER SUPPLY

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

+		–	Voltage
ABS actuator and electric unit (control unit)			
Connector	Terminal		
B35	4	Ground	10 – 16 V

Is the inspection result normal?

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

5.CHECK MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply.
NO >> Repair / replace harness, connector, or fusible link.

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

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

+		–	Voltage
ABS actuator and electric unit (control unit)			
Connector	Terminal		
E35	3	Ground	10 – 16 V

Is the inspection result normal?

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

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

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

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply.
NO >> Repair / replace harness, connector, or fusible link.

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

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	1	Ground	Existed
	2		

Is the inspection result normal?

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

9.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair / replace harness, connector, or terminal.

PARKING BRAKE SWITCH

Component Function Check

INFOID:0000000012793799

1.CHECK PARKING BRAKE SWITCH OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to BRC-174, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012793800

1.CHECK PARKING BRAKE SWITCH CIRCUIT

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

Parking brake switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
E60	1	M57	26	Existed

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

Parking brake switch		—	Continuity
Connector	Terminal		
E60	1	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair / replace harness, connector, or terminal.

2.CHECK PARKING BRAKE SWITCH

Check the parking brake switch. Refer to BRC-175, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the parking brake switch. Refer to PB-9, "Removal and Installation".

3.CHECK PARKING BRAKE SWITCH SIGNAL

With CONSULT

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 4.

4.CHECK COMBINATION METER

Check the combination meter. Refer to MWI-70, "CONSULT Function".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace combination meter. Refer to MWI-141, "Removal and Installation".

5. CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair / replace harness, connector, or terminal.

Component Inspection

INFOID:0000000012793801

1. CHECK PARKING BRAKE SWITCH

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the parking brake switch. Refer to PB-9, "Removal and Installation".

VDC OFF SWITCH

Component Function Check

INFOID:0000000012793802

1.CHECK VDC OFF SWITCH OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to BRC-176, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012793803

1.CHECK VDC OFF SWITCH CIRCUIT

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

ABS actuator and electric unit (control unit)		Triple switch		Continuity
Connector	Terminal	Connector	Terminal	
E35	30	M80	3	Existed

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E35	30	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair / replace harness, connector, or terminal.

2.CHECK VDC OFF SWITCH GROUND CIRCUIT

Check the continuity between triple switch harness connector and ground.

Triple switch		—	Continuity
Connector	Terminal		
M80	5	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace harness, connector, or terminal.

3.CHECK VDC OFF SWITCH

Check the VDC OFF switch. Refer to BRC-177, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace the VDC OFF switch. Refer to BRC-198, "Removal and Installation".

4.CHECK VDC OFF SWITCH SIGNAL

With CONSULT

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

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

Is the inspection result normal?

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

5. CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".
NO >> Repair / replace harness, connector, or terminal.

Component Inspection

INFOID:0000000012793804

1. CHECK VDC OFF SWITCH

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the VDC OFF switch. Refer to BRC-198, "Removal and Installation".

ABS WARNING LAMP

Component Function Check

INFOID:0000000012793805

1.CHECK ABS WARNING LAMP FUNCTION

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

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to BRC-178, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012793806

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

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair / replace harness, connector, fuse, or fusible link.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF → ON.
   CAUTION:
   - **Be sure to wait of 10 seconds after turning ignition switch OFF or ON.**
   - **Start the engine.**
2. Repeat step 1 two or more times.
3. Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-72, "DTC Index".
NO >> GO TO 3.

3.CHECK ABS WARNING LAMP SIGNAL

With CONSULT

1. Select “ABS”, “DATA MONITOR” and “ABS WARN LAMP” according to this order.
2. Turn the ignition switch OFF.
3. Check that data monitor displays “On” for 1 second after ignition switch is turned ON and then changes to “Off”.
   CAUTION:
   Never start the engine.

Is the inspection result normal?

YES >> Replace the combination meter. Refer to MWI-141, "Removal and Installation".
NO >> Replace the ABS actuator and electric unit (control unit). Refer to MWI-141, "Removal and Installation".

BRAKE WARNING LAMP

Component Function Check

INFOID:0000000012793807

1.CHECK BRAKE WARNING LAMP FUNCTION (1)

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

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to BRC-179, "Diagnosis Procedure".

2.CHECK BRAKE WARNING LAMP FUNCTION (2)

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

NOTE:

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check the parking brake switch system. Refer to BRC-174, "Diagnosis Procedure".

3.CHECK BRAKE WARNING LAMP FUNCTION (3)

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

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the brake fluid level switch system. Refer to BRC-149, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012793808

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

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

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

2.PERFORM THE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF → ON.

   CAUTION:

   - **Be sure to wait of 10 seconds after turning ignition switch OFF or ON.**
   - **Start the engine.**

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-72, "DTC Index".

NO >> GO TO 3.

3.CHECK BRAKE WARNING LAMP SIGNAL

With CONSULT

1. Select “ABS”, “DATA MONITOR” and “EBD WARN LAMP” according to this order.
2. Turn the ignition switch OFF.

3. Check that data monitor displays “On” for 1 second after ignition switch is turned ON and then changes to “Off”.
   CAUTION:
   Never start the engine.

Is the inspection result normal?

YES >> Replace the combination meter. Refer to MWI-141, "Removal and Installation".
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

VDC WARNING LAMP

Component Function Check

INFOID:0000000012793809

1.CHECK VDC WARNING LAMP FUNCTION

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

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to BRC-181, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012793810

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

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

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

2.PERFORM THE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF → ON.

   CAUTION:

   - **Be sure to wait of 10 seconds after turning ignition switch OFF or ON.**
   - **Start the engine.**

2. Repeat step 1 two or more times.
3. Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-72, "DTC Index".

NO >> GO TO 3.

3.CHECK VDC WARNING LAMP SIGNAL

With CONSULT

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

   CAUTION:

   Never start the engine.

Is the inspection result normal?

YES >> Replace the combination meter. Refer to MWI-141, "Removal and Installation".

NO >> Replace the ABS actuator and electric unit (control unit). Refer to MWI-141, "Removal and Installation".

VDC OFF INDICATOR LAMP

Component Function Check

INFOID:0000000012793811

1.CHECK VDC OFF INDICATOR LAMP FUNCTION (1)

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

CAUTION:

Never start the engine.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Proceed to BRC-182, "Diagnosis Procedure".

2.CHECK VDC OFF INDICATOR LAMP FUNCTION (2)

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check the VDC OFF switch system. Refer to BRC-176, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012793812

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

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-171, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair / replace harness, connector, fuse, or fusible link.

2.CHECK VDC OFF INDICATOR LAMP SIGNAL (1)

With CONSULT

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

   CAUTION:

   Never start the engine.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

3.CHECK VDC OFF INDICATOR LAMP SIGNAL (2)

With CONSULT

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

Is the inspection result normal?

YES >> Replace the combination meter. Refer to MWI-141, "Removal and Installation".
NO >> Check the VDC OFF switch system. Refer to BRC-176, "Diagnosis Procedure".

SYMPTOM DIAGNOSIS

EXCESSIVE OPERATION FREQUENCY

Description

INFOID:0000000012793813

VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function or Brake force distribution function operates in excessive operation frequency.

Diagnosis Procedure

INFOID:0000000012793814

1. CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

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

2. CHECK FRONT AND REAR AXLE

Check that there is no excessive looseness in front and rear axle.
- Front axle
  - 2WD: Refer to FAX-7, "Inspection".
  - AWD: Refer to FAX-17, "Inspection".
- Rear axle: Refer to RAX-6, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair / replace error-detecting of front or rear axle part.

3. CHECK WHEEL SENSOR

Check wheel sensor.
- Check installation and damage of wheel sensor.
- Check connection of wheel sensor harness connector.
- Check terminal of wheel sensor harness connector.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair installation or replace wheel sensor.
- Front wheel sensor: Refer to BRC-191, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear wheel sensor: Refer to BRC-192, "REAR WHEEL SENSOR : Removal and Installation".

4. CHECK SENSOR ROTOR

Check that there is no looseness, damage or foreign material on sensor rotor.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair installation or replace sensor rotor.
- Front sensor rotor: Refer to BRC-194, "FRONT SENSOR ROTOR : Removal and Installation".
- Rear sensor rotor: Refer to BRC-194, "REAR SENSOR ROTOR : Removal and Installation".

5. CHECK WARNING LAMP TURNS OFF

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

CAUTION:

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

Is the inspection result normal?

YES >> Normal
NO >> GO TO 6.

6. PERFORM THE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF → ON.
   CAUTION:
   - **Be sure to wait of 10 seconds after turning ignition switch OFF or ON.**
   - **Start the engine.**
2. Repeat step 1 two or more times.
3. Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-72, "DTC Index".
NO >> INSPECTION END

UNEXPECTED BRAKE PEDAL REACTION

Description

INFOID:0000000012793815

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

Diagnosis Procedure

INFOID:0000000012793816

1.CHECK FRONT AND REAR AXLE

Check that there is no excessive looseness in front and rear axle.
- Front axle
  - 2WD: Refer to FAX-7, "Inspection".
  - AWD: Refer to FAX-17, "Inspection".
- Rear axle: Refer to RAX-6, "Inspection".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair / replace error-detecting of front or rear axle part.

2.CHECK DISC ROTOR

Check disc rotor runout.
- Front: Refer to BR-20, "DISC ROTOR : Inspection and Adjustment".
- Rear: Refer to BR-22, "DISC ROTOR : Inspection and Adjustment".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Refinish the disc rotor.

3.CHECK BRAKE FLUID LEAKAGE

Check fluid leakage.
- Front: Refer to BR-34, "FRONT : Inspection".
- Rear Refer to BR-41, "REAR : Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair / replace fluid leakage part.

4.CHECK BRAKE PEDAL

Check each item of brake pedal. Refer to BR-12, "Inspection and Adjustment".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Adjust each item of brake pedal. Refer to BR-12, "Inspection and Adjustment".

5.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 6.
NO >> Check each components of brake system.

6.CHECK BRAKE PERFORMANCE

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

Is the inspection result normal?

YES >> Normal
NO >> Check each components of brake system.

THE BRAKING DISTANCE IS LONG

Description

INFOID:0000000012793817

Brake stopping distance is long when ABS function is operated.

Diagnosis Procedure

INFOID:0000000012793818

CAUTION:

Brake stopping distance on slippery road like rough road, gravel road or snowy road may become longer when ABS is operated than when ABS is not operated.

1.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check each components of brake system.

2.CHECK BRAKE PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector so that ABS does not operate. Check brake stopping distance in this condition. Connect harness connectors after checking.

Is the inspection result normal?

YES >> Normal
NO >> Check each components of brake system.

DOES NOT OPERATE

Description

INFOID:0000000012793819

VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function or Brake force distribution function does not operate.

Diagnosis Procedure

INFOID:0000000012793820

CAUTION:

- **VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function never operate when the vehicle speed is 10 km/h (6.2 MPH) or less. However, TCS function, Brake limited slip differential (BLSD) function and hill start assist function operates when the vehicle speed is 0 km/h (0 MPH) (the vehicle is in stop status).**
- **VDC function and TCS function never operate when VDC OFF switch is operated (when VDC OFF indicator lamp turns ON).**

1. CHECK ABS WARNING LAMP

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

CAUTION:

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

Is the inspection result normal?

YES >> Normal
NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF → ON.
   CAUTION:
   - **Be sure to wait of 10 seconds after turning ignition switch OFF or ON.**
   - **Start the engine.**
2. Repeat step 1 two or more times.
3. Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-72, "DTC Index".
NO >> INSPECTION END

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

Description

INFOID:0000000012793821

- Brake pedal vibrates and motor sound from ABS actuator and electric unit (control unit) occurs, when the engine starts.
- Brake pedal vibrates during braking.

CAUTION:

Vibration may be felt during brake pedal is lightly depressed (just placing a foot on it) in the following conditions. This is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves [Approx. 50 mm (1.97 in) or more]**
- **When pulling away just after starting engine [at approx. 10 km/h (6.2 MPH) or higher]**

Diagnosis Procedure

INFOID:0000000012793822

1.SYMPTOM CHECK 1

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

Do vibrations occur?

YES >> GO TO 2.
NO >> Check brake pedal. Refer to BR-25, "Inspection and Adjustment".

2.SYMPTOM CHECK 2

Check that motor sound from ABS actuator occurs when the engine starts.

Does the operation sound occur?

YES >> GO TO 3.
NO >> Perform self-diagnosis for “ABS” with CONSULT.

3.SYMPTOM CHECK 3

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

Does the symptom occur?

YES >> Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit).
NO >> GO TO 4.

4.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF → ON.
   CAUTION:
   - **Be sure to wait of 10 seconds after turning ignition switch OFF or ON.**
   - **Start the engine.**
2. Repeat step 1 two or more times.
3. Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-72, "DTC Index".
NO >> INSPECTION END

VEHICLE JERKS DURING

Description

INFOID:0000000012793823

The vehicle jerks when VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function or Brake force distribution function operates.

Diagnosis Procedure

INFOID:0000000012793824

1.CHECK SYMPTOM

Check that the vehicle jerks when VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function or Brake force distribution function operates.

Is the inspection result normal?

YES >> Normal
NO >> GO TO 2.

2.PERFORM THE SELF-DIAGNOSIS

With CONSULT
1. Turn the ignition switch OFF → ON.
   CAUTION:
   - **Be sure to wait of 10 seconds after turning ignition switch OFF or ON.**
   - **Start the engine.**
2. Repeat step 1 two or more times.
3. Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-72, "DTC Index".
NO >> GO TO 3.

3.CHECK CONNECTOR

With CONSULT
1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check connector terminal for deformation, disconnection and looseness.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Poor connection of connector terminal. Repair or replace connector terminal.

4.PERFORM THE SELF-DIAGNOSIS

With CONSULT
1. Connect harness connector.
2. Turn the ignition switch OFF → ON.
   CAUTION:
   - **Be sure to wait of 10 seconds after turning ignition switch OFF or ON.**
   - **Start the engine.**
3. Repeat step 2 two or more times.
4. Perform self-diagnosis for “ABS”.

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-72, "DTC Index".
NO >> GO TO 5.

5.PERFORM THE SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “ENGINE”, “TRANSMISSION”.

Is any DTC detected?

YES >> Check the DTC.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-195, "Removal and Installation".

NORMAL OPERATING CONDITION

Description

INFOID:0000000012793825

Symptom	Result
Brake pedal slightly vibrates and operation sound (motor sound and sound from suspension) occurs when VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function or Brake force distribution function operates.	This is not a malfunction, because it is caused by VDC function, TCS function, ABS function, EBD function, Brake limited slip differential (BLSD) function, Brake assist function, hill start assist function and Brake force distribution function that are normally operated.
Brake stopping distance may become longer than models without ABS function depending on the road conditions, when ABS function is operated on slippery road like rough road, gravel road or snowy road.	
Brake pedal vibrates and operation sound occurs during sudden acceleration and cornering, when VDC function, TCS function, Brake assist function or Brake force distribution function is operated.	
Brake pedal vibrates and motor sound from the engine room occurs, when the engine starts or the vehicle starts just after starting the engine.	This is not a malfunction, because it is caused by operation check of ABS actuator and electric unit (control unit).
Acceleration may be felt insufficient depending on the road conditions.	This is not a malfunction, because it is caused by TCS function that puts the highest priority to obtain the optimum traction (stability).
TCS function may operate momentarily, while driving on a road where friction coefficient varies, or when downshifting, or fully depressing accelerator pedal.	
ABS warning lamp and VDC OFF indicator lamp may turn ON, when the vehicle is on a rotating turntable or is given a strong shaking or large vibrations on a ship while the engine is running.	In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. In that case, erase “ABS” self-diagnosis result memory with CONSULT.
VDC warning lamp may turn ON and VDC function, TCS function, Brake assist function, and Brake force distribution function may not normally operate, when driving on a special road the is extremely slanted (bank in a circuit course).	
A malfunction in yaw rate/side/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function, TCS function, are OFF (VDC OFF switch is pressed and VDC OFF indicator lamp is in ON status).	
The vehicle speed does not increase, when the accelerator pedal is depressed while the vehicle is on a 2-wheel chassis dynamometer for speedometer check.	This is normal. (When checking the vehicle on a chassis dynamometer, operate VDC OFF switch so that TCS function is OFF.)

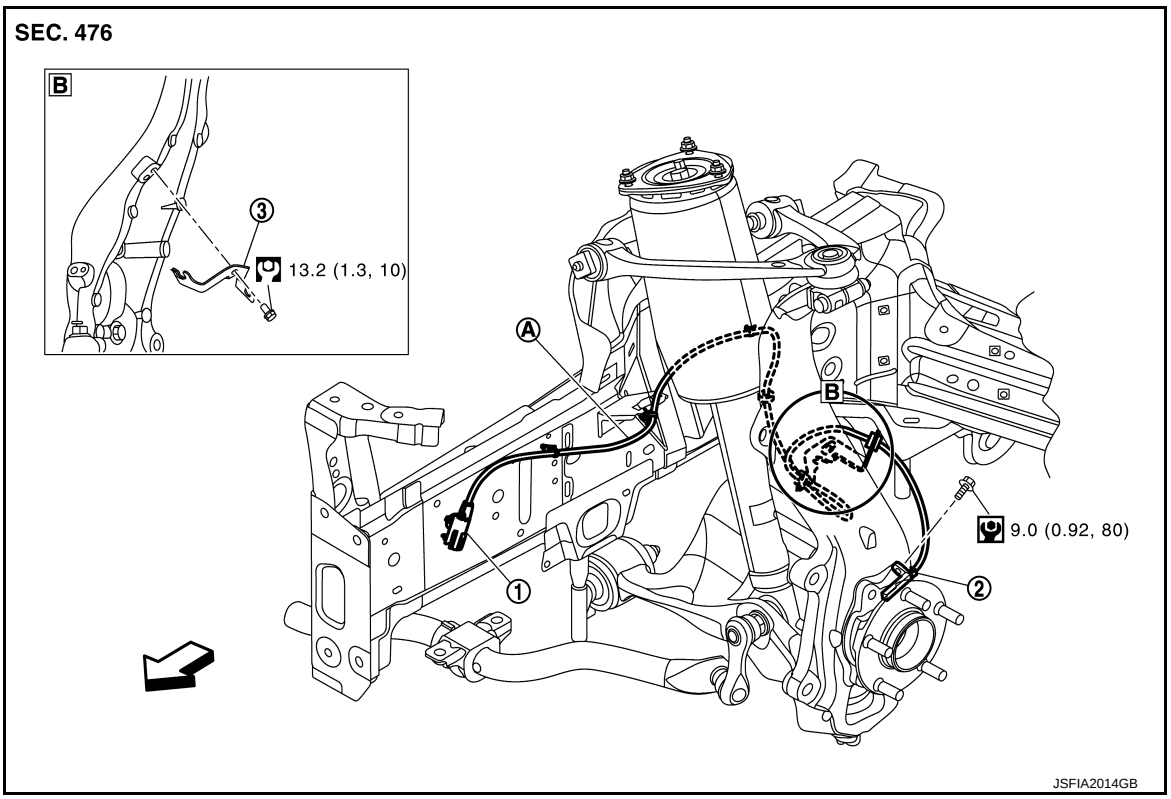
REMOVAL AND INSTALLATION

WHEEL SENSOR

FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:0000000012793826



① Front LH wheel sensor harness connector ② Front LH wheel sensor ③ Bracket

Ⓐ Identification line

⇦: Vehicle front

: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

NOTE:
Front RH wheel sensor is symmetrically opposite of LH.

FRONT WHEEL SENSOR : Removal and Installation

INFOID:0000000012793827

REMOVAL

1. Remove tires with power tool.
2. Remove the fender protector (front). Refer to EXT-30, "FENDER PROTECTOR : Removal and Installation".
3. Remove front wheel sensor from steering knuckle.
   CAUTION:
   Never rotate and never pull front wheel sensor as much as possible, when pulling out.
4. Remove front wheel sensor harness from the vehicle.
   CAUTION:
   Never twist or pull front wheel sensor harness, when removing.

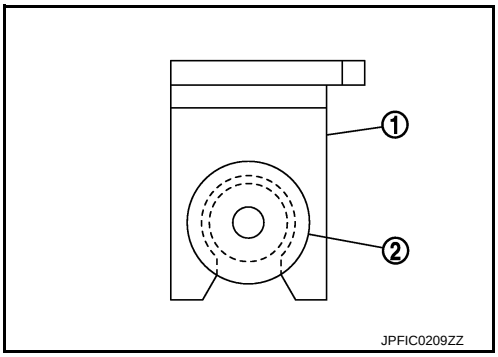
INSTALLATION

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

- Check that there is no foreign material like iron powder or damage on inner surface of front wheel sensor mounting hole of steering knuckle and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.
- Never twist front wheel sensor harness when installing front wheel sensor. Check that grommet ② is fully inserted to bracket ①. Check that front wheel sensor harness is not twisted after installation.

CAUTION:

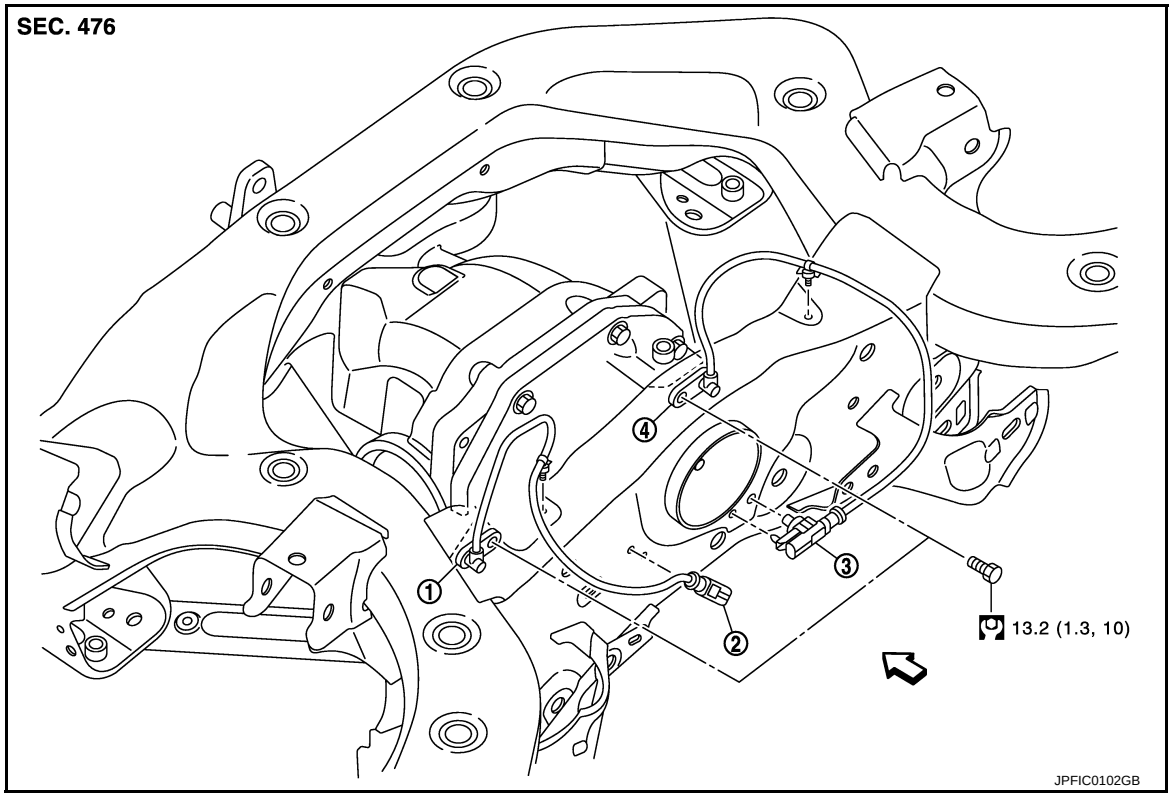
Check that front wheel sensor identification line faces toward the vehicle front.



REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:0000000012793828



① Rear LH wheel sensor
② Rear LH wheel sensor harness connector
③ Rear RH wheel sensor harness connector
④ Rear RH wheel sensor

⇦: Vehicle front

: N·m (kg-m, ft-lb)

REAR WHEEL SENSOR : Removal and Installation

INFOID:0000000012793829

REMOVAL

1. Remove rear wheel sensor from rear final drive.

CAUTION:
Never rotate or pull rear wheel sensor as much as possible, when pulling out.

2. Remove rear wheel sensor harness from the vehicle.

CAUTION:
Never twist and never pull rear wheel sensor harness, when removing.

INSTALLATION

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

- Check that there is no foreign material like iron powder or damage on inner surface of rear wheel sensor mounting hole of rear final drive and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.
- Never twist rear wheel sensor harness when installing rear wheel sensor. Check that grommet is fully inserted to bracket. Check that rear wheel sensor harness is not twisted after installation.

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Removal and Installation

INFOID:0000000012793830

REMOVAL

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled.

- 2WD: Refer to FAX-8, "Removal and Installation".
- AWD: Refer to FAX-19, "Removal and Installation".

INSTALLATION

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled.

- 2WD: Refer to FAX-19, "Removal and Installation".
- AWD: Refer to FAX-19, "Removal and Installation".

REAR SENSOR ROTOR

REAR SENSOR ROTOR : Removal and Installation

INFOID:0000000012793831

REMOVAL

1. Remove drive shaft. Refer to RAX-13, "Removal and Installation".
2. Remove sensor rotor from rear drive shaft. Refer to RAX-18, "FINAL DRIVE SIDE : Disassembly and Assembly".

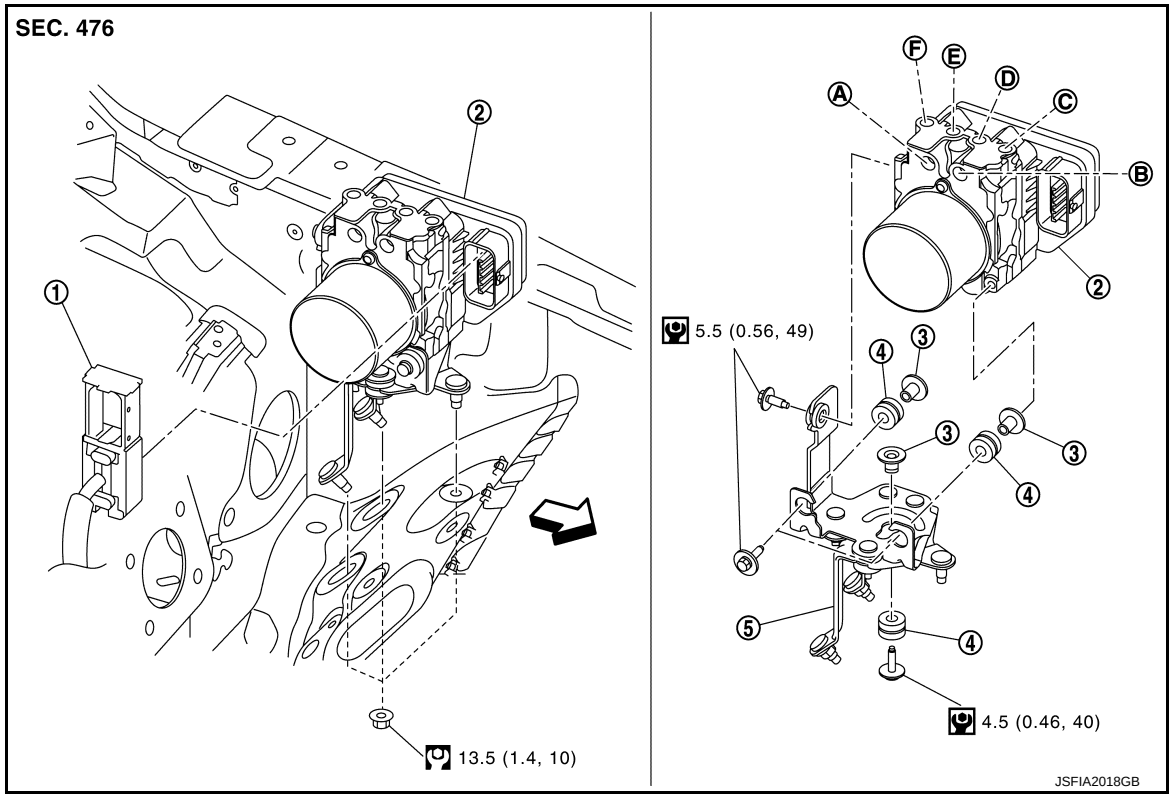
INSTALLATION

Installation is the reverse order of removal.

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:0000000012793832



① ABS actuator and electric unit (control unit) harness connector	② ABS actuator and electric unit (control unit)	③ Collar
④ Bushing	⑤ Bracket	
Ⓐ To master cylinder secondary side	Ⓑ To master cylinder primary side	Ⓒ To front LH caliper
Ⓓ To rear RH caliper	Ⓔ To rear LH caliper	Ⓕ To front RH caliper

⇦: Vehicle front

: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

Removal and Installation

INFOID:0000000012793833

REMOVAL

CAUTION:

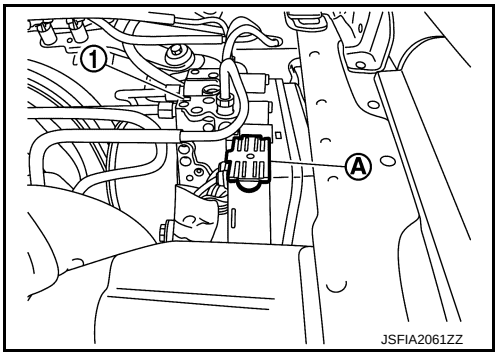
Never drop or strike ABS actuator and electric unit (control unit), because it has little endurance to impact. Never use a pneumatic tool.

1. Turn the ignition switch OFF.
2. Disconnect battery cable from negative terminal.
3. Remove brake master cylinder cover. Refer to EXT-27, "Removal and Installation".
4. Drain brake fluid. Refer to BR-16, "Draining".

5. Disconnect ABS actuator and electric unit (control unit) harness connector ①, follow the procedure below.

a. Pull up the lever Ⓐ until locked.

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



6. Loosen flare nut ① of brake tube ③ using a flare nut wrench, and then remove brake tube from ABS actuator and electric unit (control unit) ②. Refer to BR-26, "FRONT : Exploded View".

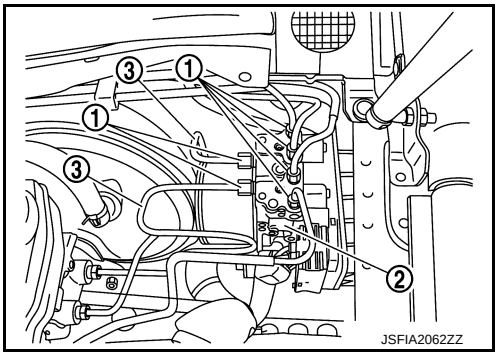
7. Remove front tire with power tool.

8. Remove fender protector (rear). Refer to EXT-30, "FENDER PROTECTOR : Removal and Installation".

9. Remove ABS actuator and electric unit (control unit) and bracket.

CAUTION:

- **Never remove and never install ABS actuator and electric unit (control unit) by holding harness connector.**
- **Be careful not to drop ABS actuator and electric unit (control unit) and apply excessive impact to it.**



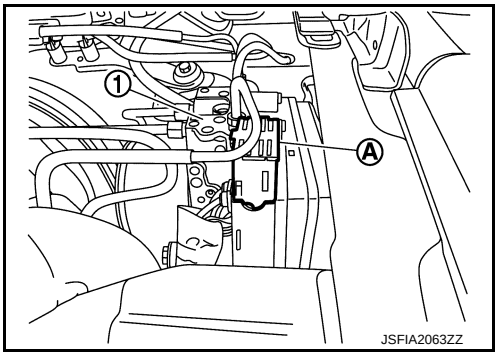
10. Remove bracket, bushing and collar from ABS actuator and electric unit (control unit).

INSTALLATION

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

- Never drop or strike ABS actuator and electric unit (control unit), because it has little endurance to impact. Never use a pneumatic tool.
- 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-26, "FRONT : Exploded View".
- Never remove and install actuator by holding actuator harness.
- Bleed air from brake piping after installation. Refer to BR-17, "Bleeding Brake System".
- Never apply excessive impact to actuator, such as by dropping it.
- After installing the ABS actuator and electric unit (control unit) harness connector ①, push down the lever Ⓐ until locked.
- When replacing the ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Configuration: Refer to BRC-96, "Work Procedure".
- Adjustment of steering angle sensor: Refer to BRC-91, "Work Procedure".
- Calibration of decel G sensor: Refer to BRC-94, "Work Procedure".



STEERING ANGLE SENSOR

Removal and Installation

INFOID:0000000012793834

REMOVAL

1. Remove spiral cable assembly. Refer to SR-22, "Removal and Installation".
2. Remove steering angle sensor.

INSTALLATION

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

- Perform steering angle sensor neutral position adjustment when steering angle sensor is removed and installed, or replaced. Refer to BRC-91, "Work Procedure".

VDC OFF SWITCH

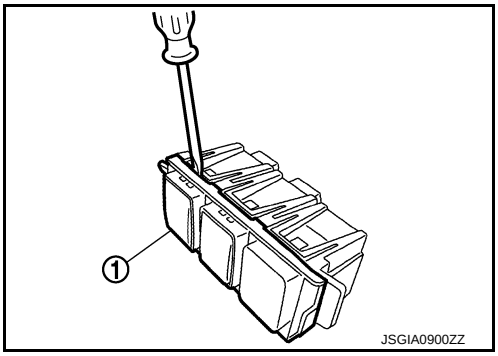
Removal and Installation

INFOID:0000000012793835

NOTE:
This is an integrated switch with switches for other functions.

REMOVAL

1. Remove lower instrument panel. Refer to IP-13, "Removal and Installation".
2. Remove switch panel. Refer to IP-13, "Removal and Installation".
3. Remove VDC OFF switch ①. from switch panel while pushing the pawl.



INSTALLATION

Installation is the reverse order of removal.

PRECAUTION

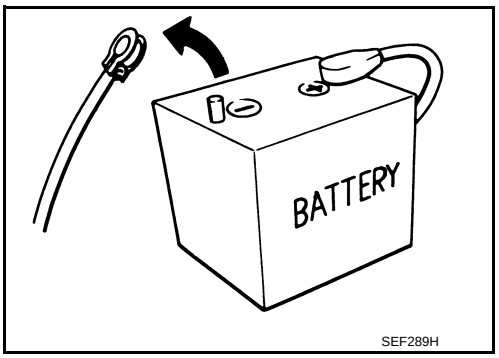
PRECAUTIONS

Precautions for Removing Battery Terminal

INFOID:0000000013398614

When disconnecting the battery terminal, pay attention to the following.
- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

BR08DE	: 4 minutes	V9X engine	: 4 minutes
D4D engine	: 20 minutes	YD25DDTi	: 2 minutes
HR09DET	: 12 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		



NOTE:
ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:
- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
  - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
  - Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:
If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

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

Precautions for FEB System Service

INFOID:0000000013398613

CAUTION:
- **Erase DTC when replacing parts of ICC system. Then check the operation of ICC system after radar alignment if necessary.**
- **Never change FEB system state ON/OFF without the consent of the customer.**
- **Turn the FEB system OFF in conditions similar to driving, such as free rollers or a chassis dynamometer.**

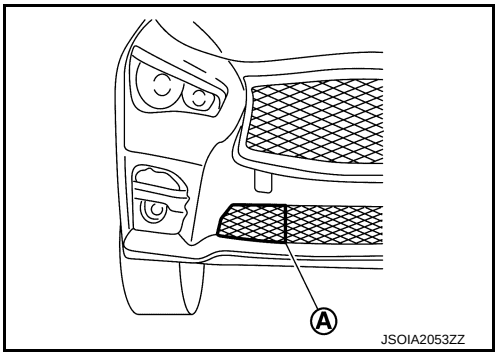
PRECAUTION FOR ICC SENSOR

- Never use the ICC sensor removed from vehicle. Never disassemble or remodel.

- Never install a part that the radar irradiation range Ⓐ is interfered with.
- If a part interferes with the radar irradiation range, then the following conditions are caused:

- The condition of ICC sensor becomes equal to an unclean condition, and this makes it difficult to measure the distance between cars.
- When it is impossible to measure the distance between cars, the following functions stop and DTC is detected.

- Forward Emergency Braking (FEB)
- Intelligent Cruise Control (ICC)
- Distance Control Assist (DCA)
- Predictive Forward Collision Warning (PFCW)

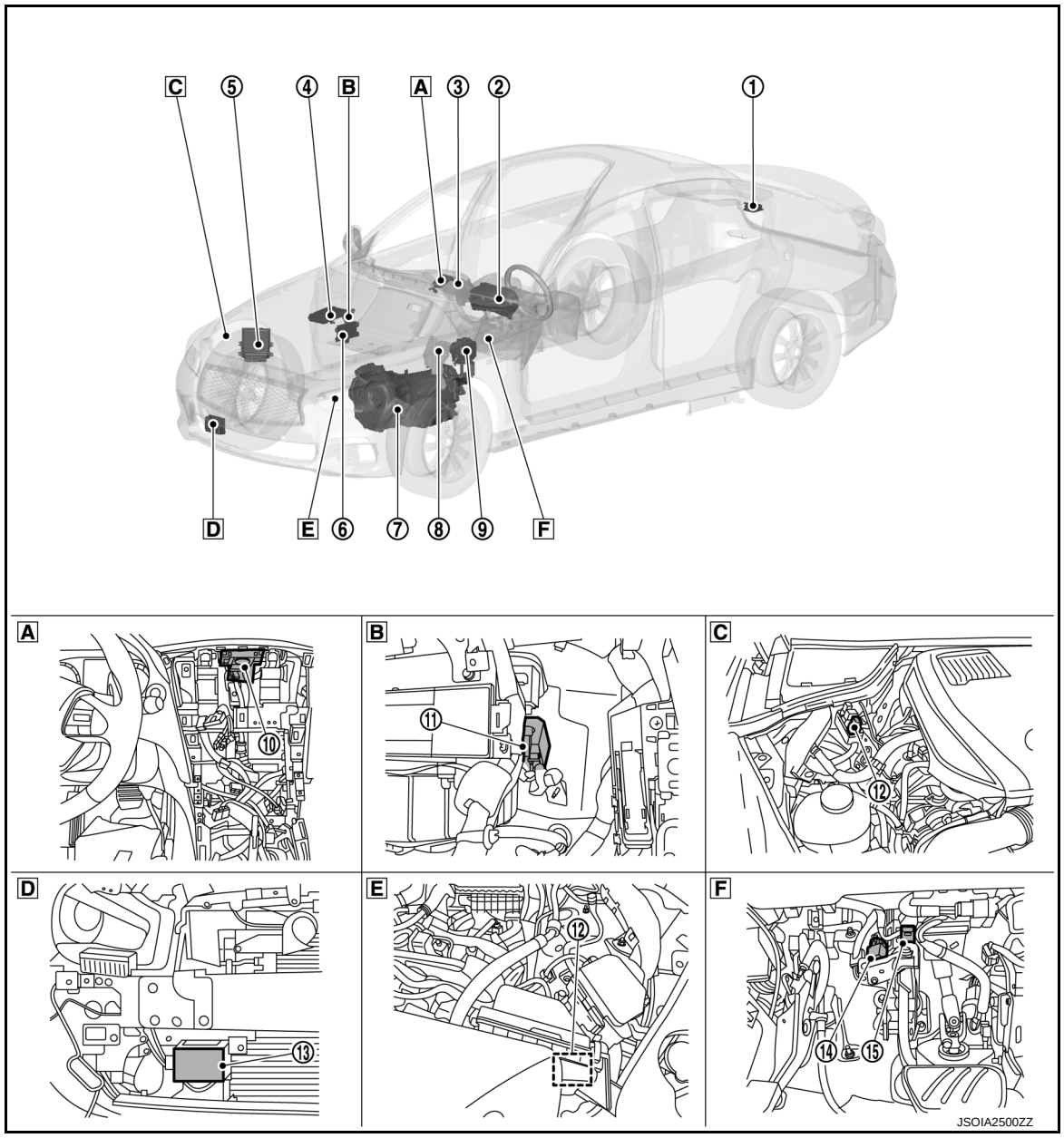


SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000012793837



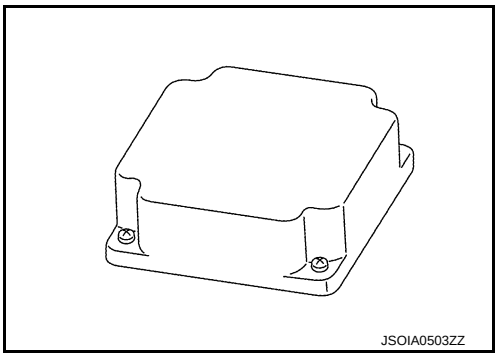
A	Instrument panel (Center)	B	Instrument lower panel (RH)	C	Engine room (RH) (2.0L turbo gasoline engine)
D	Front bumper (RH)	E	Engine room (LH) (VR30DDTT)	F	Upper side of brake pedal

No.	Component	Description
①	ADAS control unit	• Refer to BRC-202, "ADAS Control Unit" • Refer to DAS-16, "Component Parts Location" for detailed installation location.
②	Combination meter	• Performs the following operations using the signals received from the ADAS control unit via the CAN communication - Displays the FEB system operation status using the meter display signal - Illuminates the FEB warning lamp using the FEB warning lamp signal • Refer to MWI-8, "METER SYSTEM : Component Parts Location" for detailed installation location.
③	Display control unit	Display control unit transmits the system selection signal to ADAS control unit via CAN communication
④	ECM (2.0L turbo gasoline engine)	• ECM transmits the accelerator pedal position signal via CAN communication • Refer to EC4-25, "ENGINE CONTROL SYSTEM : Component Parts Location" for detailed installation location.
⑤	ECM (VR30DDTT)	• ECM transmits the accelerator pedal position signal via CAN communication • Refer to EC6-33, "ENGINE CONTROL SYSTEM : Component Parts Location" (USA and Canada), EC6-1024, "ENGINE CONTROL SYSTEM : Component Parts Location" (Mexico) for detailed installation location.
⑥	EMCM	• EMCM transmits the brake pedal switch signal to ADAS control unit via CAN communication • Refer to EC4-25, "ENGINE CONTROL SYSTEM : Component Parts Location" for detailed installation location.
⑦	TCM	• TCM transmits the signal related to A/T control to ADAS control unit via CAN communication • Refer to TM-13, "A/T CONTROL SYSTEM : Component Parts Location" for detailed installation location.
⑧	Accelerator pedal actuator	Accelerator pedal actuator receives an accelerator pedal feedback force control signal from the ADAS control unit via ITS communication and pushes back the accelerator pedal
⑨	ABS actuator and electric unit (control unit)	• ABS actuator and electric unit (control unit) transmits the vehicle speed signal (wheel speed), stop lamp signal and VDC/TCS/ABS system operation condition to ADAS control unit via CAN communication • ABS actuator and electric unit (control unit) controls the brake, based on a brake fluid pressure control signal received from ADAS control unit via CAN communication • Refer to BRC-10, "Component Parts Location" for detailed installation location.
⑩	Driver assistance buzzer	Refer to BRC-204, "Driver Assistance Buzzer"
⑪	Driver assistance buzzer control module	Refer to BRC-204, "Driver Assistance Buzzer Control Module"
⑫	ICC brake hold relay	Refer to BRC-203, "ICC Brake Hold Relay"
⑬	ICC sensor	Refer to BRC-203, "ICC Sensor"
⑭	Stop lamp switch	Refer to BRC-203, "Brake Pedal Position Switch / Stop Lamp Switch"
⑮	Brake pedal position switch	

ADAS Control Unit

INFOID:0000000013398628

- ADAS control unit is installed at trunk side of the parcel shelf.
- Communicates with each control unit via CAN communication/ITS communication/Chassis communication.
- ADAS control unit included gateway function, and necessary for system control signals are transmitted to each control unit between CAN communication and ITS communication by the ADAS control unit.
- ADAS control unit controls the each system, based on ITS communication signal, CAN communication signal, and chassis communication signal from each control unit.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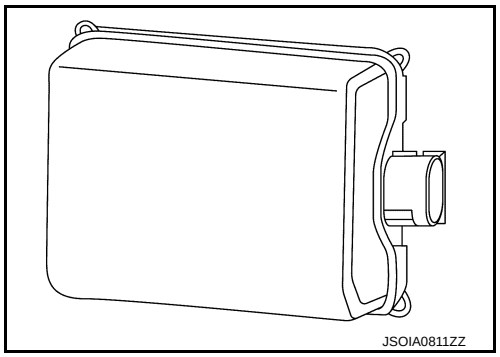
ICC Sensor

INFOID:0000000013398633

- ICC sensor is installed on the back of the front bumper and detects a vehicle ahead by using millimeter waves.
- ICC sensor detects radar reflected from a vehicle ahead by irradiating radar forward and calculates a distance from the vehicle ahead and relative speed, based on the detected signal.
- ICC sensor transmits the presence/absence of vehicle ahead and the distance from the vehicle to ADAS control unit via ITS communication.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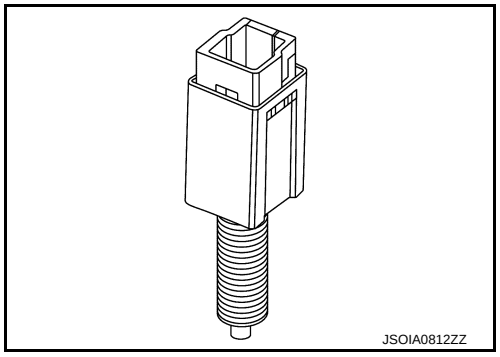
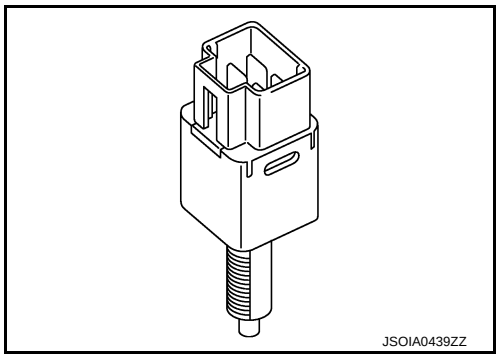
Brake Pedal Position Switch / Stop Lamp Switch

INFOID:0000000013398629

- Brake pedal position switch is installed at the upper part of the brake pedal and detects a brake operation performed by the driver.


JSOIA0812ZZ

- Brake pedal position switch is turned OFF when depressing the brake pedal.
- Brake pedal position switch signal is input to ECM. Brake pedal position switch signal is transmitted from ECM to ADAS control unit via CAN communication. (VR30DDTT)
- Brake pedal position switch signal is input to EMCM. Brake pedal position switch signal is transmitted from EMCM to ADAS control unit via CAN communication. (2.0 TURBO GASOLINE ENGINE)
- Stop lamp switch is installed at the upper part of the brake pedal and detects a brake operation performed by the driver.
- Stop lamp switch is turned ON, when depressing the brake pedal.
- Stop lamp switch signal is input to ECM and ABS actuator and electric unit (control unit). Stop lamp switch signals are transmitted from ECM and ABS actuator and electric unit (control unit) to ADAS control unit via CAN communication. (VR30DDTT)
- Stop lamp switch signal is input to BCM and ABS actuator and electric unit (control unit). Stop lamp switch signals are transmitted from BCM and ABS actuator and electric unit (control unit) to ADAS control unit via CAN communication. (2.0 TURBO GASOLINE ENGINE)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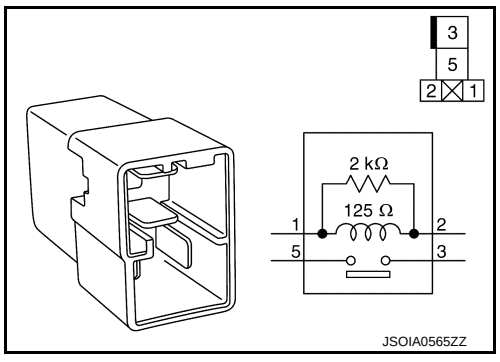
ICC Brake Hold Relay

INFOID:0000000013398634

- ICC brake hold relay is installed in the engine room (right side).
- When the brake is activated by the system, the ICC brake hold relay turns ON the stop lamp by bypassing the circuit of the stop lamp, according to a signal transmitted from the ADAS control unit.



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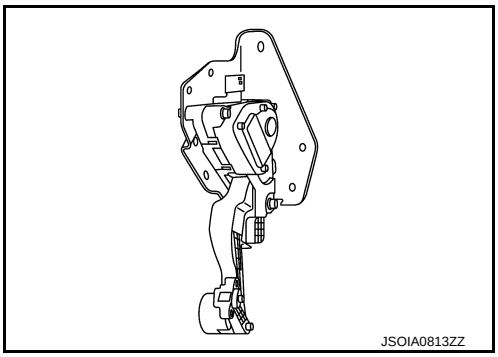
Accelerator Pedal Actuator

INFOID:0000000013398630

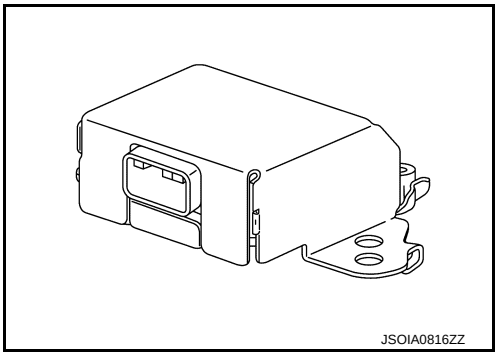
- Installed to the upper portion of the accelerator pedal, this consists of the accelerator pedal actuator together with the accelerator pedal position sensor, and is linked with the accelerator pedal.
- If accelerator pedal feedback force control signal is received from ADAS control unit via ITS communication, it operates the integrated motor for applying control to move the accelerator pedal upward.



Driver Assistance Buzzer Control Module

INFOID:0000000013398631

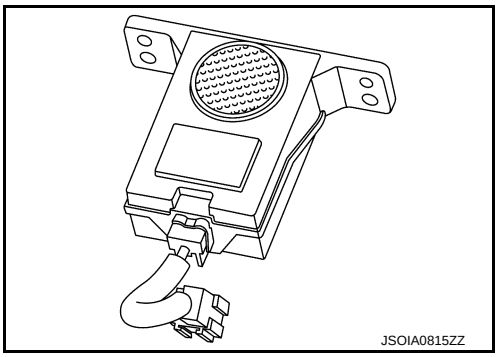
- Driver assistance buzzer control module is installed at the behind of glove box.
- When driver assistance buzzer signal is received from the ADAS control unit, the driver assistance buzzer control module transmits the warning buzzer signal to driver assistance buzzer.



Driver Assistance Buzzer

INFOID:0000000013398632

- Driver assistance buzzer is installed at the behind the display control unit.
- When a warning buzzer signal is received from the driver assistance buzzer control module, the driver assistance buzzer sounds a buzzer.



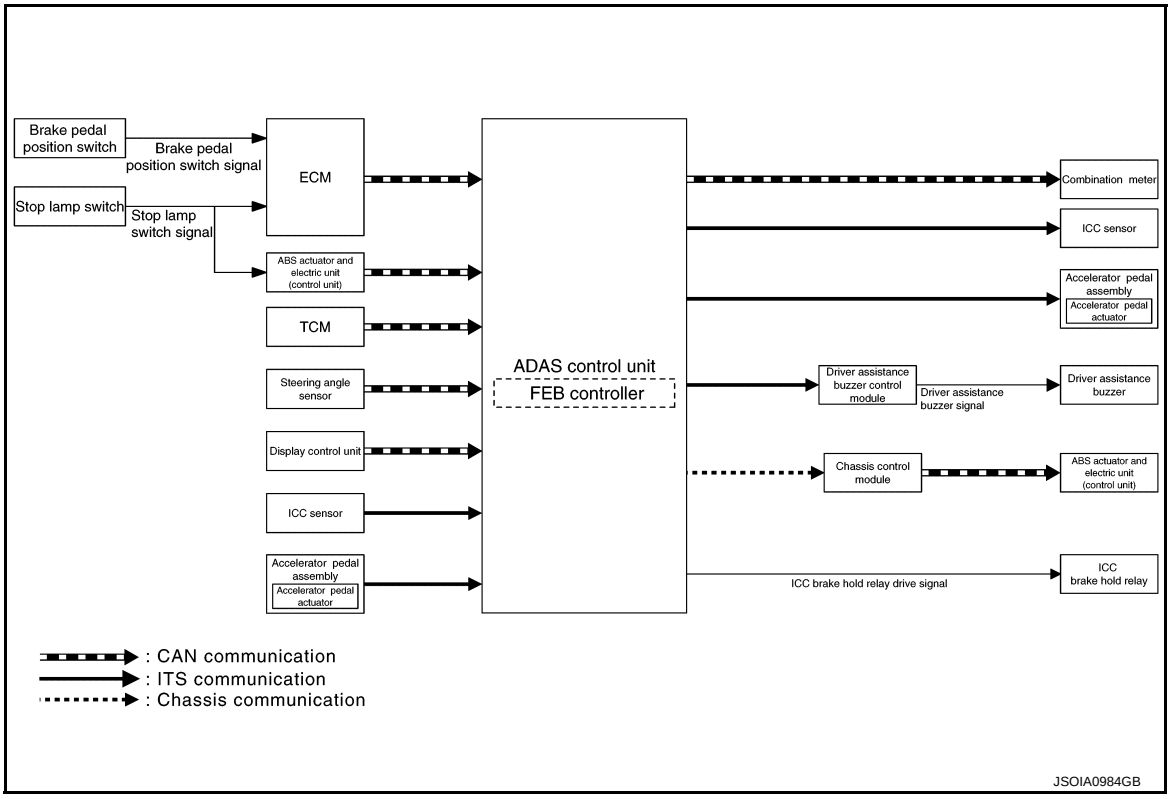
SYSTEM

System Description

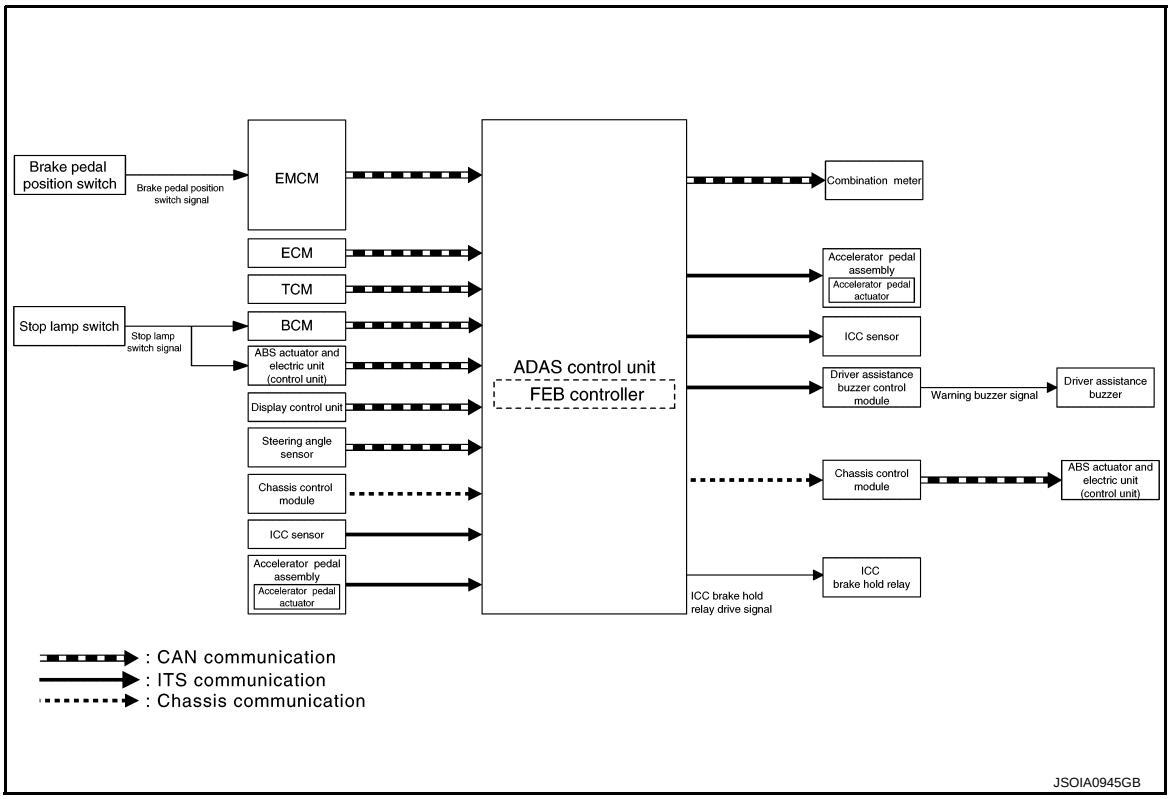
INFOID:0000000012793845

SYSTEM DIAGRAM

VR30DDTT



2.0 TURBO GASOLINE ENGINE



NOTE:

TCM is connected to drivetrain CAN communication and transmits a CAN communication signal to ADAS control unit via ECM.

ADAS CONTROL UNIT INPUT/OUTPUT SIGNAL ITEM

Input Signal Item

Transmit unit	Signal name		Description
ECM	CAN communication	Closed throttle position signal	Receives idle position state (ON/OFF)
		Accelerator pedal position signal	Receives accelerator pedal position (angle)
		Engine speed signal	Receives engine speed
		Stop lamp switch signal	Receives an operational state of the brake pedal
		Brake pedal position switch signal*1	Receives an operational state of the brake pedal
EMCM*2	CAN communication	Brake pedal position switch signal	Receives an operational state of the brake pedal
TCM (Via ECM)*2	CAN communication	Input speed signal	Receives the number of revolutions of input shaft
		Current gear position signal	Receives a current gear position
		Shift position signal	Receives a selector lever position
		Output shaft revolution signal	Receives the number of revolutions of output shaft
ABS actuator and electric unit (control unit)	CAN communication	ABS malfunction signal	Receives a malfunction state of ABS
		ABS operation signal	Receives an operational state of ABS
		ABS warning lamp signal	Receives an ON/OFF state of ABS warning lamp
		TCS malfunction signal	Receives a malfunction state of TCS
		TCS operation signal	Receives an operational state of TCS
		VDC OFF switch signal	Receives an ON/OFF state of VDC
		VDC malfunction signal	Receives a malfunction state of VDC
		VDC operation signal	Receives an operational state of VDC
		Vehicle speed signal (ABS)	Receives wheel speeds of four wheels
		Yaw rate signal	Receives yaw rate acting on the vehicle
		Stop lamp switch signal	Receives an operational state of the brake pedal
Steering angle sensor	CAN communication	Steering angle sensor malfunction signal	Receives a malfunction state of steering angle sensor
		Steering angle sensor signal	Receives the number of revolutions, turning direction of the steering wheel
		Steering angle speed signal	Receives the turning angle speed of the steering wheel
Display control unit	CAN communication	System selection signal	Receives a selection state of each item in “Driver Aids” selected with the integral switch
ICC sensor	ITS communication	ICC sensor signal	Receives detection results, such as the presence or absence of a leading vehicle and distance from the vehicle
Accelerator pedal actuator	ITS communication	Accelerator pedal actuator operation status signal	Receives an operational state of accelerator pedal actuator

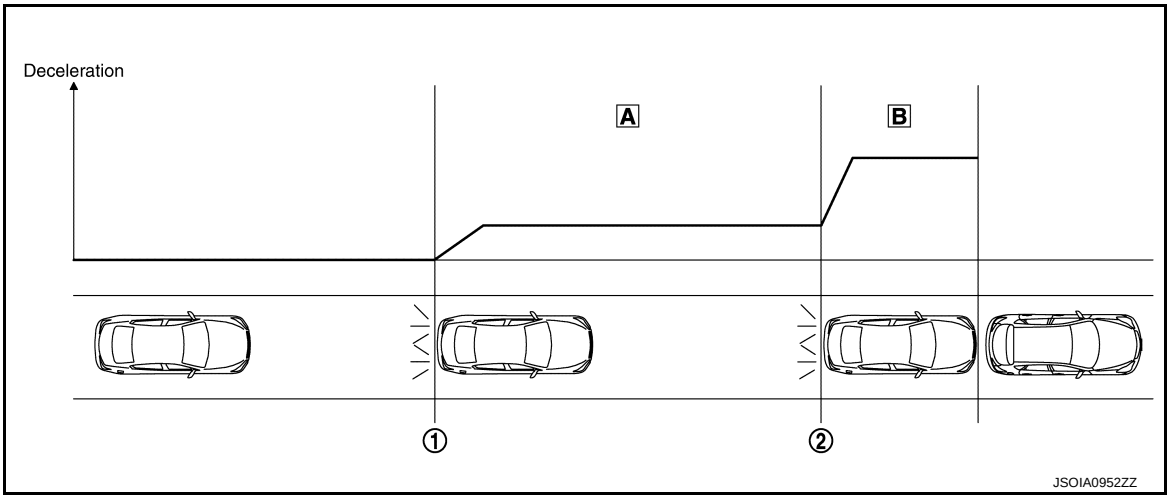
*1: VR30DDTT ENGINE
*2: 2.0 TURBO GASOLINE ENGINE

Output Signal Item

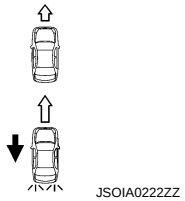
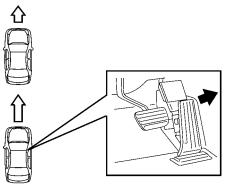
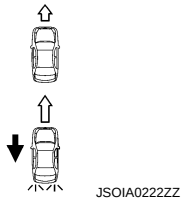
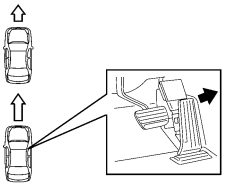
Reception unit	Signal name			Description
ABS actuator and electric unit (control unit)	CAN communication	Brake fluid pressure control signal		Transmits a brake fluid pressure control signal to activates the brake
Combination meter	CAN communication	Meter display signal	Vehicle ahead detection indicator signal	Transmits a signal to display a state of the system on the information display
			FEB/PFCW system display signal	
			FEB warning signal	
ICC sensor	ITS communication	Vehicle speed signal		Transmits a vehicle speed calculated by the ADAS control unit
		Steering angle sensor signal		Transmits a steering angle sensor signal received from the steering angle sensor
Accelerator pedal actuator	ITS communication	Accelerator pedal position signal		Transmits an accelerator pedal angle calculated by the ADAS control unit
		Accelerator pedal feedback force control signal		Transmits a target actuation force value calculated by the ADAS control unit
Driver assistance buzzer control module	ITS communication	Driver assistance buzzer signal		Transmits a driver assistance buzzer signal to active the buzzer
ICC brake hold relay	ICC brake hold relay drive signal			Activates the brake hold relay and turns ON the stop lamp

FUNCTION DESCRIPTION

- The FEB system measures the distance from a vehicle ahead using the ICC sensor installed in the front bumper.
- When the system judges that a vehicle is being approached, “approach warning” is displayed in the combination meter and at the same time a warning chime sounds, the accelerator pedal is moved upward, and the brake is operated.
- When it is further judged that the vehicle may collide with the vehicle ahead, the system operates the brake strongly to avoid collision while it displays FEB warning on the combination meter and rings a warning chime.



① Start of warning and partial brake
② Start of harder brake
A Applies partial braking and moves the accelerator pedal to upward direction
B Harder brake

Situation		Brake	Accelerator pedal actuator	Warning
No obstacle approached		No operation	No operation	—
①	Start of warning and partial brake	Partial brake  JSOIA0222ZZ	Operation  JSOIA0094ZZ	• Sounds the buzzer • Blinks vehicle ahead indicator
②	Start of harder brake	Harder brake  JSOIA0222ZZ	Operation  JSOIA0094ZZ	• Sounds the buzzer (Higher pitched buzzer) • Indicates FEB warning

CAUTION:

It is the driver′s responsibility to stay alert, drive safely and be in control of the vehicle at all times. As there is a performance limit, it may not provide a warning or brake in certain conditions.

NOTE:

The FEB system shares component parts and diagnosis with the ICC/DCA system.

OPERATION DESCRIPTION

- The ICC sensor measures the distance from the obstacle ahead and transmits the ICC sensor signal to the ADAS control unit.
- The ADAS control unit judges the possibility of a collision from the ICC sensor signal and the vehicle speed.
- The ADAS control unit performs the following operations according to the degree of possibility of a collision.
- Transmits the driver assistance buzzer signal to the driver assistance buzzer control module and sounds the buzzer.
- Transmits the meter display signal to the combination meter and displays the vehicle ahead indicator/FEB warning.
- Transmits the accelerator pedal feedback force signal to the accelerator pedal actuator and moves the accelerator pedal upward to assist the driver to release the accelerator pedal.
- Transmits the brake fluid pressure control signal to the ABS actuator and electric unit (control unit) via chassis control module and performs the brake control
- Transmits the ICC brake hold relay drive signal to the ICC brake hold relay and turns ON the stop lamp.

NOTE:

- ON/OFF of FEB/PFCW system is performed with the integral switch.
- The system ON/OFF condition will be memorized even if the ignition switch turns OFF.
- The FEB system operates under the following conditions.
- The FEB system will function when the vehicle is driven at speeds of approximately 5 km/h (3 MPH) and above, and when the vehicle′s speed is approximately 5 km/h (3 MPH) faster than that of the vehicle ahead.
- Setting of FEB is performed in synchronization with the log-in function of on-board personal assistant. For details of the log-in function, refer to DMS-17, "LOG-IN FUNCTION : System Description".

Operation Condition

ADAS control unit performs the control when the following conditions are satisfied.

- When the FEB/PFCW system setting on the integral switch is ON.
- When the vehicle speed is above approximately 5 km/h (3 MPH).
- There is a possibility of a collision with the vehicle ahead.

No Operation Condition

The ADAS control unit is not operate when the system is under the conditions of the no operation condition.

- When the FEB system setting on the integral switch is OFF.
- When the vehicle ahead is not detected.

Operation Cancellation Condition

The ADAS control unit cancels the operation when the system is under any conditions of the operation cancellation condition.

- When the system judges that the vehicle comes to a standstill by the system control.
- When the system malfunction occurs.
- When the ICC sensor area of the front bumper is dirty and the measurement of the distance between the vehicles becomes difficult.

Fail-safe (ADAS Control Unit)

INFOID:0000000013399006

If a malfunction occurs in each system, ADAS control unit cancels each control, sounds a beep, and turns ON the warning or indicator lamp.

System	Buzzer	Warning lamp/Warning display	Description
Vehicle-to-vehicle distance control mode	High-pitched tone	ICC system warning	Cancel
Conventional (fixed speed) cruise control mode	High-pitched tone	ICC system warning	Cancel
Forward Emergency Braking (FEB)	High-pitched tone	• FEB warning lamp • Warning systems indicator (Forward position: Yellow)	Cancel
Predictive Forward Collision Warning (PFCW)	High-pitched tone	Warning systems indicator (Forward position: Yellow)	Cancel
Distance Control Assist (DCA)	High-pitched tone	Warning systems indicator (Forward position: Yellow)	Cancel
Lane Departure Warning (LDW)	—	Warning systems indicator (Lane position: Yellow)	Cancel
Lane Departure Prevention (LDP)	Low-pitched tone	Warning systems indicator (Lane position: Yellow)	Cancel
Blind Spot Warning (BSW)	—	Warning systems indicator (Blind spot position: Yellow)	Cancel
Blind Spot Intervention	Low-pitched tone	Warning systems indicator (Blind spot position: Yellow)	Cancel
Back-up Collision Intervention (BCI)	High-pitched tone	BCI system warning	Cancel

WARNING/INDICATOR/CHIME LIST

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

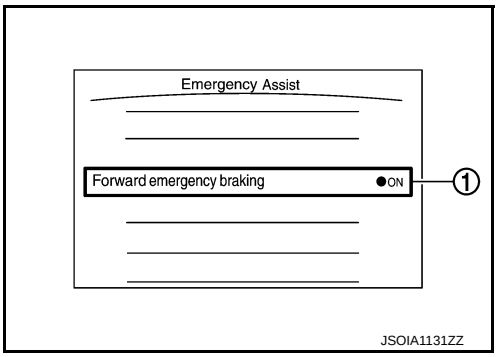
INFOID:0000000012793847

Name	Design	Function
FEB warning lamp		• For layout, refer to MWI-9, "METER SYSTEM : Design". • For function, refer to MWI-28, "WARNING LAMPS/INDICATOR LAMPS : FEB Warning Lamp".

OPERATION

Switch Name and Function

INFOID:0000000012793848

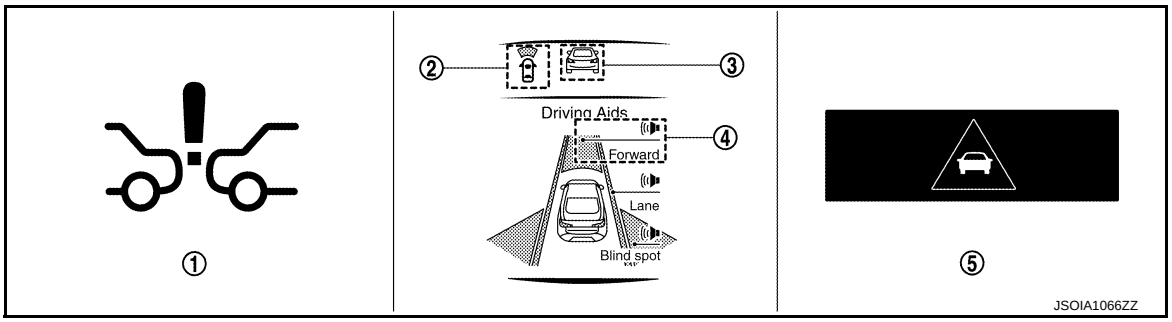


No.	Switch name	Description
①	FEB system setting screen (Integral switch settings screen)	The setting of FEB/PFCW system can be switched between ON and OFF

Menu Displayed by Pressing Each Switch

INFOID:0000000012793849

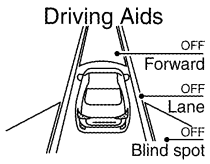
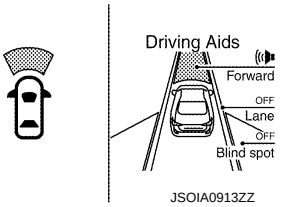
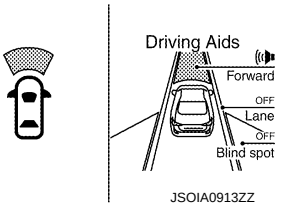
SYSTEM DISPLAY



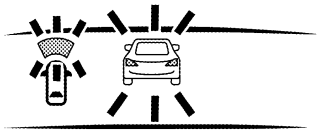
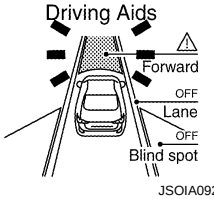
No.	Switch name	Description
①	FEB warning lamp	• FEB warning lamp indicates that an abnormal condition is present in FEB system • When the FEB system turns OFF, the FEB warning lamp will illuminate.
②	FEB system indicator (Warning systems indicator)	Indicates that FEB/PFCW systems are ON
③	Vehicle ahead detection indicator	• Indicates whether it detects a vehicle ahead • Blinks when approaching vehicle ahead
④	FEB system indicator “Forward” position (Speaker icon) (Warning systems indicator)	Indicates that FEB/PFCW system is ON
⑤	FEB warning	Displays immediately before the harder brake operates

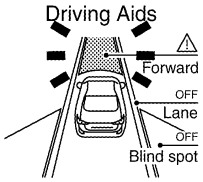
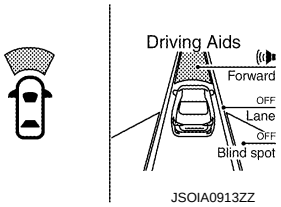
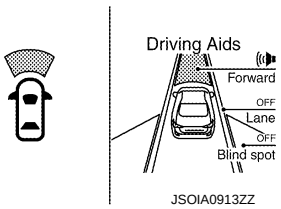
DISPLAY AND WARNING

Warning Display

System status	Condition	Display on combination meter	FEB warning lamp	Buzzer
FEB/PFCW OFF	—	 JSOIA0911ZZ	ON	—
FEB/PFCW ON	System ON	 JSOIA0913ZZ	OFF	—
FEB/PFCW system malfunction	The FEB/PFCW system is automatically canceled. **NOTE:** The system operates if the ignition switch is turned OFF⇒ON after the condition improves	 JSOIA0913ZZ  JSOIA0932ZZ Malfunction See Owner's Manual	ON	Beep

Warning Operation

Condition	Action	Display on combination meter	FEB warning lamp	Chime
There is a possibility of a collision with the vehicle ahead	• Accelerator pedal actuation • Operates brake (Partial)	 JSOIA0921ZZ  JSOIA0922ZZ	OFF	Beep

Condition	Action	Display on combination meter	FEB warning lamp	Chime
An obstacle ahead is avoided due to the system applying braking.	Operates brake (Emergency)	 JSOIA0957ZZ	OFF	Continuous beeps
		 JSOIA0922ZZ		
Dirt around the ICC sensor	The FEB system is automatically canceled. **NOTE:** The system operates if the ignition switch is turned OFF⇒ON after the condition improves	 JSOIA0913ZZ	ON	Beep
		 JSOIA0932ZZ		
		Unavailable Front Radar Obstruction		
Accelerator pedal high temperature	The FEB system is automatically canceled. **NOTE:** The system operates if the ignition switch is turned OFF⇒ON after the condition improves	 JSOIA0913ZZ	ON	Beep
		 JSOIA0932ZZ		
		Unavailable High Accelerator Temperature		

HANDLING PRECAUTION

Description

INFOID:0000000012793850

PRECAUTIONS FOR FORWARD EMERGENCY BRAKING

- The forward emergency braking system is a supplemental aid to the driver. It is not a replacement for the driver′s attention to traffic conditions or responsibility to drive safely. It cannot prevent accidents due to carelessness or dangerous driving techniques.
- The forward emergency braking system does not function in all driving, traffic, weather and road conditions.
- The automatic braking will cease under the following conditions:
- When the steering wheel is turned as far as necessary to avoid a collision.
- When the accelerator pedal is depressed.
- When there is no longer a vehicle detected ahead.
- If the forward emergency braking system has stopped the vehicle, the vehicle will remain at a standstill for approximately 2 seconds before the brakes are released.
- The system will not detect the following objects:
- Pedestrians, animals, or obstacles in the roadway
- Oncoming vehicles in the same lane
- Crossing vehicles
- The radar sensor has some performance limitations. For stationary vehicles, the forward emergency braking system can function at speeds up to approximately 70 km/h (45 MPH).
- The radar sensor may not detect a vehicle ahead in the following conditions:
- Dirt, ice, snow or other material covering the radar sensor.
- Interference by other radar sources.
- Snow or road spray from traveling vehicles.
- If the vehicle ahead is narrow (e.g.motorcycle)
- When driving on a steep downhill slope or roads with sharp curves.
- In some road or traffic conditions, the forward emergency braking system may unexpectedly push the accelerator pedal up or apply partial braking. When acceleration is necessary, continue to depress the accelerator pedal to override the system.
- Braking distances increase on slippery surfaces.
- Excessive noise will interfere with the warning chime sound, and the chime may not be heard.

ECU DIAGNOSIS INFORMATION

ADAS CONTROL UNIT

Reference Value

INFOID:0000000013399008

VALUES ON THE DIAGNOSIS TOOL

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

Monitor item	Condition		Value/Status
MAIN SW	Ignition switch ON	When MAIN switch is pressed	On
		When MAIN switch is not pressed	Off
SET/COAST SW	Ignition switch ON	When SET/COAST switch is pressed	On
		When SET/COAST switch is not pressed	Off
CANCEL SW	Ignition switch ON	When CANCEL switch is pressed	On
		When CANCEL switch is not pressed	Off
RESUME/ACC SW	Ignition switch ON	When RESUME/ACCELERATE switch is pressed	On
		When RESUME/ACCELERATE switch is not pressed	Off
DISTANCE SW	Ignition switch ON	When DISTANCE switch is pressed	On
		When DISTANCE switch is not pressed	Off
CRUISE OPE	Drive the vehicle and activate the vehicle-to-vehicle distance control mode	When ICC system is controlling	On
		When ICC system is not controlling	Off
BRAKE SW	Ignition switch ON	When brake or clutch pedal is depressed	Off
		When brake or clutch pedal is not depressed	On
STOP LAMP SW	Ignition switch ON	When brake pedal is depressed	On
		When brake pedal is not depressed	Off
IDLE SW	Engine running	Idling	On
		Except idling (depress accelerator pedal)	Off
SET DISTANCE	• Start the engine and turn the ICC system ON • Press the DISTANCE switch to change the vehicle-to-vehicle distance setting	When set to “long”	Long
		When set to “middle”	Mid
		When set to “short”	Short
CRUISE LAMP	Start the engine and press MAIN switch	ICC system ON (MAIN switch indicator ON)	On
		ICC system OFF (MAIN switch indicator OFF)	Off
OWN VHCL	**NOTE:** The item is indicated, but not monitored		Off
VHCL AHEAD	Drive the vehicle and activate the vehicle-to-vehicle distance control mode	When a vehicle ahead is detected (vehicle ahead detection indicator ON)	On
		When a vehicle ahead is not detected (vehicle ahead detection indicator OFF)	Off
ICC WARNING	Start the engine and press MAIN switch	When ICC system is malfunctioning (ICC system malfunction ON)	On
		When ICC system is normal (ICC system malfunction OFF)	Off

Monitor item	Condition		Value/Status
VHCL SPEED SE	While driving		Displays the vehicle speed calculated by ADAS control unit
SET VHCL SPD	While driving	When vehicle speed is set	Displays the set vehicle speed
BUZZER O/P	Engine running	When the buzzer of the following system operates • Vehicle-to-vehicle distance control mode • DCA system • PFCW system • FEB system	On
		When the buzzer of the following system not operates • Vehicle-to-vehicle distance control mode • DCA system • PFCW system • FEB system	Off
THRTL SENSOR	**NOTE:** The item is indicated, but not monitored		0.0
ENGINE RPM	Engine running		Equivalent to tachometer reading
WIPER SW	Ignition switch ON	Wiper not operating	Off
		Wiper LO operation	Low
		Wiper HI operation	High
YAW RATE	**NOTE:** The item is indicated, but not monitored		0.0
BA WARNING	Engine running	FEB OFF indicator lamp ON • When FEB system is malfunctioning • When FEB system is turned to OFF	On
		FEB OFF indicator lamp OFF • When FEB system is normal • When FEB system is turned to ON	Off
STP LMP DRIVE	Drive the vehicle and activate the vehicle-to-vehicle distance control mode	When ICC brake hold relay is activated	On
		When ICC brake hold relay is not activated	Off
D RANGE SW	Engine running	When the selector lever is in “D” position or manual mode	On
		When the selector lever is in any position other than “D” or manual mode	Off
NP RANGE SW	Engine running	When the selector lever is in “N”, “P” position	On
		When the selector lever is in any position other than “N”, “P”	Off
PKB SW	Ignition switch ON	When the parking brake is applied	On
		When the parking brake is released	Off
PWR SUP MONI	Engine running		Power supply voltage value of ADAS control unit
VHCL SPD AT	While driving		Value of A/T vehicle speed sensor signal
THRTL OPENING	Engine running	Depress accelerator pedal	Displays the throttle position

Monitor item	Condition		Value/Status
GEAR	While driving		Displays the gear position
CLUTCH SW SIG	Ignition switch ON	**NOTE:** The item is indicated, but not monitored.	Off
NP SW SIG	Ignition switch ON	When the shift lever is in neutral position	On
		When the shift lever is in any position other than neutral	Off
MODE SIG	Start the engine and press MAIN switch	When ICC system is deactivated	Off
		When vehicle-to-vehicle distance control mode is activated	ICC
		When conventional (fixed speed) cruise control mode is activated	ASCD
SET DISP IND	• Drive the vehicle and activate the conventional (fixed speed) cruise control mode • Press SET/COAST switch	SET switch indicator ON	On
		SET switch indicator OFF	Off
DISTANCE	Drive the vehicle and activate the vehicle-to-vehicle distance control mode	When a vehicle ahead is detected	Displays the distance from the preceding vehicle
		When a vehicle ahead is not detected	0.0
RELATIVE SPD	Drive the vehicle and activate the vehicle-to-vehicle distance control mode	When a vehicle ahead is detected	Displays the relative speed.
		When a vehicle ahead is not detected	0.0
ON ROOT GUIDANCE	**NOTE:** The item is indicated, but not monitored		Off
DYNA ASIST SW	Ignition switch ON	When dynamic driver assistance switch is pressed	On
		When dynamic driver assistance switch is not pressed	Off
DCA ON IND	Start the engine and press dynamic driver assistance switch (When DCA setting is ON)	DCA system OFF	Off
		DCA system ON	On
DCA VHL AHED	Drive the vehicle and activate the DCA system	When a vehicle ahead is not detected (vehicle ahead detection indicator OFF)	Off
		When a vehicle ahead is detected (vehicle ahead detection indicator ON)	On
IBA SW	**NOTE:** The item is indicated, but not monitored		Off
FCW SYSTEM ON	Ignition switch ON	When the PFCW system is ON	On
		When the PFCW system is OFF	Off
APA TEMP	Engine running		Display the accelerator pedal actuator integrated motor temperature
APA PWR	Ignition switch ON		Power supply voltage value of accelerator pedal actuator
NAVI-ICC DISP	**NOTE:** The item is indicated, but not monitored		Off
LDW SYSTEM ON	Ignition switch ON	When the LDW system is ON	On
		When the LDW system is OFF	Off

Monitor item	Condition		Value/Status
LDW ON LAMP	Ignition switch ON	When the LDW system is ON	On
		When the LDW system is OFF	Off
LDP ON IND	Start the engine and press dynamic driver assistance switch (When LDP system setting is ON)	When the LDW system is ON	On
		When the LDW system is OFF	Off
LANE DPRT W/L	Drive the vehicle and activate the LDW system or LDP system	Lane departure warning lamp ON	On
		Lane departure warning lamp OFF	Off
LDW BUZER OUTPUT	Drive the vehicle and activate the LDW/LDP system or Blind Spot Warning/Blind Spot Intervention system	When the buzzer of the following system operates • LDW/LDP system • Blind Spot Warning/Blind Spot Intervention system	On
		When the buzzer of the following system does not operate • LDW/LDP system • Blind Spot Warning/Blind Spot Intervention system	Off
LDP SYSTEM ON	Start the engine and press dynamic driver assistance switch (When LDP system setting is ON)	When the LDP system is ON	On
		When the LDP system is OFF	Off
WARN REQ	Drive the vehicle and activate the LDP system	Lane departure warning is operating	On
		Lane departure warning is not operating	Off
READY signal	Start the engine and press dynamic driver assistance switch (When LDP system setting is ON)	When the LDP system is ON	On
		When the LDP system is OFF	Off
Camera lost	Drive the vehicle and activate the LDW system, LDP system or Blind Spot Intervention system	Both side lane markers are detected	Detect
		Deviate side lane marker is lost	Deviate
		Both side lane markers are lost	Both
Lane unclear	While driving	Lane marker is unclear	On
		Lane marker is clear	Off
STATUS signal	Drive the vehicle and activate the LDP system	When the LDP system is ON	Stnby
		When the LDP system is operating	Warn
		When the LDP system is canceled	Cancl
		When the LDP system is OFF	Off
Shift position	• Engine running • While driving		Displays the shift position
Turn signal	Turn signal lamps OFF		Off
	Turn signal lamp LH blinking		LH
	Turn signal lamp RH blinking		RH
	Turn signal lamp LH and RH blinking		LH&RH
SIDE G	While driving	Vehicle turning right	Negative value
		Vehicle turning left	Positive value
STATUS signal	Drive the vehicle and activate the LDP system	When the LDP system is ON	Stnby
		When the LDP system is operating	Warn
		When the LDP system is canceled	Cancl
		When the LDP system is OFF	Off
Lane unclear	While driving	Lane marker is unclear	On
		Lane marker is clear	Off
FUNC ITEM	Ignition switch ON		FUNC3

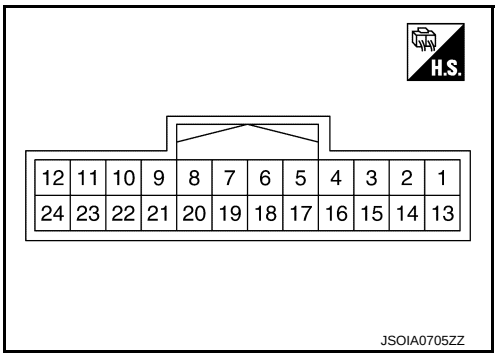
Monitor item	Condition		Value/Status
FUNC ITEM (FCW)	Engine running	“Forward Emergency Braking” set with the integral switch is ON	On
		“Forward Emergency Braking” set with the integral switch is OFF	Off
FUNC ITEM (LDW)	Engine running	“Lane Departure Warning” set with the integral switch is ON	On
		“Lane Departure Warning” set with the integral switch is OFF	Off
FUNC ITEM (BSW)	Engine running	“Blind Spot Warning” set with the integral switch is ON	On
		“Blind Spot Warning” set with the integral switch is OFF	Off
FUNC ITEM (NV-ICC)	**NOTE:** The item is indicated, but not monitored		Off
FUNC ITEM (NV-DCA)	**NOTE:** The item is indicated, but not monitored		Off
DCA SELECT	Ignition switch ON	“Distance Control Assist” set with the integral switch is ON	On
		“Distance Control Assist” set with the integral switch is OFF	Off
LDP SELECT	Ignition switch ON	“Lane Departure Intervention” set with the integral switch is ON	On
		“Lane Departure Intervention” set with the integral switch is OFF	Off
BSI SELECT	Ignition switch ON	“Blind Spot Intervention” set with the integral switch is ON	On
		“Blind Spot Intervention” set with the integral switch is OFF	Off
FCW SELECT	Ignition switch ON	“Forward Emergency Braking” set with the integral switch is ON	On
		“Forward Emergency Braking” set with the integral switch is OFF	Off
LDW SELECT	Ignition switch ON	“Lane Departure Warning” set with the integral switch is ON	On
		“Lane Departure Warning” set with the integral switch is OFF	Off
BSW SELECT	Ignition switch ON	“Blind Spot Warning” set with the integral switch is ON	On
		“Blind Spot Warning” set with the integral switch is OFF	Off
NAVI ICC SELECT	**NOTE:** The item is indicated, but not monitored		Off
NAVI DCA SELECT	**NOTE:** The item is indicated, but not monitored		Off
SYS SELECTABILITY	Ignition switch ON	Items set with the integral switch can be switched normally	On
		Items set with the integral switch cannot be switched normally	Off
DRIVE MODE STATS	Ignition switch ON	When drive mode select switch position is STANDARD	STD
		When drive mode select switch position is in SPORT	SPORT
		When drive mode select switch position is in ECO	ECO
		When drive mode select switch position is in SNOW	SNOW
		When drive mode select switch position is in PERSONAL	STD
		A signal other than those above is input	ERROR

Monitor item	Condition		Value/Status
WARN SYS SW	**NOTE:** The item is indicated, but not monitored		Off
BSW/BSI WARN LMP	Ignition switch ON	When the BSW system is malfunctioning	On
		When the BSW system is normal	Off
BSI ON IND	Ignition switch ON	Blind Spot Intervention warning ON	On
		Blind Spot Intervention warning OFF	Off
BSW SYSTEM ON	Ignition switch ON	When the BSW system is ON	On
		When the BSW system is OFF	Off
BSI SYSTEM ON	Start the engine and press dynamic driver assistance switch (When Blind Spot Intervention system setting is ON)	When the Blind Spot Intervention system is ON	On
		When the Blind Spot Intervention system is OFF	Off
FCW SYSTEM ON	Engine running	When the FEB/PFCW system is ON	On
		When the FEB/PFCW system is OFF	Off
BCI SYSTEM ON	Engine running	When the BCI system is ON	On
		When the BCI system is OFF	Off
BCI SWITCH	**NOTE:** The item is indicated, but not monitored		Off
BATTERY CIRCUIT OFF	**NOTE:** The item is indicated, but not used		Off
LDP WARNING INDICATOR	Engine running	When the LDP system is malfunctioning	On
		When the LDP system is normal	Off
LDW ON INDICATOR	Ignition switch ON	LDW system display ON	On
		LDW system display OFF	Off
LDW WARNING INDICATOR	Ignition switch ON	When the LDW system is malfunctioning	On
		When the LDW system is normal	Off
SYSTEM CANCEL MESSAGE	Ignition switch ON	When the vehicle is normal	NOREQ
		When the wheel is slipping	SLIP
		When the drive mode selector is SNOW mode	SNOW
		When the VDC is OFF	VDC OFF
CAMERA HI TEMP MSG	Ignition switch ON	Lane camera unit high temperature warning display ON	On
		Lane camera unit high temperature warning display OFF	Off
ITS SETTING ITEM(DCA)	Ignition switch ON		On
ITS SETTING ITEM(LDP)	Ignition switch ON		On
ITS SETTING ITEM(BSI)	Ignition switch ON		On
BSI WARNING INDICATOR	Engine running	When the Blind Spot Intervention is malfunctioning	On
		When the Blind Spot Intervention is normal	Off
BSW ON INDICATOR	Ignition switch ON	BSW system display ON	On
		BSW system display OFF	Off
SIDE RADAR BLOCK COND	Ignition switch ON	Front bumper or side radar is dirty	On
		Front bumper and side radar is clean	Off
LDW WARNING ALERT TIMING	Ignition switch ON	LDW system OFF	Nothing
		Lane departure warning timing is early setting	Early
		Lane departure warning timing is late setting	Late

Monitor item	Condition		Value/Status
BSW IND BRIGHTNESS	Ignition switch ON	BSW system OFF	Nothing
		Blind Spot Warning/Blind Spot Intervention indicator brightness bright	Bright
		Blind Spot Warning/Blind Spot Intervention indicator brightness normal	Normal
		Blind Spot Warning/Blind Spot Intervention indicator brightness dark	Dark
SL MAIN SW	Engine running	When speed limiter MAIN switch is pressed	On
		When speed limiter MAIN switch is not pressed	Off
FUNC ITEM (FEB)	Engine running	"Forward Emergency Braking" set with the integral switch is ON	On
		"Forward Emergency Braking" set with the integral switch is OFF	Off
FEB SELECT	Ignition switch ON	“Forward Emergency Braking” set with the integral switch is ON	On
		“Forward Emergency Braking” set with the integral switch is OFF	Off
FEB SW	Engine running	FEB system ON	On
		FEB system OFF	Off
SL TARGET VEHICLE SPEED	While driving	When vehicle speed is set	Displays the set vehicle speed
SL SET LAMP	• Drive the vehicle and activate the speed limiter • Press speed limiter MAIN switch	Speed limiter SET indicator ON	On
		Speed limiter SET indicator OFF	Off
SL LIMIT LAMP	• Drive the vehicle and activate the speed limiter • Press speed limiter MAIN switch	Speed limiter system ON	On
		Speed limiter system OFF	Off
ASCD CANCEL (LOW SPEED)	Drive the vehicle and activate the ASCD	ASCD cancelled by low vehicle speed	On
		Other than above	Off
ASCD CANCEL (SPEED DIFF)	Drive the vehicle and activate the ASCD	ASCD cancelled by difference between set speed and vehicle speed	On
		Other than above	Off
KICK DOWN	Drive the vehicle and activate the speed limiter	When accelerator pedal is full depressed	On
		Other than above	Off

TERMINAL LAYOUT

PHYSICAL VALUES



Terminal No. (Wire color)		Description		Condition		Standard value	Reference value
+	–	Signal name	Input/ Output				
1 (L)	—	CAN -H	—	—		—	—
2 (R)		CAN -L	—	—		—	—
5 (B)	Ground	Ground	—	Ignition switch ON		0 - 0.1 V	Approx. 0 V
6 (L)	—	ITS communication-H	—	—		—	—
7 (Y)		ITS communication-L	—	—		—	—
8 (L)		Chassis communication-H	—	—		—	—
9 (R)		Chassis communication-L	—	—		—	—
12 (GR)[*1] (G)[*2]	5 (B)	Ignition power supply	Input	Ignition switch ON	—	10 - 16 V	Battery voltage
17 (V)		ICC brake hold relay drive signal	Output	Ignition switch ON	—	10 - 16 V	Approx. 12 V
					At “STOP LAMP” test of “Active test”	0 - 0.1 V	Approx. 0 V
23 (Y)		ICC/ASCD steering switch signal ground	—	Ignition switch ON		0 - 0.1 V	Approx. 0 V
24[*3] (SB)	23[*3] (Y)	ICC steering switch signal	Input	Ignition switch ON	ICC steering switch: OFF	4.1 - 4.3 V	Approx. 4.3 V
					CANCEL switch: Pressed	1.1 - 1.6	Approx. 1.3 V
					RESUME/ACCELERATE switch: Pressed	3.5 - 3.7 V	Approx. 3.7 V
					SET/COAST switch: Pressed	2.8 - 3.1 V	Approx. 3.0 V
					DISTANCE switch: Pressed	2.0 - 2.4 V	Approx. 2.2 V
24[*4] (SB)	23[*4] (Y)	ASCD steering switch signal	Input	Ignition switch ON	ASCD steering switch: OFF	3.8 - 4.3 V	Approx. 4.0 V
					CANCEL switch: Pressed	0.8 - 1.3 V	Approx. 1.0 V
					SET/COAST switch: Pressed	1.8 - 2.2 V	Approx. 2.0 V
					RESUME/ACCELERATE switch: Pressed	2.8 - 3.1 V	Approx. 3.0 V

NOTE:
*1: VR30DDTT
*2: 2.0 TURBO GASOLINE ENGINE
*3: Used only in with ICC.
*4: Used only in without ICC.

Fail-safe (ADAS Control Unit)

INFOID:0000000013399009

If a malfunction occurs in each system, ADAS control unit cancels each control, sounds a beep, and turns ON the warning or indicator lamp.

System	Buzzer	Warning lamp/Warning display	Description
Vehicle-to-vehicle distance control mode	High-pitched tone	ICC system warning	Cancel
Conventional (fixed speed) cruise control mode	High-pitched tone	ICC system warning	Cancel
Forward Emergency Braking (FEB)	High-pitched tone	• FEB warning lamp • Warning systems indicator (Forward position: Yellow)	Cancel
Predictive Forward Collision Warning (PFCW)	High-pitched tone	Warning systems indicator (Forward position: Yellow)	Cancel
Distance Control Assist (DCA)	High-pitched tone	Warning systems indicator (Forward position: Yellow)	Cancel
Lane Departure Warning (LDW)	—	Warning systems indicator (Lane position: Yellow)	Cancel
Lane Departure Prevention (LDP)	Low-pitched tone	Warning systems indicator (Lane position: Yellow)	Cancel
Blind Spot Warning (BSW)	—	Warning systems indicator (Blind spot position: Yellow)	Cancel
Blind Spot Intervention	Low-pitched tone	Warning systems indicator (Blind spot position: Yellow)	Cancel
Back-up Collision Intervention (BCI)	High-pitched tone	BCI system warning	Cancel

DTC Inspection Priority Chart

INFOID:0000000013399010

If multiple DTCs are detected simultaneously, check them one by one depending on the following DTC inspection priority chart.

Priority	Detected items (DTC)
1	• U1507: LOST COMM (SIDE RDR R) • U1508: LOST COMM (SIDE RDR L)
2	• 1CA0A: CONFIG UNFINISHED • U1000: CAN COMM CIRCUIT • U1010: CONTROL UNIT (CAN)
3	• C1B00: CAMERA UNIT MALF • C1F02: APA C/U MALF • C1B53: SIDE RDR R MALF • C1B54: SIDE RDR L MALF • C1B84: DIST SEN MALFUNCTION

Priority	Detected items (DTC)	
4	• C1A01: POWER SUPPLY CIR • C1A02: POWER SUPPLY CIR 2 • C1A04: ABS/TCS/VDC CIRC • C1A05: BRAKE SW/STOP L SW • C1A06: OPERATION SW CIRC • C1A13: STOP LAMP RLY FIX • C1A14: ECM CIRCUIT • C1A24: NP RANGE • C1A26: ECD MODE MALF • C1A27: ECD PWR SUPLY CIR • C1A33: CAN TRANSMISSION ERR • C1A34: COMMAND ERROR • C1A35: APA CIR • C1A36: APA CAN COMM CIR • C1A37: APA CAN CIR 2 • C1A38: APA CAN CIR 1 • C1A39: STRG SEN CIR • C1B01: CAM AIMING INCMP • C1B03: CAM ABNRML TMP DETCT • C1B5D: FEB OPE COUNT LIMIT • C1B56: SONAR CIRCUIT • C1B57: AVM CIRCUIT • C1B59: CCM CIRCUIT • C1B82: DIST SEN OFF-CENTER • C1B85: DIST SEN ABNORMAL TEMP • C1B86: DIST SEN PWR SUP CIR • C1F01: APA MOTOR MALF • C1F05: APA PWR SUPLY CIR	• U0121: VDC CAN CIR 2 • U0126: STRG SEN CAN CIR 1 • U0235: ICC SENSOR CAN CIRC 1 • U0401: ECM CAN CIR 1 • U0402: TCM CAN CIR 1 • U0415: VDC CAN CIR 1 • U0424: HVAC CAN CIR 1 • U0428: STRG SEN CAN CIR 2 • U1500: CAM CAN CIR 2 • U1501: CAM CAN CIR 1 • U1502: ICC SEN CAN COMM CIR • U1503: SIDE RDR L CAN CIR 2 • U1504: SIDE RDR L CAN CIR 1 • U1505: SIDE RDR R CAN CIR 2 • U1506: SIDE RDR R CAN CIR 1 • U150B: ECM CAN CIRC 3 • U150C: VDC CAN CIRC 3 • U150D: TCM CAN CIRC 3 • U150E: BCM CAN CIRC 3 • U150F: AV CAN CIRC 3 • U1512: HVAC CAN CIRC3 • U1513: METER CAN CIRC 3 • U1514: STRG SEN CAN CIRC 3 • U1515: ICC SENSOR CAN CIRC 3 • U1516: CAM CAN CIRC 3 • U1517: APA CAN CIRC 3 • U1518: SIDE RDR L CAN CIRC 3 • U1519: SIDE RDR R CAN CIRC 3 • U1521: SONAR CAN COMMUNICATION 2 • U1522: SONAR CAN COMMUNICATION 1 • U1523: SONAR CAN COMMUNICATION 3 • U1524: AVM CAN COMMUNICATION 1 • U1525: AVM CAN COMMUNICATION 3 • U1527: CCM CAN CIR 1 • U153F: CCM CAN CIR 2 • U1530: DR ASSIST BUZZER CAN CIR 1 • U1538: EMCM CAN CIRCUIT 3 • U1540: DAST 3 CAN CIR 1 • U1541: DAST 3 CAN CIR 2
5	• C1A03: VHCL SPEED SE CIRC	
6	• C1A15: GEAR POSITION	
7	• C1A00: CONTROL UNIT	

DTC Index

INFOID:0000000013399011

Systems for fail-safe
- A: Vehicle-to-vehicle distance control mode
- B: Conventional (fixed speed) cruise control mode
- C: Distance Control Assist (DCA)
- D: Forward Emergency Braking (FEB)
- E: Predictive Forward Collision Warning (PFCW)
- F: Blind Spot Warning (BSW)/Blind Spot Intervention (Without Active Lane control)
- G: Back-up Collision Intervention (BCI)
- H: Lane Departure Warning (LDW)/Lane Departure Prevention (LDP)
- I: Automatic Speed COntrol Device (ASCD) (Without ICC)

DTC		CONSULT display	Fail-safe	Reference
CONSULT	On board display		System	
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	55	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	—	—
C1A0A	41	CONFIG UNFINISHED	A, B, C, D, E, F, G, H, I	DAS-103
C1A00	0	CONTROL UNIT	A, B, C, D, E, F, G, H, I	DAS-104
C1A01	1	POWER SUPPLY CIR	A, B, C, D, E, F, G, H, I	DAS-105
C1A02	2	POWER SUPPLY CIR 2	A, B, C, D, E, F, G, H, I	DAS-105
C1A03	3	VHCL SPEED SE CIRC	A, B, C, D, E, F, G, H, I	DAS-106
C1A04	4	ABS/TCS/VDC CIRC	A, B, C, D, E, F, G, H, I	DAS-108
C1A05	5	BRAKE SW/STOP L SW	A, B, C, D, G, H	DAS-109
C1A06	6	OPERATION SW CIRC	A, B, C, D, E, H, I	DAS-117
C1A13	13	STOP LAMP RLY FIX	A, B, C, D, E, G	DAS-121
C1A14	14	ECM CIRCUIT	A, B, C, D, E, I	DAS-132
C1A15	15	GEAR POSITION	A, B, C, D, E, I	DAS-134
C1A24	24	NP RANGE	A, B, C, D, E, F, G	DAS-136
C1A26	26	ECD MODE MALF	A, B, C, D, G	DAS-138
C1A27	27	ECD PWR SUPLY CIR	A, B, C, D, G	DAS-140
C1A33	33	CAN TRANSMISSION ERR	A, B, C, D, E, I	DAS-142
C1A34	34	COMMAND ERROR	A, B, C, D, E, I	DAS-143
C1A35	35	APA CIR	A, C, D, E	DAS-144
C1A36	36	APA CAN COMM CIR	A, C, D, E	DAS-145
C1A37	133	APA CAN CIR 2	A, C, D, E	DAS-146
C1A38	132	APA CAN CIR 1	A, C, D, E	DAS-147
C1A39	39	STRG SEN CIR	A, B, C, D, E, F, G	DAS-148
C1B00	81	CAMERA UNIT MALF	F, H	DAS-149
C1B01	82	CAM AIMING INCMP	F, H	DAS-150
C1B03	83	CAN ABNRML TMP DETCT	F, H	DAS-151
C1B5D	198	FEB OPE COUNT LIMIT	C, D, E	DAS-152
C1B53	84	SIDE RDR R MALF	F, G	DAS-153
C1B54	85	SIDE RDR L MALF	F, G	DAS-154
C1B56	86	SONAR CIRCUIT	G	DAS-155
C1B57	87	AVM CIRCUIT	G	DAS-156
C1B59	184	CCM CIRCUIT	A, B, C, F, G	DAS-157

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DTC		CONSULT display	Fail-safe	Reference
CONSULT	On board display		System	
C1B82	12	DIST SEN OFF-CENTER	A, C, D, E	DAS-158
C1B84	17	DIST SEN MALFUNCTION	A, C, D, E	DAS-159
C1B85	21	DIST SEN ABNORMAL TEMP	A, C, D, E	DAS-160
C1B86	80	DIST SEN PWR SUP CIR	A, C, D, E	DAS-161
C1F01	91	APA MOTOR MALF	A, C, D, E	DAS-163
C1F02	92	APA C/U MALF	A, C, D, E	DAS-164
C1F05	95	APA PWR SUPLY CIR	A, C, D, E	DAS-165
U0121	127	VDC CAN CIR 2	A, B, C, D, E, F, G, H, I	DAS-166
U0126	130	STRG SEN CAN CIR 1	A, B, C, D, E, F, G	DAS-167
U0235	144	ICC SENSOR CAN CIRC 1	A, C, D, E	DAS-168
U0401	120	ECM CAN CIR 1	A, B, C, D, E, F, G, I	DAS-169
U0402	122	TCM CAN CIR 1	A, B, C, D, E, F, G, H	DAS-171
U0415	126	VDC CAN CIR 1	A, B, C, D, E, F, G, H, I	DAS-172
U0424	156	HVAC CAN CIR 1		DAS-173
U0428	131	STRG SEN CAN CIR 2	A, B, C, D, E, F, G	DAS-174
U1000[NOTE]	100	CAN COMM CIRCUIT	A, B, C, D, E, F, G, H, I	DAS-175
U1010	110	CONTROL UNIT (CAN)	A, B, C, D, E, F, G, H, I	DAS-177
U150B	157	ECM CAN CIRC 3	A, B, C, D, E, F, G, H, I	DAS-178
U150C	158	VDC CAN CIRC 3	A, B, C, D, E, F, G, H, I	DAS-180
U150D	159	TCM CAN CIRC 3	A, B, C, D, E, F, G, H	DAS-181
U150E	160	BCM CAN CIRC 3	A, B, C, D, F, G, H	DAS-182
U150F	161	AV CAN CIRC 3		DAS-183
U1500	145	CAM CAN CIR2	F, H	DAS-184
U1501	146	CAM CAN CIR 1	F, H	DAS-185
U1502	147	ICC SEN CAN COMM CIR	A, C, D, E	DAS-186
U1503	150	SIDE RDR L CAN CIR 2	F, G	DAS-187
U1504	151	SIDE RDR L CAN CIR 1	F, G	DAS-188
U1505	152	SIDE RDR R CAN CIR 2	F, G	DAS-189
U1506	153	SIDE RDR R CAN CIR 1	F, G	DAS-190
U1507	154	LOST COMM (SIDE RDR R)	F, G	DAS-191
U1508	155	LOST COMM (SIDE RDR L)	F, G	DAS-192
U1512	162	HVAC CAN CIRC3		DAS-193
U1513	163	METER CAN CIRC 3	A, B, C, D, E, F, G, H, I	DAS-194
U1514	164	STRG SEN CAN CIRC 3	A, B, C, D, E, F, G	DAS-195
U1515	165	ICC SENSOR CAN CIRC 3	A, C, D, E	DAS-196

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DTC		CONSULT display	Fail-safe	Reference
CONSULT	On board display		System	
U1516	166	CAM CAN CIRC 3	F, G, H	DAS-197
U1517	167	APA CAN CIRC 3	A, C, D, E	DAS-198
U1518	168	SIDE RDR L CAN CIRC 3	F, G	DAS-199
U1519	169	SIDE RDR R CAN CIRC 3	F, G	DAS-200
U1521	177	SONAR CAN COMMUNICATION 2	G	DAS-201
U1522	178	SONAR CAN COMMUNICATION 1	G	DAS-202
U1523	179	SONAR CAN COMMUNICATION 3	G	DAS-203
U1524	180	AVM CAN COMMUNICATION 1	G	DAS-204
U1525	181	AVM CAN COMMUNICATION 3	G	DAS-205
U1527	185	CCM CAN CIR1	A, B, C, F, G	DAS-206
U153F	186	CCM CAN CIR2	A, B, C, F, G	DAS-207
U1530	183	DR ASSIST BUZZER CAN CIR1		DAS-208
U1538	197	EMCM CAN CIRCUIT 3	A, B, C, D, E, F, G, H, I	DAS-209
U1540	200	DAST CAN CIR 1	C, D, E	DAS-211
U1541	201	DAST CAN CIR 2	C, D, E	DAS-212

NOTE:
With the detection of “U1000” some systems do not perform the fail-safe operation.
A system controlling based on a signal received from the control unit performs fail-safe operation when the communication with the ADAS control unit becomes inoperable.

DTC/CIRCUIT DIAGNOSIS

FORWARD EMERGENCY BRAKING

Diagnosis Procedure

INFOID:0000000012793855

1.FORWARD EMERGENCY BRAKING DIAGNOSIS

- The system will be cancelled automatically with a beep sound and FEB warning lamp on the combination meter will illuminate, when the system will not operate properly.
- When the FEB warning lamp continues to illuminate even if the FEB system is turned on after the engine restarts, perform the trouble-diagnosis.

>> Go to ICC. Refer to CCS-111, "Work Flow".

SYMPTOM DIAGNOSIS

SYSTEM SETTINGS CANNOT BE TURNED ON/OFF ON THE INTEGRAL SWITCH

Symptom Table

INFOID:0000000012793856

CAUTION:
Perform the self-diagnosis with CONSULT before the symptom diagnosis. Perform the trouble diagnosis if any DTC is detected.

Symptom		Inspection item/Reference page
FEB system does not turn ON/OFF	FEB warning lamp is not turned ON⇔OFF when operating integral switch	BRC-228, "Diagnosis Procedure"

Description

INFOID:0000000012793857

FEB system does not turn ON/OFF.
- FEB warning lamp does not illuminate even if the integral switch is operated when FEB warning lamp is not illuminated.
- FEB warning lamp does not turn off even if the integral switch is operated when FEB warning lamp is illuminated.

NOTE:
The system ON/OFF condition will be memorized even if the ignition switch turns OFF.

Diagnosis Procedure

INFOID:0000000012793858

1.PERFORM THE SELF-DIAGNOSIS

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected in self-diagnosis results for “ICC/ADAS” with CONSULT. Refer to BRC-224, "DTC Index".

Is any DTC detected?

YES >> GO TO 6.
NO >> GO TO 2.

2.INTEGRAL SWITCH INSPECTION

1. Start the engine.
2. Check that “FEB SELECT” operates normally in “DATA MONITOR” for “ICC/ADAS” with CONSULT.

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 3.

3.PERFORM SELF-DIAGNOSIS OF DISPLAY CONTROL UNIT

Check if any DTC is detected in “Self Diagnostic Result” of “MULTI AV”. Refer to AV-107, "DTC Index".

Is any DTC detected?

YES >> Repair or replace the malfunctioning parts identified by the self-diagnosis result.
NO >> Replace the ADAS control unit. Refer to DAS-214, "Removal and Installation".

4.FEB WARNING LAMP

1. Start the engine.
2. Select the active test item “METER LAMP” for “ICC/ADAS” with CONSULT.
3. Check if the FEB warning lamp illuminates when the test item is operated.

Is the inspection result normal?

YES >> Refer to CCS-111, "Work Flow".
NO >> GO TO 5.

5.CHECK DATA MONITOR OF COMBINATION METER

Check that “BA W/L” operates normally in “DATA MONITOR” for “METER/M&A” with CONSULT, when the FEB setting ON by integral switch.

Is the inspection result normal?

YES >> Replace the combination meter. Refer to MWI-141, "Removal and Installation".
NO >> Replace the ADAS control unit. Refer to DAS-214, "Removal and Installation".

6. REPAIR OR REPLACE MALFUNCTIONING PARTS

Repair or replace malfunctioning parts.

>> GO TO 7.

7. CHECK FEB SYSTEM

Check that FEB warning lamp turned ON⇔OFF, when operating integral switch.

>> INSPECTION END