SECTION BRAKE CONTROL SYSTEM

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< PRECAUTION > PRECAUTION PRECAUTIONS

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

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

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

Precaution for Brake System

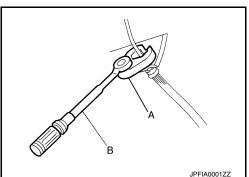
WARNING:

Clean any dust from the front brake and rear brake using a vacuum dust collector. Do not blow by compressed air.

- Brake fluid use refer to <u>MA-15, "FOR USA AND CANADA : Fluids and Lubricants"</u> (United States and Canada) or <u>MA-17, "FOR MEXICO : Fluids and Lubricants"</u> (Mexico).
- Do not reuse drained brake fluid.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Do not use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.

BRC-7

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



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PRECAUTIONS

< PRECAUTION >

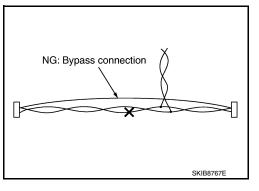
Precaution for Brake Control System

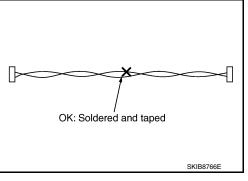
- Just after starting vehicle after ignition switch is ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level and oil leaks.
- If tire size and type are used in an improper combination or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or SLIP indicator lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspensionrelated parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).
- When driving with worn or deteriorated suspension, tires and brake-related parts.

Precaution for Harness Repair

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

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





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< PREPARATION >

PREPARATION PREPARATION

Special Service Tool

INFOID:000000011644889

[TYPE 1]

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

Tool number (TechMate No.) Tool name		Description	С
KV991J0080		Checking operation of ABS active wheel sen-	
(J-45741)	Ma BARAN -	sors	D
ABS active wheel sensor tester	Vian when we had to be we had t		E
			BRC

Commercial Service Tools

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

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APPLICATION NOTICE

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION APPLICATION NOTICE

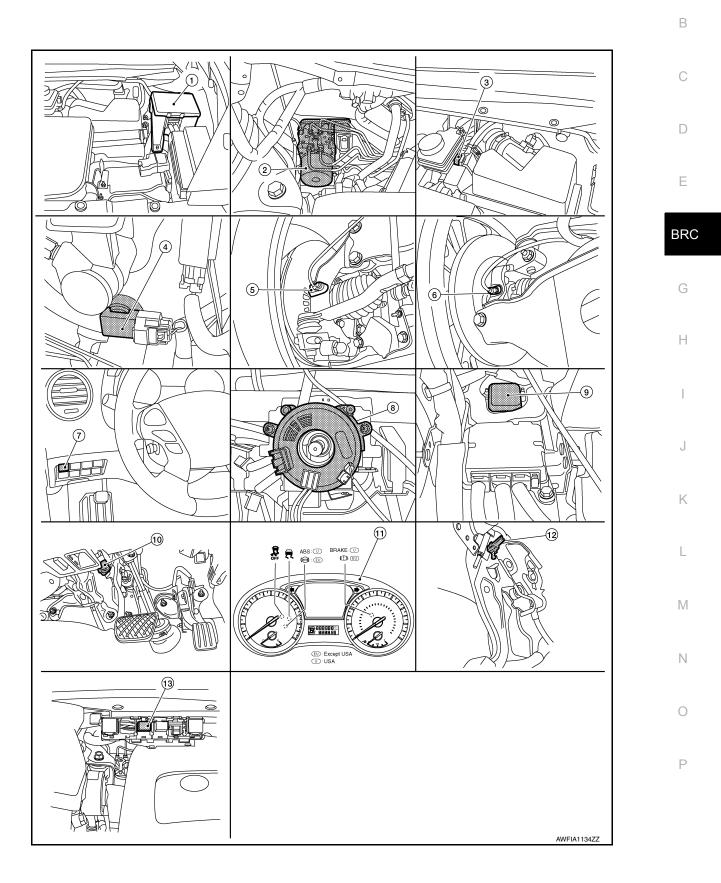
Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS

COMPONENT PARTS

Component Parts Location

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

1.	IPDM E/R	2.	ABS actuator and electric unit (con- trol unit)	3.	Brake fluid level switch (part of brake fluid reservoir)
4.	Vacuum sensor (attached to lower side of brake booster)	5.	Front wheel sensor LH (RH similar)	6.	Rear wheel sensor LH (RH similar)
7.	VDC OFF switch	8.	Steering angle sensor (view with steering wheel and steering column covers removed)	9.	Yaw rate/side/decel G sensor (view with the center console removed)
10.	Stop lamp switch	11.	Combination meter	12.	Parking brake switch

13. Stop lamp relay

Component Description

INFOID:000000011644892

Component		Reference/Function	
	Pump/motor		
ABS actuator and electric unit (control unit)	Motor relay		
	Actuator relay (main relay)		
	ABS IN valve	DDC 12 "ADC Actuator and Electric Lipit (Control Lipit)"	
	ABS OUT valve	BRC-12, "ABS Actuator and Electric Unit (Control Unit)"	
	Cut valve 1		
	Cut valve 2		
	Pressure sensor		
Wheel sensor		BRC-13. "Wheel Sensor and Sensor Rotor"	
Stop lamp switch		BRC-13, "Stop Lamp Switch"	
Steering angle sensor		BRC-13. "Steering Angle Sensor"	
Yaw rate/side/decel G sensor		BRC-13. "Yaw Rate/Side/Decel G Sensor"	
Vacuum sensor		BRC-14, "Vacuum Sensor"	
Brake fluid level switch		BRC-14, "Brake Fluid Level Switch"	
Parking brake switch		BRC-14. "Parking Brake Switch"	
VDC OFF switch		BRC-14. "VDC OFF Switch"	
ECM		 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal 	
ТСМ		 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Shift position signal Current gear position signal 	
ABS warning lamp			
Brake warning lamp		BRC-15, "System Description"	
VDC OFF indicator lamp			
SLIP indicator lamp		-	

ABS Actuator and Electric Unit (Control Unit)

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

ELECTRIC UNIT (CONTROL UNIT)

• Brake fluid pressure, engine and transmission are controlled according to signals from each sensor.

· If malfunction is detected, the system enters fail-safe mode.

BRC-12

COMPONENT PARTS

< SYSTEM DESCRIPTION >	[TYPE 1]
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)	I.
Actuator Relay Operates each valve ON/OFF according to signals from ABS actuator and electric unit (control uni	t).
ABS IN Valve and ABS OUT Valve Increases, holds or decreases the fluid pressure of each caliper according to signals from ABS a electric unit (control unit).	ctuator and
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 and hill function are activated.	start assist
Wheel Sensor and Sensor Rotor	OID:0000000011644894
 NOTE: Wheel sensor and sensor rotor is integrated in wheel hub assembly. Never measure resistance and voltage value using a tester because sensor is active sensor. 	
 Downsize and weight reduction is aimed. IC for detection portion and magnet for sensor rotor are adopted. Power supply is supplied to detection portion so that magnetic field 	
 Ine 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	r circuit
of magnetic field is proportional to wheel speed.	\succ
	JPFIC0131GB

Stop Lamp Switch

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

Steering Angle Sensor

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

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

Yaw Rate/Side/Decel G Sensor

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

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

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

Brake Fluid Level Switch

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

Vacuum Sensor

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

Parking Brake Switch

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

VDC OFF Switch

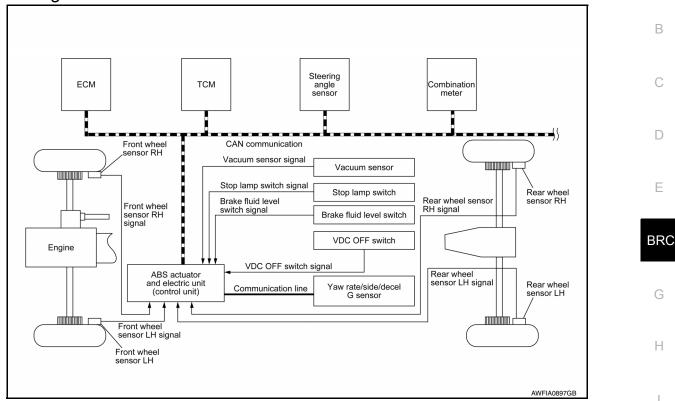
- This is an integrated switch with switches for other functions.
- Non-operational status or standby status of the following functions can be selected using VDC OFF switch. VDC OFF indicator lamp indicates the operation status of function. (ON: Non-operational status, OFF: Standby status)
- VDC function
- NOTE:
- Brake limited slip differential (BLSD) control operates.
- TCS function
- VDC OFF indicator lamp turns OFF (standby status) when the engine is started again after it is stopped once while VDC OFF indicator lamp is ON (non-operational status).

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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 and hill start assist function.
- Fail-safe function is available for each function and is activated by each function when system malfunction K occurs.

INPUT SIGNAL AND OUTPUT SIGNAL

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

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

VDC function, TCS function, ABS function and EBD function

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[TYPE 1]	
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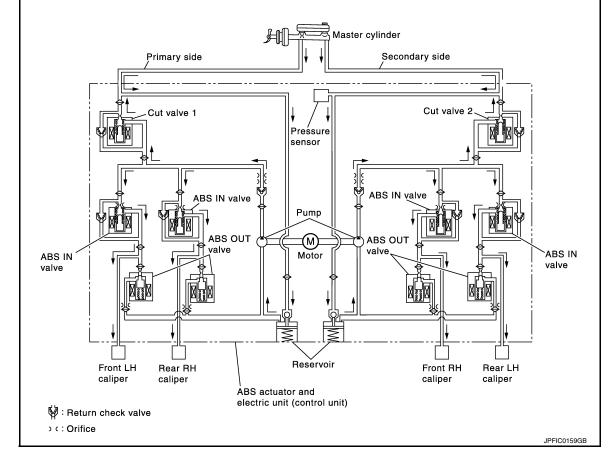
Component	Signal description
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.Steering angle sensor signal
Combination meter	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Brake fluid level switch signal 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 warning lamp signal VDC OFF indicator lamp

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

VALVE OPERATION (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

< SYSTEM DESCRIPTION >

 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.

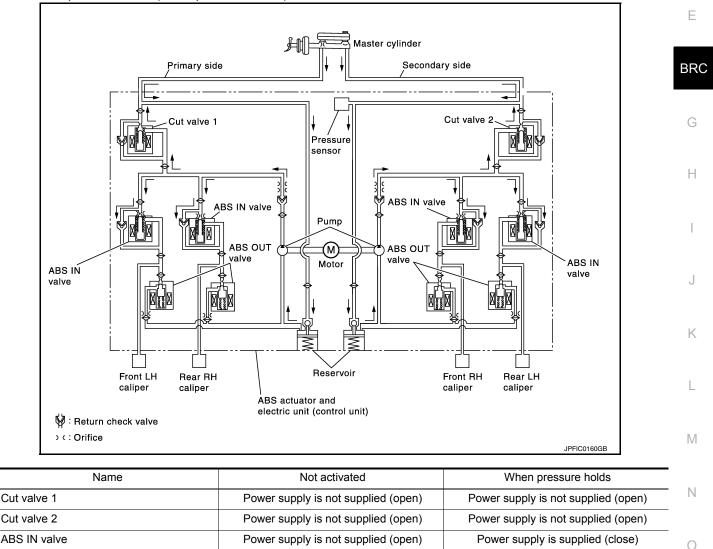
When rear RH wheel caliper pressure increases

 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)



Р

When front RH wheel caliper pressure holds

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

Power supply is not supplied (close)

When front LH wheel caliper pressure holds

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

ABS OUT valve

Each caliper (fluid pressure)

Power supply is not supplied (close)

Pressure holds

[TYPE 1]

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< SYSTEM DESCRIPTION >

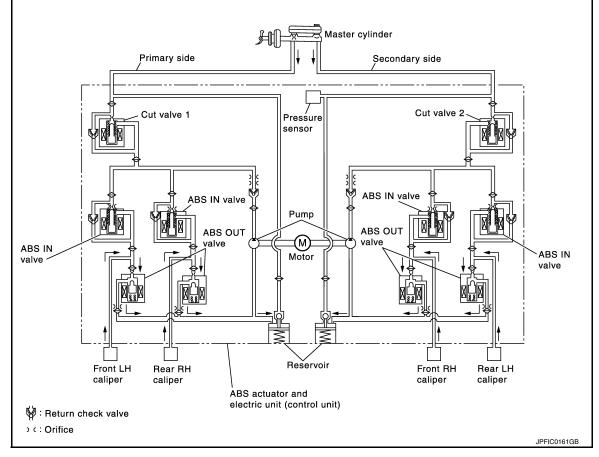
When rear RH wheel caliper pressure holds

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

When rear LH wheel caliper pressure holds

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

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

< SYSTEM DESCRIPTION >

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.	

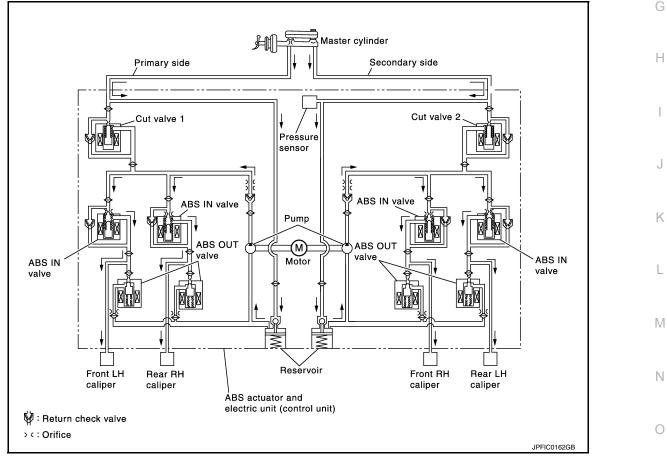
VALVE OPERATION (OTHER THAN ABS AND EBD)

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



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[TYPE 1]

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 sup- plied (open) Only wheel that the pressure is to be in- creased: 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 sup- plied (open) Only wheel that the pressure is to be in- creased: Power supply is supplied (close)	
ABS IN valve	Power supply is not supplied (open)	Only wheel that the pressure is to be in- creased: Power supply is not supplied (open) Wheel other than the one that the pressure is to be increased: Power supply is supplied (close)	
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)	
Each caliper (fluid pressure)	_	Pressure increases	

When front RH wheel caliper pressure increases

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

When front LH wheel caliper pressure increases

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

When rear RH wheel caliper pressure increases

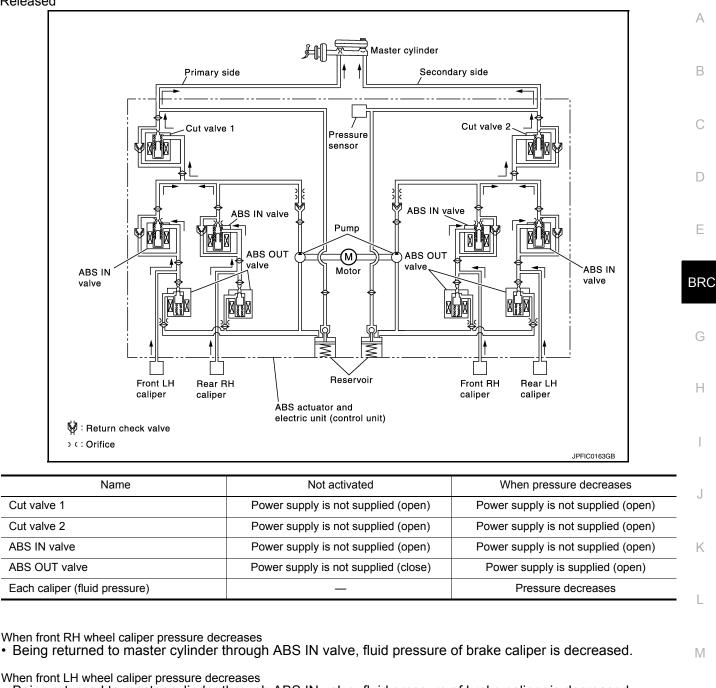
 Motor is activated. Brake fluid from pump is supplied to front RH wheel caliper through ABS IN valve. For other wheel, ABS IN valve is closed and brakes fluid is not supplied to caliper.

When rear LH wheel caliper pressure increases

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

< SYSTEM DESCRIPTION >

Released



• 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 decreas- es 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.	

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[TYPE 1]

< SYSTEM DESCRIPTION >

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

CONDITIONS FOR TURNING ON THE WARNING LAMP

ABS Warning Lamp

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

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

Brake Warning Lamp

 Turns ON at the same time as ABS warning lamp and VDC warning lamp when EBD function is malfunctioning.

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

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

VDC Warning Lamp

• Turns ON when either VDC function, TCS function, ABS function or EBD function is malfunctioning.

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

Condition (status)	VDC warning lamp
Ignition switch OFF	OFF
For approx. 1 second after the ignition switch is turned ON	ON
Approx. 1 second after ignition switch is turned ON (when the system is in normal operation)	OFF
VDC function is malfunctioning	ON
TCS function is malfunctioning	ON

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Condition (status)	VDC warning lamp	
ABS function is malfunctioning	ON	A
EBD function is malfunctioning	ON	
VDC function is operating	Blinking	В
TCS function is operating	Blinking	

CONDITIONS FOR TURNING 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 second after the ignition switch is turned ON	ON	
Approx. 1 second after ignition switch is turned ON (when the system is in normal operation)	OFF	BRC
When VDC OFF switch is ON (VDC function and TCS function are OFF)	ON	G

Fail-Safe

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VDC FUNCTION, TCS FUNCTION and hill start assist FUNCTION

VDC warning lamp in combination meter turns ON when a malfunction occurs in system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist 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 J [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function, ABS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and hill start assist function. However, EBD function is operated normally. **NOTE:**

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

EBD FUNCTION

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

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< SYSTEM DESCRIPTION >

DTC	Malfunction detected condition	Fail-safe condition	
C1101	When an open circuit is detected in rear RH wheel sensor circuit.	 The following functions are suspended: VDC function TCS function ABS function EBD function (only when both 2 rear wheels are malfunctioning hill start assist function 	
C1102	When an open circuit is detected in rear LH wheel sensor circuit.		
C1103	When an open circuit is detected in front RH wheel sensor circuit.		
C1104	When an open circuit is detected in front LH wheel sensor circuit.		
C1105	 When power supply voltage of rear RH wheel sensor is low. When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. 		
C1106	 When power supply voltage of rear LH wheel sensor is low. When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. 		
C1107	 When power supply voltage of front RH wheel sensor is low. When distance between front RH wheel sensor and front RH wheel sensor rotor is large. When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. 		
C1108	 When power supply voltage of front LH wheel sensor is low. When distance between front LH wheel sensor and front LH wheel sensor rotor is large. When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. 		
C1109	When ignition voltage is 10 V or less.When ignition voltage is 16 V or more.	 The following functions are suspended: VDC function TCS function ABS function EBD function hill start assist function 	
C1111	When a malfunction is detected in motor or motor relay.		
C1115	When difference in wheel speed between any wheel and others is detected during the vehicle is driven, because of installation of other tires than specified.	The following functions are sus- pended: • VDC function • TCS function • ABS function • hill start assist function	
C1116	When stop lamp switch signal is not input when brake pedal operates.		
C1120	When a malfunction is detected in front LH ABS IN valve.		
C1121	When a malfunction is detected in front LH ABS OUT valve.	The following functions are sus-	
C1122	When a malfunction is detected in front RH ABS IN valve.	pended:	
C1123	When a malfunction is detected in front RH ABS OUT valve.	 VDC function TCS function 	
C1124	When a malfunction is detected in rear LH ABS IN valve.	ABS function	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	EBD function hill start assist function	
C1126	When a malfunction is detected in rear RH ABS IN valve.		
C1127	When a malfunction is detected in rear RH ABS OUT valve.		
C1130	When a malfunction is detected in ECM system.	The following functions are sus- pended: • VDC function • TCS function • hill start assist function	

< SYSTEM DESCRIPTION >

[TYPE 1]

DTC	Malfunction detected condition	Fail-safe condition	
C1140	When a malfunction is detected in actuator relay.	The following functions are sus- pended: • VDC function • TCS function • ABS function • EBD function • hill start assist function	
C1142	When a malfunction is detected in pressure sensor.	The following functions are sus-	
C1143	When a malfunction is detected in steering angle sensor.	pended:VDC function	
C1144	When neutral position adjustment of steering angle sensor is not complete.	TCS function	
C1145	When a malfunction is detected in yaw rate signal.	 hill start assist function 	
C1146	When a malfunction is detected in side/decel G signal.	The following functions are sus-	
C1155	When brake fluid level low signal is detected.	 pended: VDC function TCS function ABS function hill start assist function 	
C1160	When calibration of yaw rate/side/decel G sensor is not complete.	 The following functions are suspended: VDC function TCS function hill start assist function 	
C1164	When a malfunction is detected in cut valve 1.	The following functions are sus-	
C1165	When a malfunction is detected in cut valve 2.	pended:VDC function	
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	 TCS function ABS function EBD function hill start assist function 	
C1197	When a malfunction is detected in vacuum sensor.		
C1198	 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. 	Electrical vacuum assistance of brake booster is suspended.	
C1199	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.	_	
C119A	When a malfunction is detected in supply power voltage of vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.	
U1000	When CAN communication signal is not continuously received for 2 seconds or more.	The following functions are sus- pended: • VDC function • TCS function • hill start assist function	

VDC FUNCTION

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[TYPE 1]

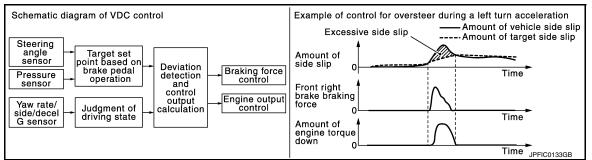
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VDC FUNCTION : System Diagram

		CAN communication
VDC OFF switch VDC OFF switch signal Vacuum sensor Vacuum sensor signal		
Stop lamp Stop lamp Stop lamp switch signal Stop lamp relay		
Front wheel sensor RH	ABS actuator and electric unit (control unit)	
Rear wheel sensor RH		Combination meter
Yaw rate/side/decel G sensor		Steering angle sensor
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VDC FUNCTION : System Description

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



- VDC function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as
 engine output control by transmitting drive signal to actuator portion according to difference between target
 side slip amount and vehicle side slip amount
- VDC warning lamp blinks while VDC function is in operation and indicates to the driver that the function is in operation.
- VDC function has brake limited slip differential (BLSD) function. LH and RH driving wheel spin is always monitored. If necessary, appropriate brake force is independently applied to LH or RH driving wheel so that one-sided wheel spin is avoided and traction is maintained. Mainly starting ability is improved. [Brake limited slip differential (BLSD) function operates while VDC function is in non-operational status (OFF) by VDC OFF

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switch.] VDC warning lamp turns ON when Brake limited slip differential (BLSD) function is in operation. Noises and vibration may be generated due to brake operation. This is not a malfunction.

- CONSULT can be used to diagnose the system.
- Fail-safe function is adopted. When a malfunction occurs in VDC function, the control is suspended for VDC function, TCS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-23</u>, "Fail-Safe".

NOTE:

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

INPUT SIGNAL AND OUTPUT SIGNAL

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

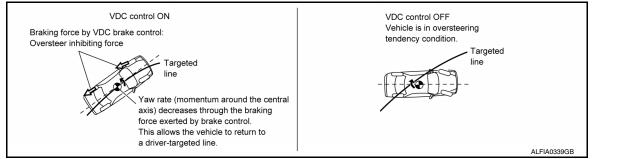
Component	Signal description
Yaw rate/side/decel G sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*¹: Yaw rate signal Side G sensor signal Decel G sensor signal
ECM	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Acceleration pedal position signal Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: Target throttle position signal
ГСМ	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication:Shift position signal
Steering angle sensor	 Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: Steering angle sensor signal
Combination meter	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Brake fluid level switch signal 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

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

OPERATION CHARACTERISTICS

VDC Function That Prevents Oversteer Tendency

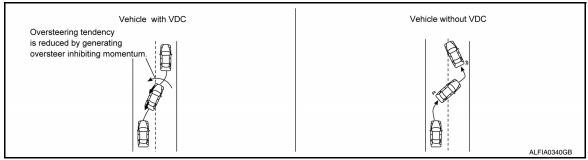
• During a cornering, brake force (brake fluid pressure) is applied on front wheel and rear wheel on the outer side of turn. Momentum directing towards the outer side of turn is generated. Oversteer is prevented.



< SYSTEM DESCRIPTION >

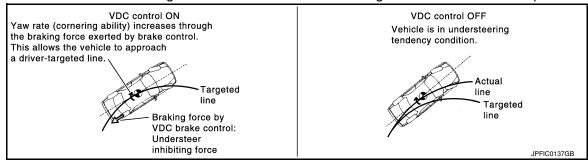
[TYPE 1]

 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.

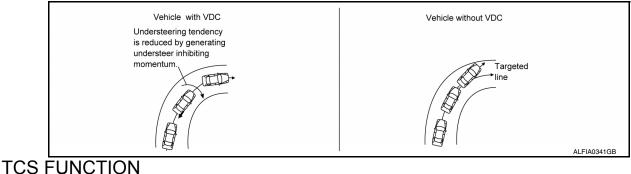


VDC Function That Prevents Understeer Tendency

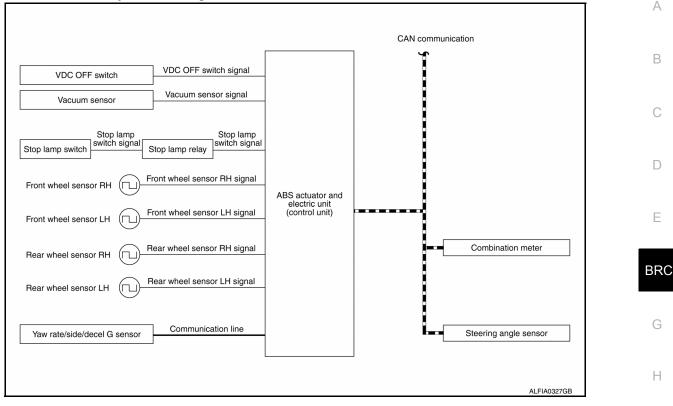
During a cornering, brake force (brake fluid pressure) is applied on front wheel and rear wheel on the inner side of turn. Momentum directing towards the inner side of turn is generated. Understeer is prevented.



• Applying braking during 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 : System Diagram



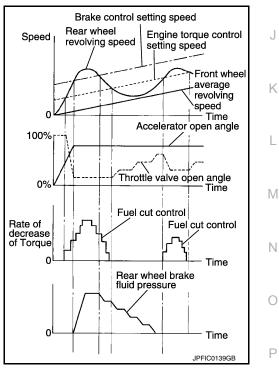
TCS FUNCTION : System Description

- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Engine output and transmission shift status is controlled so that slip rate of drive wheels is at an 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.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for VDC function, TCS function, and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-23</u>, "Fail-Safe".

INPUT SIGNAL AND OUTPUT SIGNAL

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

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< SYSTEM DESCRIPTION >

[TYPE	1]
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Component	Signal description	
Yaw rate/side/decel G sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*¹: Yaw rate signal Side G sensor signal Decel G sensor signal 	
ECM	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Accelerator pedal position signal Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: Target throttle position signal 	
ТСМ	 Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: Shift position signal 	
Steering angle sensor	 Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: Steering angle sensor signal 	
Combination meter	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Brake fluid level switch signal 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 	

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

ABS FUNCTION : System Diagram

Stop lamp Stop lamp op lamp switch signal Stop lamp relay	-	CAN communication
Vacuum sensor Vacuum sensor signal ront wheel sensor RH Front wheel sensor RH signal ront wheel sensor LH Front wheel sensor LH signal	ABS actuator and electric unit (control unit)	Combination meter
Rear wheel sensor RH	-	

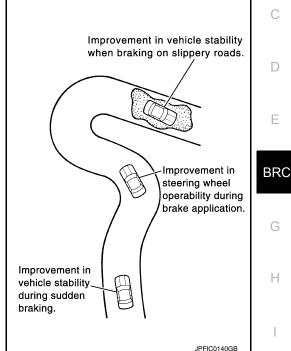
< SYSTEM DESCRIPTION >

ABS FUNCTION : System Description

- By preventing wheel lock through brake force (brake fluid pressure) control that is electronically controlled by detecting wheel speed during braking, stability during emergency braking is improved so that obstacles can be avoided by steering operation.
- During braking, control unit 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 and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and hill start assist function. However, EBD function is operated normally. Refer to BRC-23, "Fail-Safe".

NOTE:

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



INPUT SIGNAL AND OUTPUT SIGNAL

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

Component	Signal description	K
Steering angle sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Steering angle sensor signal 	L
Combination meter	 Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: ABS warning lamp signal VDC warning lamp signal 	M

EBD FUNCTION

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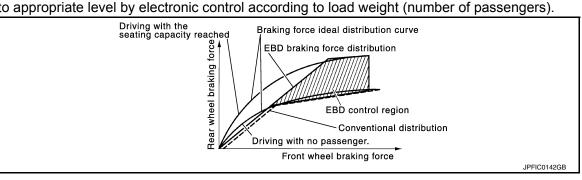
[TYPE 1]

EBD FUNCTION : System Diagram

ſ		CAN communicat	ion
Stop lamp Stop lamp Stop lamp switch switch signal Stop lamp relay			
Vacuum sensor Vacuum sensor signal			
Front wheel sensor RH	ABS actuator and		
Front wheel sensor LH	electric unit (control unit)	╺╼╼╼╼┻┻╍	Combination meter
Rear wheel sensor RH			
Rear wheel sensor LH			
Yaw rate/side/decel G sensor Communication line			
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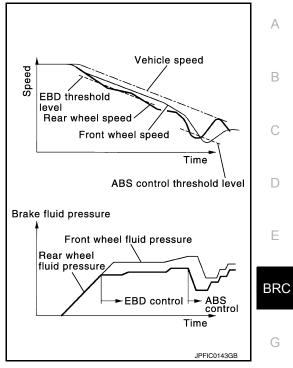
EBD FUNCTION : System Description

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



< SYSTEM DESCRIPTION >

- During braking, control unit portion compares slight slip on front ٠ and rear wheels by wheel speed sensor signal, transmits drive signal to actuator portion when rear wheel slip exceeds front wheel slip for the specified value or more, and controls rear wheel brake force (brake fluid pressure) so that increase of rear wheel slip is prevented and slips on front wheel and rear wheel are nearly equalized. ABS control is applied when slip on each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT can be used to diagnose the system.
- · Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for VDC function, TCS function, ABS function, EBD function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function and hill start assist function. Refer to BRC-23, "Fail-Safe".



[TYPE 1]

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INPUT SIGNAL AND OUTPUT SIGNAL

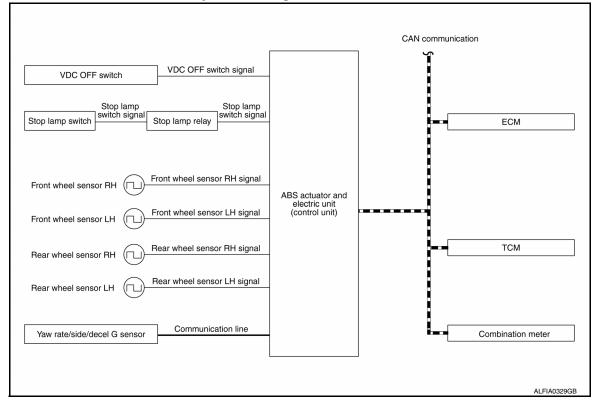
Major signal transmission between each unit via communication lines is shown in the following table.

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

HIII START ASSIST FUNCTION

< SYSTEM DESCRIPTION >

Hill start assist FUNCTION : System Diagram



Hill start assist FUNCTION : System Description

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- 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 an uphill slope of slope ratio 10% or more and selector lever is in any position other than P (Park) or N (Neutral).
- 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 starts by accelerator operation, the brake is released automatically and a smooth start is performed.
- Fail-safe function is adopted. When a malfunction occurs in hill start assist function, the control is suspended for VDC function, TCS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-23</u>, "Fail-Safe".

INPUT SIGNAL AND OUTPUT SIGNAL

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

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

< SYSTEM DESCRIPTION >

< SYSTEM DESCRIPTIO	N > [TYPE 1]	
Component	Signal description	
ТСМ	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: Shift position signal 	A
	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Brake fluid level switch signal 	В
Combination meter	 Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: VDC warning lamp signal 	С
	VDC OFF indicator lamp signal	D

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

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

< SYSTEM DESCRIPTION >

[TYPE 1]

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

CONSULT Function

INFOID:000000011644915

CAUTION:

After disconnecting the CONSULT vehicle interface (VI) from the data link connector, the ignition must be cycled OFF \rightarrow ON (for at least 5 seconds) \rightarrow OFF. If this step is not performed, the BCM may not go to "sleep mode", potentially causing a discharged battery and a no-start condition.

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 elec- tric unit (control unit) and also shifts some parameters in a specified range.
WORK SUPPORT	Components can be quickly and accurately adjusted.

*: The following diagnosis information is erased by erasing.

• DTC

• Freeze frame data (FFD)

ECU IDENTIFICATION

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

SELF DIAGNOSTIC RESULT

Refer to <u>BRC-47, "DTC Index"</u>.

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 → 338 → 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:

< SYSTEM DESCRIPTION >

[TYPE 1]

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

Testitem	Disalau Itara		Display		
Test item	Display Item	Up	Кеер	Down	D
FR RH SOL	FR RH IN SOL	Off	On*	On*	
FR RH SUL	FR RH OUT SOL	Off	Off	On*	E
	FR LH IN SOL	Off	On*	On*	
FR LH SOL	FR LH OUT SOL	Off	Off	On*	
RR RH SOL	RR RH IN SOL	Off	On*	On*	BRC
KK KH SUL	RR RH OUT SOL	Off	Off	On*	
RR LH SOL	RR LH IN SOL	Off	On*	On*	G
	RR LH OUT SOL	Off	Off	On*	

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

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

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

T = 1.11 = 12			Display	
Test item	Display Item	Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
FR RH ABS SOLE-	FR RH OUT SOL	Off	Off	Off
NOID (ACT)	CV1	Off	Off	Off
	CV2	Off	On*	On*
	FR LH IN SOL	Off	Off	Off
FR LH ABS SOLE-	FR LH OUT SOL	Off	Off	Off
NOID (ACT)	CV1	Off	On*	On*
	CV2	Off	Off	Off
	RR RH IN SOL	Off	Off	Off
RR RH ABS SOLE-	RR RH OUT SOL	Off	Off	Off
NOID (ACT)	CV1	Off	On*	On*
	CV2	Off	Off	Off
	RR LH IN SOL	Off	On*	Off
RR LH ABS SOLE-	RR LH OUT SOL	Off	Off	Off
NOID (ACT)	CV1	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.

< SYSTEM DESCRIPTION >

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

NOTE:

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

DATA MONITOR

	Monitor iter	m selection		
Item (Unit)	ECU INPUT SIG- NALS	MAIN SIGNALS	Note	
FR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front LH wheel sensor is displayed.	
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front RH wheel sensor is displayed.	
RR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear LH wheel sensor is displayed.	
RR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear RH wheel sensor is displayed.	
DECEL G-SEN (m/s ²)	×	×	Decel G detected by decel G sensor is displayed.	
FR RH IN SOL (On/Off)		×	Operation status of front RH wheel ABS IN valve is displayed.	
FR RH OUT SOL (On/Off)		×	Operation status of front RH wheel ABS OUT valve is displayed.	
FR LH IN SOL (On/Off)		×	Operation status of front LH wheel ABS IN valve is displayed.	
FR LH OUT SOL (On/Off)		×	Operation status of front LH wheel ABS OUT valve is displayed.	
RR RH IN SOL (On/Off)		×	Operation status of rear RH wheel ABS IN valve is displayed.	
RR RH OUT SOL (On/Off)		×	Operation status of rear RH wheel ABS OUT valve is displayed.	
RR LH IN SOL (On/Off)		×	Operation status of rear LH wheel ABS IN valve is displayed.	
RR LH OUT SOL (On/Off)		×	Operation status of rear LH wheel ABS OUT valve is displayed.	
EBD WARN LAMP (On/Off)			Brake warning lamp ON/OFF status is displayed. (Note 1)	
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal input status is displayed.	
MOTOR RELAY (On/Off)		×	ABS motor and motor relay status is displayed.	
ACTUATOR RLY (On/Off)		×	ABS actuator relay status is displayed.	
ABS WARN LAMP (On/Off)		×	ABS warning lamp ON/OFF status is displayed. ^(Note 1)	
OFF LAMP (On/Off)		×	VDC OFF indicator lamp ON/OFF status is displayed. ^(Note 1)	
OFF SW (On/Off)	×	×	VDC OFF switch status is displayed	

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< SYSTEM DESCRIPTION >

	Monitor item selection			
Item (Unit)	ECU INPUT SIG- NALS	MAIN SIGNALS	Note	
SLIP/VDC LAMP On/Off)		×	VDC warning lamp ON/OFF status is displayed. ^(Note 1)	
BATTERY VOLT (V)	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.	
GEAR	×	×	Current gear position judged from current gear position sig nal is displayed.	
SLCT LVR POSI	×	×	Current gear position judged from current gear position sig nal is displayed.	
ENGINE SPEED (tr/min)	×	×	Engine speed status is displayed.	
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate sensor is displayed.	
R POSI SIG (On/Off)			R range signal input status judged from R range signal is displayed.	
N POSI SIG (On/Off)			N range signal input status judged from N range signal is displayed.	
CV1 (On/Off)			Cut valve 1 operation status is displayed.	
CV2 (On/Off)			Cut valve 2 operation status is displayed.	
ACCEL POS SIG (%)	×		Displays the Accelerator pedal position.	
SIDE G -SENSOR (m/s ²)	×		Side G detected by side G sensor is displayed.	
STR ANGLE SIG (°)	×		Steering angle detected by steering angle sensor is displayed.	
PRESS SENSOR (bar)	×		Brake fluid pressure detected by pressure sensor is dis- played.	
EBD SIGNAL (On/Off)			EBD operation status is displayed.	
ABS SIGNAL (On/Off)			ABS operation status is displayed.	
TCS SIGNAL (On/Off)			TCS operation status is displayed.	
VDC SIGNAL (On/Off)			VDC operation status is displayed.	
EBD FAIL SIG (On/Off)			EBD fail-safe signal status is displayed.	
ABS FAIL SIG (On/Off)			ABS fail-safe signal status is displayed.	
TCS FAIL SIG (On/Off)			TCS fail-safe signal status is displayed.	
VDC FAIL SIG (On/Off)			VDC fail-safe signal status is displayed.	
CRANKING SIG (On/Off)			Cranking status is displayed.	
FLUID LEV SW (On/Off)	×		Brake fluid level signal input status via CAN communication is displayed.	

< SYSTEM DESCRIPTION >

[TYPE 1]

	Monitor item selection			
Item (Unit)	ECU INPUT SIG- NALS	MAIN SIGNALS	Note	
PARK BRAKE SW (On/Off)	×		Parking brake switch signal input status via CAN communi- cation is displayed.	
USS SIG ^(Note 2) (On/Off)			Hill start assist operation status is displayed.	

Note 1: Refer to <u>BRC-15. "System Description"</u> for ON/OFF conditions of each warning lamp and indicator lamp.

Note 2: 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.

< ECU DIAGNOSIS INFORMATION > ECU DIAGNOSIS INFORMATION **APPLICATION NOTICE**

Application Notice

Service information	Remarks	
TYPE 1	VDC/TCS/ABS	
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS	

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[TYPE 1]

INFOID:000000011645021

< ECU DIAGNOSIS INFORMATION >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000011644916

[TYPE 1]

CONSULT DATA MONITOR STANDARD VALUE

Monitor item	Condition	Reference values in normal operation
	Vehicle stopped	0.00 km/h (MPH)
FR LH SENSOR	When driving ^(Note 1)	Nearly matches the speedometer display (within $\pm 10\%$)
	Vehicle stopped	0.00 km/h (MPH)
FR RH SENSOR	When driving ^(Note 1)	Nearly matches the speedometer display (within $\pm 10\%$)
	Vehicle stopped	0.00 km/h (MPH)
RR LH SENSOR	When driving ^(Note 1)	Nearly matches the speedometer display (within $\pm 10\%$)
	Vehicle stopped	0.00 km/h (MPH)
RR RH SENSOR	When driving ^(Note 1)	Nearly matches the speedometer display (within $\pm 10\%$)
	When stopped	Approx. 0 m/s ²
DECEL G-SEN	During acceleration	Positive value
	During deceleration	Negative value
	Active	On
FR RH IN SOL	Not activated	Off
	Active	On
FR RH OUT SOL	Not activated	Off
	Active	On
FR LH IN SOL	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
	When brake warning lamp is ON ^(Note 2)	On
EBD WARN LAMP	When brake warning lamp is OFF ^(Note 2)	Off
	Brake pedal depressed	On
STOP LAMP SW	Brake pedal not depressed	Off
	Active	On
MOTOR RELAY	Not activated	Off
	Active	On
ACTUATOR RLY	When not operating (in fail-safe mode)	Off

< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition	Reference values in normal operation
	When ABS warning lamp is ON ^(Note 2)	On
ABS WARN LAMP	When ABS warning lamp is OFF ^(Note 2)	Off
	When VDC OFF indicator lamp is ON ^(Note 2)	On
OFF LAMP	When VDC OFF indicator lamp is OFF ^(Note 2)	Off
	When VDC OFF switch is ON	On
OFF SW	When VDC OFF switch is OFF	Off
	When VDC warning lamp is ON ^(Note 2)	On
SLIP/VDC LAMP	When VDC warning lamp is OFF ^(Note 2)	Off
BATTERY VOLT	Ignition switch ON	10 – 16 V
GEAR	Driving	1 – 7 Depending on shift status
SLCT LVR POSI	Vehicle stopped	N/P Depending on shift status
ENGINE SPEED	Engine stopped	0 tr/min
	Engine running	Almost same reading as tachometer
	Vehicle stopped	Approx. 0 d/s
YAW RATE SEN	Turning right	Negative value
	Turning left	Positive value
R POSI SIG	When selector lever is in the R position	On
	When selector lever is in the other position than R	Off
N POSI SIG	When selector lever is in the N position	On
	When selector lever is in the other position than N	Off
CV1	Active	On
	Not activated	Off
CV2	Active	On On
	Not activated	Off
ACCEL POS SIG	Never depress accelerator pedal (with ignition switch ON)	0%
	Depress accelerator pedal (with ignition switch ON)	0 – 100%
	Vehicle stopped	Approx. 0 m/s ²
SIDE G-SENSOR	Right turn	Negative value
	Left turn	Positive value
	When driving straight	0±2.5°
STR ANGLE SIG	When steering wheel is steered to LH by 90°	Approx. +90°
	When steering wheel is steered to RH by 90°	Approx. –90°
PRESS SENSOR	Brake pedal not depressed	Approx. 0 bar
LLOO JENJOK	Brake pedal depressed	(-40) – (+300 bar)
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

< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition	Reference values in normal operation
VDC SIGNAL	VDC activated	On
VDC SIGNAL	VDC not activated	Off
EBD FAIL SIG	In EBD fail-safe	On
LDD I AIL SIG	EBD is normal	Off
ABS FAIL SIG	In ABS fail-safe	On
ABS FAIL SIG	ABS is normal	Off
TCS FAIL SIG	In TCS fail-safe	On
TCS FAIL SIG	TCS is normal	Off
VDC FAIL SIG	In VDC fail-safe	On
VDC FAIL SIG	VDC is normal	Off
CRANKING SIG	At cranking	On
CRAINING SIG	Other than at cranking	Off
FLUID LEV SW	When brake fluid level switch is ON (brake fluid level is less than the specified level)	On
	When brake fluid level switch is OFF	Off
PARK BRAKE SW	When parking brake is active	On
FARR DRAKE SW	Parking brake is released	Off
USS SIG ^(Note 3)	Hill start assist is active	On
035 516	Hill start assist is inactive	Off

Note 1: Confirm tire pressure is standard value.

Note 2: Refer to <u>BRC-15</u>, "System Description" for ON/OFF conditions of each warning lamp and indicator lamp.

Note 3: USS means "hill start assist."

Fail-Safe

INFOID:000000011644917

VDC FUNCTION, TCS FUNCTION AND HILL START ASSIST FUNCTION

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

< ECU DIAGNOSIS INFORMATION >

DTC	Malfunction detected condition	Fail-safe condition	
:1101	When an open circuit is detected in rear RH wheel sensor circuit.		
C1102	When an open circuit is detected in rear LH wheel sensor circuit.		
C1103	When an open circuit is detected in front RH wheel sensor circuit.		
C1104	When an open circuit is detected in front LH wheel sensor circuit.		
C1105	 When 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. 	The following functions are sus-	
C1106	 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. 	 pended: VDC function TCS function ABS function EBD function (only when both 2 rear wheels are malfunctioning) 	
C1107	 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. 	 hill start assist function 	
C1108	 When power supply voltage of front LH wheel sensor is low. When distance between front LH wheel sensor and front LH wheel sensor rotor is large. When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. 		
C1109	When ignition voltage is 10 V or less.When ignition voltage is 16 V or more.	The following functions are suspended:	
C1111	When a malfunction is detected in motor or motor relay.	 VDC function TCS function ABS function EBD function hill start assist function 	
C1115	When difference in wheel speed between any wheel and others is detected during the vehicle is driven because of installation of other tires than specified.	The following functions are suspended:	
C1116	When stop lamp switch signal is not input when brake pedal operates.	 VDC function TCS function ABS function hill start assist function 	
C1120	When a malfunction is detected in front LH ABS IN valve.		
C1121	When a malfunction is detected in front LH ABS OUT valve.	The following functions are sus-	
C1122	When a malfunction is detected in front RH ABS IN valve.	pended:	
C1123	When a malfunction is detected in front RH ABS OUT valve.	VDC function TCS function	
C1124	When a malfunction is detected in rear LH ABS IN valve.	 TCS function ABS function EBD function hill start assist function 	
C1125	When a malfunction is detected in rear LH ABS OUT valve.		
C1126	When a malfunction is detected in rear RH ABS IN valve.		
C1127	When a malfunction is detected in rear RH ABS OUT valve.		
C1130	When a malfunction is detected in ECM system.	The following functions are sus- pended: • VDC function • TCS function • hill start assist function	

< ECU DIAGNOSIS INFORMATION >

DTC	Malfunction detected condition	Fail-safe condition
C1140	When a malfunction is detected in actuator relay.	The following functions are sus- pended: • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1142	When a malfunction is detected in pressure sensor.	The following functions are sus-
C1143	When a malfunction is detected in steering angle sensor.	pended:VDC function
C1144	When neutral position adjustment of steering angle sensor is not complete.	TCS function
C1145	When a malfunction is detected in yaw rate signal.	hill start assist function
C1146	When a malfunction is detected in side/decel G signal.	The following functions are sus-
C1155	When brake fluid level low signal is detected.	 pended: VDC function TCS function ABS function hill start assist function
C1160	When calibration of yaw rate/side/decel G sensor is not complete.	The following functions are sus- pended: • VDC function • TCS function • hill start assist function
C1164	When a malfunction is detected in cut valve 1.	The following functions are sus-
C1165	When a malfunction is detected in cut valve 2.	pended:VDC function
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	 TCS function ABS function EBD function hill start assist function
C1197	When a malfunction is detected in vacuum sensor.	
C1198	 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. 	Electrical vacuum assistance of brake booster is suspended.
C1199	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.	_
C119A	When a malfunction is detected in supply power voltage of vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.
U1000	When CAN communication signal is not continuously received for 2 seconds or more.	 The following functions are suspended: VDC function TCS function hill start assist function

DTC Inspection Priority Chart

INFOID:000000011644918

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

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

< ECU DIAGNOSIS INFORMATION >

[TYPE 1]

Priority	Detected item (DTC)	
	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	
5	CT125 FR RH OUT ABS SOL CT124 RR LH IN ABS SOL	
5	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

INFOID:000000011644919

DTC	Display Item	Refer to
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	PPC 66 "PTC Logic"
C1103	FR RH SENSOR-1	BRC-66, "DTC Logic"
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	PPC 70 "DTC Logic"
C1107	FR RH SENSOR-2	BRC-70, "DTC Logic"
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNOMAL]	BRC-72, "DTC Logic"
C1111	PUMP MOTOR	BRC-74, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-76, "DTC Logic"
C1116	STOP LAMP SW	BRC-78, "DTC Logic"
C1120	FR LH IN ABS SOL	BRC-80, "DTC Logic"
C1121	FR LH OUT ABS SOL	BRC-82, "DTC Logic"
C1122	FR RH IN ABS SOL	BRC-80, "DTC Logic"
C1123	FR RH OUT ABS SOL	BRC-82, "DTC Logic"
C1124	RR LH IN ABS SOL	BRC-80, "DTC Logic"
C1125	RR LH OUT ABS SOL	BRC-82, "DTC Logic"
C1126	RR RH IN ABS SOL	BRC-80, "DTC Logic"
C1127	RR RH OUT ABS SOL	BRC-82, "DTC Logic"

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DTC	Display Item	Refer to
C1130	ENGINE SIGNAL 1	BRC-84, "DTC Logic"
C1140	ACTUATOR RLY	BRC-85, "DTC Logic"
C1142	PRESS SEN CIRCUIT	BRC-87, "DTC Logic"
C1143	ST ANG SEN CIRCUIT	BRC-89, "DTC Logic"
C1144	ST ANG SEN SIGNAL	BRC-91, "DTC Logic"
C1145	YAW RATE SENSOR	BRC-92, "DTC Logic"
C1146	SIDE G SEN CIRCUIT	BRC-32, DTC Logic
C1155	BR FLUID LEVEL LOW	BRC-95, "DTC Logic"
C1160	DECEL G SEN SET	BRC-97, "DTC Logic"
C1164	CV 1	BRC-98, "DTC Logic"
C1165	CV 2	BRC-30, DTC Logic
C1170	VARIANT CODING	BRC-100, "DTC Logic"
C1197	VACUUM SENSOR	BRC-101, "DTC Logic"
C1198	VACUUM SEN CIR	BRC-103, "DTC Logic"
C1199	BRAKE BOOSTER	BRC-105, "DTC Logic"
C119A	VACUUM SEN VOLT	BRC-107, "DTC Logic"
U1000	CAN COMM CIRCUIT	BRC-109, "DTC Logic"

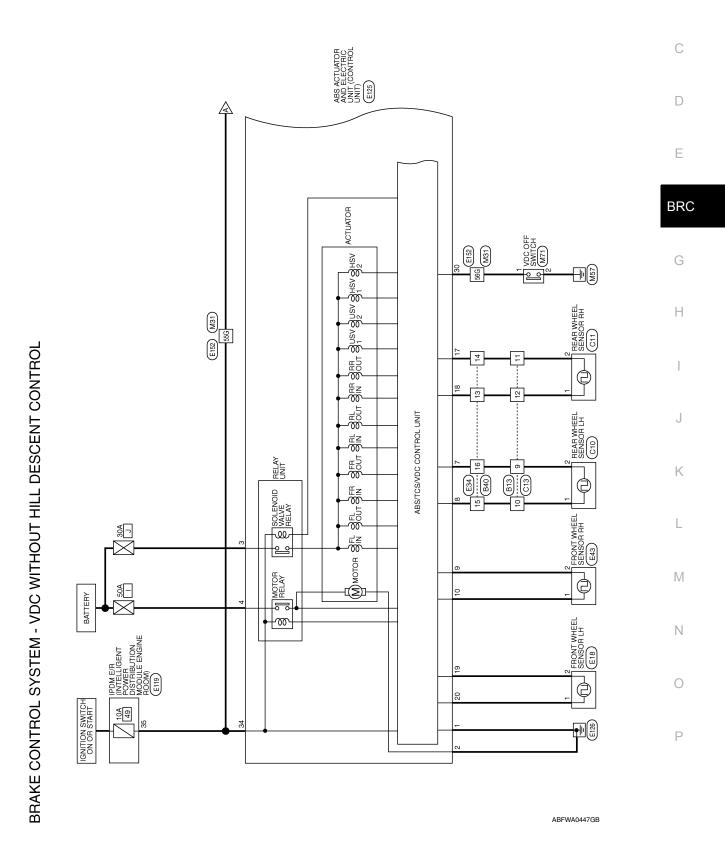
WIRING DIAGRAM BRAKE CONTROL SYSTEM

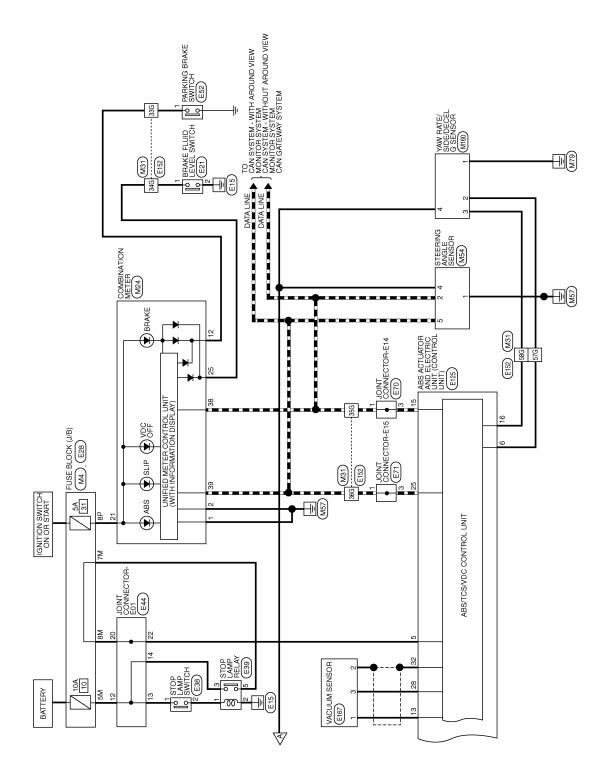
Wiring Diagram



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ABFWA0448GB

Signal Name	GND1	GND2	PKB	IGN	BRAKE OIL SW	CAN-L	CAN-H			STEERING ANGLE SENSOR	TE			2 3 4 6 7 0				Signal Name	I	I	1	I						
Color of Wire	в	в	თ	BG	თ	٩	_		MEA					u	า			Color of Wire	GB	٩.	σ	_						
Terminal No.	-	2	12	21	25	38	39		Connector No	Connector Name	Connector Color		E	H.S.				Terminal No.	-	0	4	D						
]		7 6 5 4 3 2 1	27 26 25 24 23 22 21																							
M24 COMBINATION METER		1		19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1	5 34 33 32 31 30 29 28 3					Signal Name	I	I	I	I	1	I	I	I										
e		:		19 18 17 16 1	39 38 37 36 3					o. Wire	G	J	₽.	_	σ	۹.	۹.	_										
Connector No. Connector Name	Connector (悟	H.S.						Terminal No.	33G	34G	35G	36G	55G	56G	57G	58G										
][
		1					ame							5G	9G 10G		36 196 206 216 36 206 206		3a 39a 40a 41a 3a 49a 50a	3659660616	36 696 706	3G79G80G81G	36896906	UE U	100G]		
			ا	8							.			3G 4G	6G 7G 8G 9G		15G 16G 1/G 18		a 30a 30a 3/a 3/ a 45a 46a 47a 48	sselseels7els	365G66G67G68	756 766 776 78	86G87G86	916 and and and and	966 976 986 996 1006			
BLOCK (J/B)			P 3P 2P 1P	3P/12P/11P/10P/9P/8P			Signal Name			TO WIRF				1G 2G	6G 7		14G	£ }	8 4	12	13	74G	34G 850	916	36 0 010			
lo. M4 Jame FLISF BLOCK (J/R)	color WHITE		7P 6P 5P 4P 3P 2P 1P	116P115P14P113P112P111P110P 9P 8P			Color of Wire	BG		IO. MIST Jame WIBF TO WIBF	color WHITE			16 26	6G 7		116126136146156156166176186196206216		310 320 330 34 42G 43G 44	516526536540	62G63G640	71G/22G/73G/74G/75G/76G/77G/78G/79G/80G/81G	82G83G84G850	916	096 096			
Connector No. M4 Connector Name ELISE BLOCK (J/R)	Connector Color WHITE		[7P 6P 5P 4P 3P 2P 1P	S.						Connector Name WIRF TO WIRF	Connector Color WHITE			H.S.			116126136146		31G32G33G44	519529539540	626636640	716/726/736/746	82G83G84G850	91G	096 096			

< WIRING DIAGRAM >

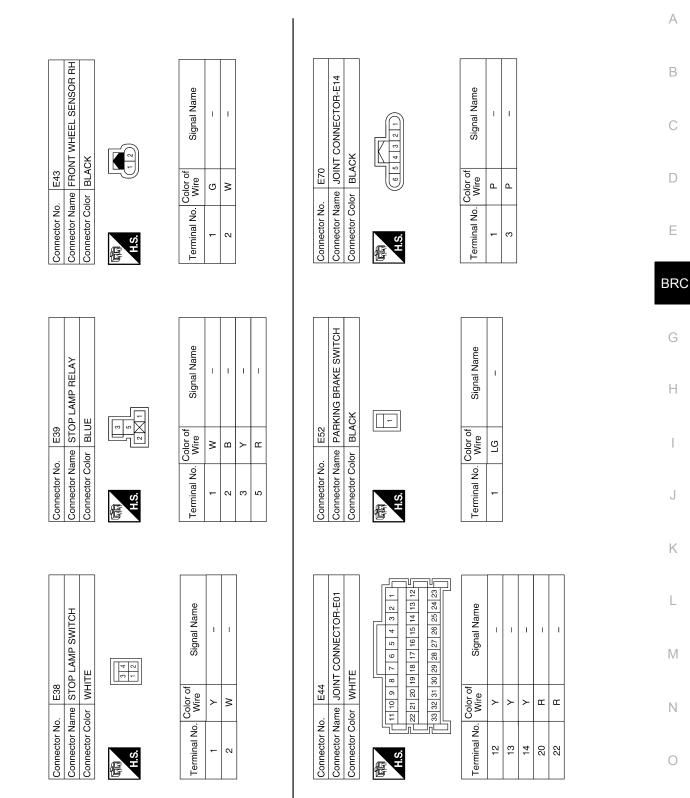
BLACK Connector rate WINS PATE SIDE DECEL Connector rate WINS PATE SIDE DECEL BLACK Ender of the stress of the stres

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BRAKE CONTROL SYSTEM

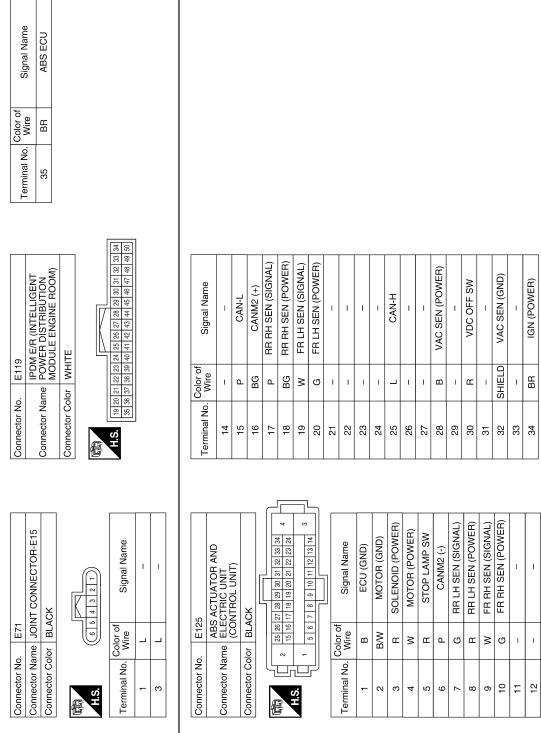
< WIRING DIAGRAM >

[TYPE 1]



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VAC SEN (SIGNAL)

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< WIRING DIAGRAM >	[TYPE 1]
	A
Signal Name	B C
E167 VACUUM VACUUM In or of B B B B B B B B B B B B B C C 13 W B C C C C C C C C C C C C C C C C C C	> D
Connector No. Connector Name Connector Name Connector Name Terminal No. Connector No. 10 11	E E
	BRC
G Signal Name G Signal Name G C Signal Name C C C C C C C C C C C C C C C C C C C	G H
	I
Terminal No. Col 33G L 33G L 33G L 55G B 56G B 5 P	J
	К
E152 Dr WHRE TO WIRE Dr WHIE Dr WHIE Dr WHIE Dr WHIE Dr WHIE Dr WHIE Dr Sol Sol Sol <	L
0. E152 mme WIRE TO WIRE blor WIRE TO WIRE blor WIRE TO WIRE blor WHITE solgeselestration 95 solgeselestration 96 solgesolgeselestration 96	M
Connector No. E152 Connector Name WIRE TO WIRE Maintain State State State	N

BRAKE CONTROL SYSTEM

Revision: September 2014

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ABFIA0727GB

Connector Name WIRE TO WIRE Connector Color BLACK

Connector No. B13

Connector Name WIRE TO WIRE Connector Color WHITE MITE 1 1 2 4 5 6 7 10 11 12 13 14 15 6 7 12 2	Connector No.	r No		-	B40									
Connector Color WHTE 前 1 1 1 1 1 1 1 1 1 1 1 1 1	Connecto	r Na	Ĕ	-	N	Щ	Ĕ	0	ž	Щ				
H.S. 13 14 15 16 17 18 19 20 21 22 23 24	Connecto	ပိ	p	-	∣₹∣	Ę	ш							
H.S. 13 14 15 16 17 18 19 20 21 22 23 24														
H.S. 13 14 15 16 17 18 19 20 21 22 23 24	f				Ч				17					
13 14 15 16 17 18 19 20 21 22 23 24	ЧС	-		ŝ		ŝ	9	7	8	6	5	÷	12	
	0	13	14	15	16	17	18	19	20	21	22	23	24	
			11	1	1	1	1	11		11		11	1	

,					
	Signal Name	I	I	I	I
	Color of Wire	Γ	٩	BR	≻
	Terminal No. Color of Wire	13	14	15	16

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4 8 5 1 1 0 1 1 0 0 1	Signal Name	I	I	I
 ₽	Color of Wire	Y	BR	Ч
H.S.	Terminal No. Color of Wire	6	10	11

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APPLICATION NOTICE

BASIC INSPECTION APPLICATION NOTICE

Application Notice

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INFOID:000000011645022

[TYPE 1]

Service information	Remarks	C
TYPE 1	VDC/TCS/ABS	0
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS	

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< BASIC INSPECTION >

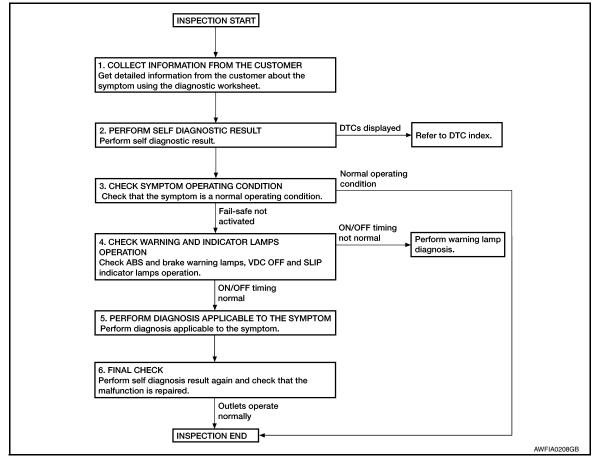
DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

[TYPE 1]

INFOID:000000011644921

OVERALL SEQUENCE



DETAILED FLOW

1.COLLECT INFORMATION FROM THE CUSTOMER

Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnostic worksheet. Refer to <u>BRC-59</u>, "<u>Diagnostic Work Sheet</u>".

>> GO TO 2.

2. PERFORM SELF-DIAGNOSTIC RESULT

Perform self-diagnostic result. Refer to BRC-36. "CONSULT Function".

Are any DTCs displayed?

YES >> Refer to <u>BRC-47, "DTC Index"</u>.

NO >> GO TO 3.

3.CHECK SYMPTOM OPERATING CONDITION

Check that the symptom is a normal operating condition. Refer to <u>BRC-125, "Description"</u>.

Is the symptom a normal operating condition?

YES >> Inspection End.

NO >> GO TO 4.

4.CHECK WARNING AND INDICATOR LAMPS OPERATION

Check ABS and brake warning lamps, VDC OFF and SLIP indicator lamps operation. Refer to <u>BRC-15. "Sys-</u> tem Description".

Is ON/OFF timing normal?

Revision: September 2014

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

YES NO	 >> GO TO 5. >> Perform warning lamp diagnosis. Refer to <u>BRC-113</u>, "<u>Component Function Check</u>" (ABS warning lamp), <u>BRC-114</u>, "<u>Component Function Check</u>" (brake warning lamp), <u>BRC-115</u>, "<u>Component Function Check</u>" (SLIP indi- <u>Function Check</u>" (VDC OFF indicator lamp) or <u>BRC-116</u>, "<u>Component Function Check</u>" (SLIP indi- 	A
_	cator lamp).	В

5.PERFORM DIAGNOSIS APPLICABLE TO THE SYMPTOM

Perform diagnosis applicable to the symptom. Refer to <u>BRC-118, "Symptom Table"</u>.

>> GO TO 6.

6.FINAL CHECK

Perform self-diagnostic result again, and check that the malfunction is repaired. After checking, erase the selfdiagnosis memory. Refer to <u>BRC-36</u>, "CONSULT Function".

>> Inspection End.

Diagnostic Work Sheet

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

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[TYPE 1]

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

< BASIC INSPECTION >

[TYPE 1]

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

Description

INFOID:000000011644923

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

- Neutral position adjustment for the steering angle sensor
- Calibration of the decel G sensor

Work Procedure

INFOID:000000011644924

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to <u>BRC-61, "Work Procedure"</u>, GO TO 2.

2.PERFORM CALIBRATION OF THE DECEL G SENSOR

Perform calibration of the decel G sensor.

>> Refer to <u>BRC-63, "Work Procedure"</u>.

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION [TYPE 1]

< BASIC INSPECTION >

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

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Situation	Adjustment of steering angle sensor neutral position
Removing/Installing ABS actuator and electric unit (control unit)	
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/Installing steering components	×
Replacing steering components	x
Removing/Installing suspension components	x
Replacing suspension components	x
Change tires to new ones	
Tire rotation	
Adjusting wheel alignment	×
Battery disconnection	×
ALIGN THE VEHICLE STATUS	r, make sure to use CONSULT.
Adjustment cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Stop vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM THE NEUTRAL POSITION ADJUSTM	on.
ALIGN THE VEHICLE STATUS Stop vehicle with front wheels in straight-ahead position >> GO TO 2.	on. ENT FOR THE STEERING ANGLE SENSOR RT" and "ST ANG SEN ADJUSTMENT" in order. teering angle sensor.
 ALIGN THE VEHICLE STATUS Stop vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM THE NEUTRAL POSITION ADJUSTM On the CONSULT screen, touch "WORK SUPPO Touch "START". CAUTION: Do not touch steering wheel while adjusting s After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automatic turn ignition switch OFF, then turn it ON again. CAUTION: 	on. ENT FOR THE STEERING ANGLE SENSOR RT" and "ST ANG SEN ADJUSTMENT" in order. teering angle sensor. cally.

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

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

• ABS actuator and electric unit (control unit): Refer to <u>BRC-36, "CONSULT Function"</u>.

• ECM: Refer to <u>EC-72</u>, "<u>CONSULT Function</u>" (USA and Canada) or <u>EC-581</u>, "<u>CONSULT Function</u>" (Mexico).

Are the memories erased?

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

CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

CALIBRATION OF DECEL G SENSOR

Description

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

Situation	Calibration of decel G sensor
Removing/Installing ABS actuator and electric unit (control unit)	
Replacing ABS actuator and electric unit (control unit)	x
Removing/Installing steering components	
Replacing steering components	
Removing/Installing suspension components	_
Replacing suspension components	_
Removing/Installing tire	-
Replacing tire	-
Tire rotation	-
Adjusting wheel alignment	_
Removing/Installing yaw rate/side/decel G sensor	x
Replacing yaw rate/side/decel G sensor	x
Vork Procedure	INFOID:000000011644928
o calibrate the decel G sensor, make sure to use Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS	CONSULI.
Calibration cannot be done without CONSULT). .ALIGN THE VEHICLE STATUS	
Calibration cannot be done without CONSULT).	
Calibration cannot be done without CONSULT). .ALIGN THE VEHICLE STATUS	
Calibration cannot be done without CONSULT). .ALIGN THE VEHICLE STATUS top vehicle with front wheels in straight-ahead positio	on.
Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS top vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF . On the CONSULT screen, touch "WORK SUPPOR	on. R
Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS top vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPOR Touch "START".	on. R
Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS top vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF . On the CONSULT screen, touch "WORK SUPPOR	on. R
 Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Atop vehicle with front wheels in straight-ahead position > GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPOR Touch "START". After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automatic 	on. RT" and "DECEL G SEN CALIBRATION" in order.
Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Stop vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPON Touch "START". After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automation Turn ignition switch OFF, then turn it ON again.	on. RT" and "DECEL G SEN CALIBRATION" in order.
 Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Atop vehicle with front wheels in straight-ahead position > GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPOR Touch "START". After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automatic 	on. RT" and "DECEL G SEN CALIBRATION" in order.
 Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Ation vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPOR Touch "START". After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automatic Turn ignition switch OFF, then turn it ON again. CAUTION: Be sure to perform above operation. 	on. RT" and "DECEL G SEN CALIBRATION" in order.
 Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Stop vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPOI Touch "START". After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automation Turn ignition switch OFF, then turn it ON again. CAUTION: Be sure to perform above operation. >> GO TO 3. 	on. RT" and "DECEL G SEN CALIBRATION" in order.
 Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Stop vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPOI Touch "START". After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automation Turn ignition switch OFF, then turn it ON again. CAUTION: Be sure to perform above operation. >> GO TO 3. CHECK DATA MONITOR 	on. R RT" and "DECEL G SEN CALIBRATION" in order.
 Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Stop vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPOR Touch "START". After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automation Turn ignition switch OFF, then turn it ON again. CAUTION: Be sure to perform above operation. >> GO TO 3. CHECK DATA MONITOR Run vehicle with front wheels in straight-ahead point 	on. R RT" and "DECEL G SEN CALIBRATION" in order. cally.
 Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Ation vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPOR Touch "START". After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automatic Turn ignition switch OFF, then turn it ON again. CAUTION: Be sure to perform above operation. >> GO TO 3. CHECK DATA MONITOR Run vehicle with front wheels in straight-ahead pc Select "DATA MONITOR". Then make sure "DECI 	on. R RT" and "DECEL G SEN CALIBRATION" in order. cally.
 Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Atiop vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPOR Touch "START". After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automatic Turn ignition switch OFF, then turn it ON again. CAUTION: Be sure to perform above operation. >> GO TO 3. CHECK DATA MONITOR Run vehicle with front wheels in straight-ahead pc. Select "DATA MONITOR". Then make sure "DECI sthe inspection result normal? 	on. R RT" and "DECEL G SEN CALIBRATION" in order. cally.
 Calibration cannot be done without CONSULT). ALIGN THE VEHICLE STATUS Ation vehicle with front wheels in straight-ahead position >> GO TO 2. PERFORM CALIBRATION OF DECEL G SENSOF On the CONSULT screen, touch "WORK SUPPOR Touch "START". After approximately 10 seconds, touch "END". NOTE: After approximately 60 seconds, it ends automatic Turn ignition switch OFF, then turn it ON again. CAUTION: Be sure to perform above operation. >> GO TO 3. CHECK DATA MONITOR Run vehicle with front wheels in straight-ahead pc Select "DATA MONITOR". Then make sure "DECI 	on. RT" and "DECEL G SEN CALIBRATION" in order. cally. position, then stop. EL G SEN" is within ± 0.08G.

• ECM: Refer to EC-72, "CONSULT Function" (USA and Canada) or EC-581, "CONSULT Function" (Mexico).

BRC-63

INFOID:000000011644927

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< BASIC INSPECTION >

Are the memories erased?

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

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS APPLICATION NOTICE

Application Notice

[TYPE	1]
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INFOID:000000011645023

Service information	Remarks	C
TYPE 1	VDC/TCS/ABS	C
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS	

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C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Logic

INFOID:000000011644929

[TYPE 1]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

With CONSULT.

- 1. Start engine and drive vehicle at approximately 21 km/h (13 MPH) or more for approximately 5 minutes.
- 2. Perform self-diagnostic result.

Is DTC C1101, C1102, C1103 or C1104 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-66, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000011644930

Regarding Wiring Diagram information, refer to <u>BRC-49, "Wiring Diagram"</u>.

1.CONFIRM DTC

(I) With CONSULT

- 1. Perform self-diagnostic result of ABS and record all active DTCs.
- 2. Clear all DTCs.

3. Perform DTC confirmation procedure. Refer to <u>BRC-66, "DTC Logic"</u>.

Does DTC C1101, C1102, C1103 or C1104 reset?

YES >> GO TO 2.

NO >> Refer to <u>GI-47, "Intermittent Incident"</u>.

2.INSPECT WHEEL SENSOR

Inspect the suspect wheel sensor for damage or deformation.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace as necessary.

 $\mathbf{3}$. HARNESS AND CONNECTOR INSPECTION

 Disconnect ABS actuator and electric unit (control unit) connector E125 and wheel sensor connector of suspect wheel.

	AGNOSIS >			[TYPE 1]
2. Check harness, age.	connectors and termina	als for corrosion, defo	ormation, disconnection	on, looseness or dam
s the inspection resu	Ilt normal?			
YES >> GO TO 4				
	r replace as necessary.			
4.CHECK WHEEL S	SENSOR OUTPUT SIG	NAL		
	tive wheel sensor tester active wheel sensor test		ensor using appropria	te adapter.
 battery in the AB Spin the wheel of sensor tester. Th NOTE: 	ER indicator should illu S active wheel sensor t f the vehicle by hand a e red SENSOR indicato OR indicator illuminates	ester before proceedi and observe the red S or should flash ON an	ng. ENSOR indicator on d OFF to indicate an o	the ABS active whee butput signal.
retest.				
	wheel sensor tester de	tect a signal?		
YES >> GO TO 5				ront Wheel Concert -
	the wheel sensor. Refe 3. "Removal and Installa			<u>ront vvneei Sensor"</u> Ol
	HARNESS FOR SHOR			
1. Turn ignition swit				
0				
Check voltage be		arness connector term	ninals of suspect whee	el and ground.
2. Check voltage be		arness connector term	inals of suspect whee	el and ground.
	Wheel Sensor		Ground	el and ground. Voltage
2. Check voltage be Wheel		Terminal		
Wheel	Wheel Sensor	Terminal 1		
Wheel	Wheel Sensor Connector	Terminal 1 2		
Wheel Front LH	Wheel Sensor Connector	Terminal 1 2 1		
Wheel	Wheel Sensor Connector E18	Terminal 1 2 1 2 2		
Wheel Front LH Front RH	Wheel Sensor Connector E18	Terminal 1 2 1		Voltage
Wheel Front LH Front RH Rear LH	Wheel Sensor Connector E18 E43 C10	Terminal 1 2 1 2 1 2 1 2 1 2 1 2 1		Voltage
Wheel Front LH Front RH	Wheel Sensor Connector E18 E43	Terminal 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2		Voltage
Wheel Front LH Front RH Rear LH Rear RH	Wheel Sensor Connector E18 E43 C10 C11	Terminal 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1		Voltage
Wheel Front LH Front RH Rear LH Rear RH	Wheel Sensor Connector E18 E43 C10 C11	Terminal 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1		Voltage
Wheel Front LH Front RH Rear LH Rear RH s the inspection resu	Wheel Sensor Connector E18 E43 C10 C11 It normal? S.	Terminal 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1		Voltage
Wheel Front LH Front RH Rear LH Rear RH <u>s the inspection resu</u> YES >> GO TO 6 NO >> Repair th	Wheel Sensor Connector E18 E43 C10 C11 It normal? S.	Terminal 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2		Voltage
Wheel Front LH Front RH Rear LH Rear RH Is the inspection result YES >> GO TO 6 NO >> Repair th D .CHECK WIRING I 1. Turn ignition switt	Wheel Sensor Connector E18 E43 C10 C11 It normal? . e circuit. HARNESS FOR SHOR	Terminal 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 T TO GROUND	Ground	Voltage 0V
Wheel Front LH Front RH Rear LH Rear RH Is the inspection result YES >> GO TO 6 NO >> Repair th 6.CHECK WIRING I 1. Turn ignition switt	Wheel Sensor Connector E18 E43 C10 C11 It normal? . ee circuit. HARNESS FOR SHOR ch OFF.	Terminal 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 T TO GROUND	Ground	Voltage 0V

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Front LH	E18	1	
	LIO	2	
Front RH	E43	1	
TIONETAT		2	No
Rear LH	C10	1	NO
	010	2	
Rear RH	C11	1	
		2	

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair the circuit.

7. CHECK WIRING HARNESS FOR SHORT BETWEEN CIRCUITS

Check continuity between wheel sensor harness connector terminals of suspect wheel.

Whee	el Sensor	(+)	(-)	- Continuity
Wheel	Connector	Terminal	Terminal	Continuity
Front LH	E18			
Front RH	E43	1	2	No
Rear LH	C10		2	INO
Rear RH	C11	1		

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair the circuit.

8.CHECK WIRING HARNESS FOR OPEN CIRCUIT

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

Wheel sensor	ABS actuator and ele	ectric unit (control unit)	Wheel	sensor	Continuity
Wheel Selison	Connector	Terminal	Connector	Terminal	
Front LH		20	E18	1	
		19	EIO	2	•
Front RH		10	E43	1	
	E125	9	E43	2	Yes
Rear LH	L123	8	C10	1	
		7	010	2	Ţ
Rear RH		18	C11	1	
		17	OTT	2	

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair the circuit.

9. Check abs actuator and electric unit (control unit) power supply circuit

1. Turn ignition switch ON.

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Connector Terminal E125 34 s the inspection result normal? YES >> GO TO 10. NO >> Check the following: 10A fuse No. 49 located in • Harness between ABS actuator • Harness between ABS actuator IO.CHECK ABS ACTUATOR AND ELE • Turn ignition switch OFF. • Check continuity between ABS actuator and electric unit (con Connector E125 s the inspection result normal? YES >> GO TO 11. NO >> Repair or replace malfunction IO.CHECK WHEEL SENSOR INPUT V • Connect ABS actuator and electric unit • Turn ignition switch ON. • Connect ABS actuator and electric unit • Turn ignition switch ON. • Check voltage between suspect whe Wheel Sensor Wheel Sensor Wheel Connector Front LH E18 Front RH E43 Rear LH C10 Rear RH C11	uator and electric CTRIC UNIT (CC uator and electric trol unit) Terminal 1 2 hing components. OLTAGE nit (control unit) c	ONTROL UNIT) GROU unit (control unit) co Ground onnector E125.	IND CIRCUIT
a the inspection result normal? YES >> GO TO 10. NO >> Check the following: . 10A fuse No. 49 located in . Harness between ABS actu 0.CHECK ABS ACTUATOR AND ELE . Turn ignition switch OFF. . Check continuity between ABS actu ground. ABS actuator and electric unit (con Connector E125 a the inspection result normal? YES >> GO TO 11. NO >> Repair or replace malfunction 1. CHECK WHEEL SENSOR INPUT V . Connect ABS actuator and electric unit . Turn ignition switch ON. . Check voltage between suspect whe Wheel Connector Front LH E18 Eront RH E18 Connector UNE Wheel Connector	uator and electric CTRIC UNIT (CC uator and electric trol unit) Terminal 1 2 hing components. OLTAGE nit (control unit) c	Ignition switch OFF Unit (control unit) and DNTROL UNIT) GROU unit (control unit) co Ground Ground	IPDM E/R IND CIRCUIT Innector E125 terminals and Continuity
YES >> GO TO 10. NO >> Check the following: • 10A fuse No. 49 located in • Harness between ABS actu 0.CHECK ABS ACTUATOR AND ELE • Turn ignition switch OFF. • Check continuity between ABS actu ground. ABS actuator and electric unit (con Connector E125 Sthe inspection result normal? YES YES >> GO TO 11. NO >> Repair or replace malfunction 1 .CHECK WHEEL SENSOR INPUT V • Connect ABS actuator and electric unit Turn ignition switch ON. • Check voltage between suspect whe Wheel Sensor Wheel Sensor Wheel Connector Front LH E18 Front RH E43 Rear LH C10 Rear RH C11	uator and electric CTRIC UNIT (CC uator and electric trol unit) Terminal 1 2 hing components. OLTAGE nit (control unit) c	unit (control unit) and DNTROL UNIT) GROU unit (control unit) co Ground	IPDM E/R IND CIRCUIT Innector E125 terminals and Continuity
YES >> GO TO 10. NO >> Check the following: 10A fuse No. 49 located in Harness between ABS actu 0.CHECK ABS ACTUATOR AND ELE Turn ignition switch OFF. Check continuity between ABS actu ground. ABS actuator and electric unit (con Connector E125 Sthe inspection result normal? YES YES > GO TO 11. NO > Repair or replace malfunction 1 .CHECK WHEEL SENSOR INPUT V Connect ABS actuator and electric unit Turn ignition switch ON. Connect ABS actuator and electric unit Wheel Sensor Wheel Sensor Wheel Sensor Wheel Connector Front LH E18 Front RH E43 Rear LH C10 Rear RH C11	uator and electric CTRIC UNIT (CC uator and electric trol unit) Terminal 1 2 hing components. OLTAGE nit (control unit) c	ONTROL UNIT) GROU unit (control unit) co Ground onnector E125.	IND CIRCUIT
ground. ABS actuator and electric unit (con Connector E125 the inspection result normal? 'ES >> GO TO 11. IO >> Repair or replace malfunction 1. CHECK WHEEL SENSOR INPUT V Connect ABS actuator and electric un Turn ignition switch ON. Check voltage between suspect whe Wheel Sensor Wheel Sensor Wheel Sensor Wheel Sensor Orn RH E13 ear LH C10 ear RH C11	trol unit) Terminal 1 2 ning components. OLTAGE nit (control unit) c	Ground	Continuity
Connector E125 the inspection result normal? (ES >> GO TO 11. IO >> Repair or replace malfunction 1.CHECK WHEEL SENSOR INPUT V Connect ABS actuator and electric un Turn ignition switch ON. Check voltage between suspect whe Wheel Sensor Wheel Sensor Wheel Sensor Orne Connector ront LH E18 ront RH E43 ear LH C10 ear RH C11	Terminal 1 2 ning components. OLTAGE nit (control unit) co	onnector E125.	
E125 the inspection result normal? (ES >> GO TO 11. NO >> Repair or replace malfunction 1.CHECK WHEEL SENSOR INPUT V Connect ABS actuator and electric un Turn ignition switch ON. Check voltage between suspect whe Wheel Sensor Wheel Sensor Wheel Sensor Wheel Connector iront LH E18 iront RH E43 Rear LH C10 Rear RH C11	1 2 ning components. OLTAGE nit (control unit) c	onnector E125.	Yes
the inspection result normal? YES >> GO TO 11. NO >> Repair or replace malfunction 1 .CHECK WHEEL SENSOR INPUT V Connect ABS actuator and electric un Turn ignition switch ON. Check voltage between suspect whe Wheel Sensor Wheel Sensor Wheel Connector Front LH E18 Front RH E43 Rear LH C10 Rear RH C11	ning components. OLTAGE nit (control unit) c	onnector E125.	
YES >> GO TO 11. NO >> Repair or replace malfunction 1.CHECK WHEEL SENSOR INPUT V Connect ABS actuator and electric un Turn ignition switch ON. Check voltage between suspect whe Wheel Sensor Wheel Sensor Wheel Sensor ront LH E18 ront RH E43 tear LH C10 tear RH C11	OLTAGE	onnector E125.	
WheelConnectorront LHE18ront RHE43ear LHC10ear RHC11	(+)	(-)	Voltage
ront LH E18 ront RH E43 lear LH C10 lear RH C11	Terminal		(Approx.)
ear LH C10 ear RH C11			
ear RH C11	_		
	1	2	Battery voltage
	_		
the inspection result normal?	1	I	1
 7ES >> Replace wheel sensor. Refe BRC-128, "Removal and Inst NO >> Replace ABS actuator and e tion". 2.CONFIRM REPAIR 	allation - Rear W	<u>heel Sensor"</u> . Then, G	O TO 12.
With CONSULT			
. Clear all DTCs.			
Perform DTC confirmation procedure		<u>6, "DTC Logic"</u> .	
Does DTC C1101, C1102, C1103 or C110 YES >> Replace ABS actuator and e <u>tion"</u> . NO >> Inspection End.		ol unit). Refer to <u>BRC</u>	-131, "Removal and Installa-

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Logic

INFOID:000000011644931

[TYPE 1]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

() With CONSULT.

- 1. Start engine and drive vehicle at approximately 21 km/h (13 MPH) or more for approximately 5 minutes.
- 2. Perform self-diagnostic result.

Is DTC C1105, C1106, C1107 or C1108 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-70, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000011644932

Regarding Wiring Diagram information, refer to BRC-49, "Wiring Diagram".

1.CONFIRM DTC

(P) With CONSULT

1. Perform self-diagnostic result of ABS and record all active DTCs.

2. Clear all DTCs.

3. Perform DTC confirmation procedure. Refer to <u>BRC-70, "DTC Logic"</u>.

Does DTC C1105, C1106, C1107 or C1108 reset?

YES >> GO TO 2.

NO >> Refer to <u>GI-47, "Intermittent Incident"</u>.

2.CHECK TIRE PRESSURE AND TIRE WEAR

Check tires for excessive wear and proper inflation. Refer to WT-66. "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace as necessary.

3.CHECK WHEEL SENSOR

Check wheel sensor for the following:

Proper installation

C1105, C1106, C1107, C1108 WHEEL SENSOR

C1105, C1106, C1107, C1108 WHEEL SENSOR	
< DTC/CIRCUIT DIAGNOSIS > [TYPE 1]	
 Physical damage Contamination 	
Is the inspection result normal?	
YES >> GO TO 4.	
NO >> Repair or replace as necessary.	
4.CHECK SENSOR ROTOR	
Check sensor rotor for the following:	
 Contamination Physical damage (missing teeth, cracks, etc.) 	
Foreign material	
• Looseness	
Is the inspection result normal?	
 YES >> Replace the wheel sensor. Refer to <u>BRC-126</u>, "<u>Removal and Installation - Front Wheel Sensor</u>" or <u>BRC-128</u>, "<u>Removal and Installation - Rear Wheel Sensor</u>". Then, GO TO 5. NO >> Repair or replace as necessary. 	
5. CONFIRM REPAIR	
(a) With CONSULT	ł
1. Clear all DTCs.	
2. Perform DTC confirmation procedure. Refer to <u>BRC-70, "DTC Logic"</u> .	
<u>Does DTC C1105, C1106, C1107 or C1108 reset?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u>	
tion".	
NO >> Inspection End.	

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C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1109 POWER AND GROUND SYSTEM

DTC Logic

INFOID:0000000011644933

[TYPE 1]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

(B) With CONSULT.

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

Is DTC C1109 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-72, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000011644934

Regarding Wiring Diagram information, refer to BRC-49, "Wiring Diagram".

1.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connectors.
- 3. Check connectors and terminals for deformation, disconnection, looseness or damage.
- Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 34 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			(Αρριοκ.)
E125	34	_	Ignition switch ON	Battery voltage
E125			Ignition switch OFF	0V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminals 3, 4 and ground.

ABS actuator and electric unit (control unit)		Ground	Voltage
Connector	Terminal	Crodina	(Approx.)

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

< DTC/CIRCUIT DIAGNOS	IS >		
E125	3 4		Battery voltage
4. CHECK ABS ACTUATOR 1. Turn ignition switch OFF	al? e malfunctioning components. R AND ELECTRIC UNIT (CON		
_	lectric unit (control unit)		
Connector	Terminal		Continuity
E125	1 2	Ground	Yes

C1111 PUMP MOTOR

< DTC/CIRCUIT DIAGNOSIS >

C1111 PUMP MOTOR

DTC Logic

INFOID:000000011644935

[TYPE 1]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

(B) With CONSULT.

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

Is DTC C1111 detected?

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

Diagnosis Procedure

INFOID:000000011644936

Regarding Wiring Diagram information, refer to <u>BRC-49, "Wiring Diagram"</u>.

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

2.CHECK ABS MOTOR AND MOTOR RELAY BATTERY POWER SUPPLY

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

ABS actuator and ele	ABS actuator and electric unit (control unit)		Voltage	
Connector	Terminal		(Approx.)	
E125	4	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 1, 2 and ground.

C1111 PUMP MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

ABS actuator and elector	Terminal		Continuity
	1		
E125	2	Ground	Yes
ne inspection result normal	?		
ES >> Replace ABS actu	ator and electric unit (contr	ol unit). Refer to BRC-131,	Removal and Installa
tion"	·		
>> Repair or replace	narness.		

C1115 ABS SENSOR [ABNORMAL SIGNAL]

< DTC/CIRCUIT DIAGNOSIS >

C1115 ABS SENSOR [ABNORMAL SIGNAL]

DTC Logic

INFOID:000000011644937

[TYPE 1]

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When difference in wheel speed between any wheel and others is detected while the vehicle is driven be- cause of installation of tires other than specified.	 Harness or connector Wheel sensor Sensor rotor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

(B) With CONSULT.

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

Is DTC C1115 detected?

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

Diagnosis Procedure

INFOID:0000000011644938

Regarding Wiring Diagram information, refer to <u>BRC-49, "Wiring Diagram"</u>.

CAUTION:

Do not check between wheel sensor terminals.

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

2. CHECK WHEEL SENSOR OUTPUT SIGNAL

- 1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- 2. Turn on the ABS active wheel sensor tester power switch.
- NOTE:

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

 Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal. NOTE:

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3.

- NO >> Replace the wheel sensor. Refer to <u>BRC-126</u>, "Removal and Installation Front Wheel Sensor" or <u>BRC-128</u>, "Removal and Installation Rear Wheel Sensor".
- **3.**CHECK TIRES

Check the inflation pressure, wear and size of each tire. <u>Is the inspection result normal?</u>

C1115 ABS SENSOR [ABNORMAL SIGNAL]

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

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YES >> GO TO 4.

NO >> Adjust tire pressure, or replace tire(s).

4.CHECK WIRING HARNESS FOR SHORT CIRCUIT

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

Wheel Sensor			Ground	Continuity		
Wheel	Connector	Terminal	Ground	Continuity		
Front LH	E18	1				
	EIO	2				
Front RH	E43	1	No			
	⊑43	2			No	
Rear LH	C10	1		NO		
	010	2				
Rear RH	C11	1				
		2				

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair the circuit.

5. CHECK WIRING HARNESS FOR OPEN CIRCUIT

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

Wheel concor	ABS actuator and ele	ectric unit (control unit)	Wheel	sensor	Continuity	
Wheel sensor	Connector	Terminal	Connector	Terminal		_
Front LH		20	E18	1		
		19	EIO	2		
Front RH		10	E43	1		
	E125	9		2	Yes	
Rear LH	E125	8	C10	1		
		7	010	2		
Rear RH		18	C11	1		
		17	011	2		

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Instal-lation"</u>.
 NO >> Repair the circuit.

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C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

C1116 STOP LAMP SWITCH

DTC Logic

INFOID:000000011644939

[TYPE 1]

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1116	STOP LAMP SW	When stop lamp switch signal is not input when brake pedal operates.	 Harness or connector Stop lamp switch ABS actuator and electric unit (control unit) Resistor (models without ICC system) Battery power supply system

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULT

(B) With CONSULT

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

Never start the vehicle.

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

Is DTC "C1116" detected?

- YES >> Refer to <u>BRC-78, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000011644940

Regarding Wiring Diagram information, refer to BRC-49. "Wiring Diagram".

1.CONNECTOR INSPECTION

- 1. Disconnect stop lamp relay connector and ABS actuator and electric unit (control unit) connector.
- 2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

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

2. CHECK STOP LAMP SWITCH CIRCUIT

- 1. Connect stop lamp relay connector.
- 2. Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 5 and ground.

ABS actuator and ele	ctric unit (control unit)	Ground	Condition	Voltage
Connector	Terminal	Ground Condition		(Approx.)
E125	E125 5		Brake pedal depressed	Battery voltage
L125	5	—	Brake pedal released	0V

Is the inspection result normal?

NO >> GO TO 3.

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u> tion".

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

$\mathbf{3}$. CHECK STOP LAMP RELAY CIRCUIT FOR OPEN

- 1. Disconnect stop lamp relay connector.
- 2. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 5 and stop lamp relay connector E39 terminal 5.

ABS actuator and electric unit (control unit)		Stop lamp relay		Continuity	-
Connector	Terminal	Connector	Terminal	Continuity	С
E125	5	E39	5	Yes	-

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace as necessary.

4. CHECK STOP LAMP RELAY CIRCUIT FOR SHORT

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 5 and ground.

ABS actuator and ele	ABS actuator and electric unit (control unit)		Continuity	BRC
Connector	Terminal	Ground	Continuity	
E125	5	_	No	0

Is the inspection result normal?

YES >> Refer to EXL-107, "Work Flow".

NO >> Repair harness or connectors.

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C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Logic

INFOID:000000011644941

[TYPE 1]

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1120	FR LH IN ABS SOL	When a malfunction is detected in front LH ABS IN valve.	
C1122	FR RH IN ABS SOL	When a malfunction is detected in front RH ABS IN valve.	 Harness or connector ABS actuator and electric unit (control unit)
C1124	RR LH IN ABS SOL	When a malfunction is detected in rear LH ABS IN valve.	 Fusible link Battery power supply system
C1126	RR RH IN ABS SOL	When a malfunction is detected in rear RH ABS IN valve.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

(B) With CONSULT.

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

Is DTC C1120, C1122, C1124 or C1126 detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-80, "Diagnosis Procedure"</u>. NO >> Inspection End.

Diagnosis Procedure

INFOID:000000011644942

Regarding Wiring Diagram information, refer to BRC-49, "Wiring Diagram".

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 3 and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Connector Terminal		(Approx.)
E125	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 1, 2 and ground.

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

ABS actuator and electric unit (control unit)			Continuity	А
Connector	Terminal	— — Continuity		
E125	1	Ground	Yes	В
L 125	2	Giðullu	105	D

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u> C <u>tion"</u>.

NO >> Repair or replace malfunctioning components.

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C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Logic

INFOID:000000011644943

[TYPE 1]

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1121	FR LH OUT ABS SOL	When a malfunction is detected in front LH ABS OUT valve.	
C1123	FR RH OUT ABS SOL	When a malfunction is detected in front RH ABS OUT valve.	 Harness or connector ABS actuator and electric unit (control unit)
C1125	RR LH OUT ABS SOL	When a malfunction is detected in rear LH ABS OUT valve.	 Fusible link Battery power supply system
C1127	RR RH OUT ABS SOL	When a malfunction is detected in rear RH ABS OUT valve.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

()With CONSULT.

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

Is DTC C1121, C1123, C1125 or C1127 detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-82, "Diagnosis Procedure"</u>. NO >> Inspection End.

Diagnosis Procedure

INFOID:000000011644944

Regarding Wiring Diagram information, refer to BRC-49, "Wiring Diagram".

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 3 and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		(Approx.)
E125	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 1, 2 and ground.

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

ABS actuator and electric unit (control unit)			Continuity	А
Connector	Terminal	— — Continuity		
E125	1	Ground Yes	Vac	В
L 125	2	Ground	163	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u> C <u>tion"</u>.

NO >> Repair or replace malfunctioning components.

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C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

C1130 ENGINE SIGNAL

DTC Logic

INFOID:000000011644945

[TYPE 1]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULT

(B) With CONSULT.

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

Is DTC C1130 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-84, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000011644946

1.CHECK SELF-DIAGNOSTIC RESULT FOR ENGINE SYSTEM

With CONSULT.

Perform self-diagnostic result. Refer to <u>EC-72, "CONSULT Function"</u> (USA and Canada) or <u>EC-581, "CON-</u> <u>SULT Function"</u> (Mexico).

Are any ECM DTCs detected?

YES >> Refer to EC-105, "DTC Index" (USA and Canada) or EC-610, "DTC Index" (Mexico).

NO >> GO TO 2.

2.check self-diagnostic result for abs actuator and electric unit (control unit)

With CONSULT.

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

Is DTC C1130 detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "<u>Removal and Installa-</u> tion".
- NO >> Check pin terminals and connection of connectors for abnormal conditions. Repair or replace malfunctioning components.

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1140 ACTUATOR RELAY SYSTEM

DTC Logic

[TYPE 1]

А

INFOID:000000011644947

DTC	Display Item	Malfunction detected condition	Possible causes
C1140	ACTUATOR RLY	When a malfunction is detected in actuator relay.	 Harness or connector ABS actuator and electric unit (control unit) Fusible link Battery power supply system
тс с	ONFIRMATION PRO	CEDURE	
.CHE	CK SELF-DIAGNOSTI	CRESULT	
. Tur 2. Per	CONSULT. in ignition switch OFF to form self-diagnostic res <u>C1140 detected?</u> >> Proceed to diagnos >> Inspection End.		edure".
	osis Procedure		INFOID:000000011644
- 3			
1 .CON	INECTOR INSPECTION		
L.CON . Tur . Dis . Ch s the ir YES NO 2.CHE	INECTOR INSPECTION in ignition switch OFF. iconnect ABS actuator a eck connectors and term ispection result normal? >> GO TO 2. >> Repair or replace a ECK ABS ACTUATOR A	N Ind electric unit (control unit) connectors. Ininals for deformation, disconnection, looseness is necessary. ND ELECTRIC UNIT (CONTROL UNIT) BATTER	RY POWER SUPPLY
L.CON . Tur . Dis . Ch s the ir YES NO 2.CHE	INECTOR INSPECTION in ignition switch OFF. iconnect ABS actuator a eck connectors and term ispection result normal? >> GO TO 2. >> Repair or replace a ECK ABS ACTUATOR A voltage between ABS	N and electric unit (control unit) connectors. ninals for deformation, disconnection, looseness as necessary.	RY POWER SUPPLY
L.CON . Tur . Dis . Chi s the ir YES NO 2.CHE Check	INECTOR INSPECTION in ignition switch OFF. iconnect ABS actuator a eck connectors and term ispection result normal? >> GO TO 2. >> Repair or replace a ECK ABS ACTUATOR A voltage between ABS	N and electric unit (control unit) connectors. hinals for deformation, disconnection, looseness as necessary. ND ELECTRIC UNIT (CONTROL UNIT) BATTER actuator and electric unit (control unit) connec	RY POWER SUPPLY
L.CON . Tur . Dis . Chi s the ir YES NO 2.CHE Check	INECTOR INSPECTION in ignition switch OFF. iconnect ABS actuator a eck connectors and term ispection result normal? >> GO TO 2. >> Repair or replace a CK ABS ACTUATOR A voltage between ABS	N Ind electric unit (control unit) connectors. Ininals for deformation, disconnection, looseness Ins necessary. ND ELECTRIC UNIT (CONTROL UNIT) BATTER actuator and electric unit (control unit) connect unit (control unit)	RY POWER SUPPLY tor E125 terminals 3, 4 ar Voltage
L.CON . Tur . Dis . Chi s the ir YES NO 2.CHE Check	INECTOR INSPECTION in ignition switch OFF. iconnect ABS actuator a eck connectors and term ispection result normal? >> GO TO 2. >> Repair or replace a ECK ABS ACTUATOR A voltage between ABS	Ind electric unit (control unit) connectors. hinals for deformation, disconnection, looseness is necessary. ND ELECTRIC UNIT (CONTROL UNIT) BATTER actuator and electric unit (control unit) connect unit (control unit) Terminal	RY POWER SUPPLY tor E125 terminals 3, 4 ar
L.CON . Tur . Dis . Chi s the ir YES NO 2.CHE Check	INECTOR INSPECTION in ignition switch OFF. iconnect ABS actuator a eck connectors and term ispection result normal? >> GO TO 2. >> Repair or replace a CK ABS ACTUATOR A voltage between ABS	N Ind electric unit (control unit) connectors. Ininals for deformation, disconnection, looseness Ins necessary. ND ELECTRIC UNIT (CONTROL UNIT) BATTER actuator and electric unit (control unit) connect unit (control unit)	RY POWER SUPPLY tor E125 terminals 3, 4 ar Voltage
1.CON 2. Dis 3. Ch s the ir YES NO 2.CHE Check ground	INECTOR INSPECTION in ignition switch OFF. iconnect ABS actuator a eck connectors and term ispection result normal? >> GO TO 2. >> Repair or replace a ECK ABS ACTUATOR A voltage between ABS	N Ind electric unit (control unit) connectors. Ininals for deformation, disconnection, looseness Ins necessary. ND ELECTRIC UNIT (CONTROL UNIT) BATTER actuator and electric unit (control unit) connect Unit (control unit) Terminal 3 4 Ground	RY POWER SUPPLY tor E125 terminals 3, 4 ar Voltage (Approx.)

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E125	1	Ground	Yes
L 125	2	Ground	165

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u> tion".

NO >> Repair or replace malfunctioning components.

C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1142 PRESS SENSOR

DTC Logic

[TYPE 1]

А

INFOID:000000011644949

DTC	Display Item	Malfunction detected condition	Possible causes
C1142	PRESS SEN CIRCUIT	When a malfunction is detected in master cylinder pressure sensor.	 Stop lamp switch system ABS actuator and electric unit (control unit) Brake system
	ONFIRMATION PROCE		
1. Turi 2. Per	CONSULT. n ignition switch OFF to ON form self-diagnostic result. <u>C1142 detected?</u> >> Proceed to diagnosis p >> Inspection End.	N. procedure. Refer to <u>BRC-87, "Diagnosis Proce</u>	edure".
Diagno	osis Procedure		INFOID:00000001164495
4			
1.CHE	CK STOP LAMP SWITCH	SYSTEM	
		efer to <u>BRC-78, "Diagnosis Procedure"</u> .	
	spection result normal?		
YES NO	>> GO TO 2.>> Repair or replace malf	unctioning components.	
~	CK BRAKE FLUID LEAKA	C .	
	rake fluid leakage. Refer to		
	spection result normal?	<u></u> .	
YES	>> GO TO 3.		
NO	>> Repair or replace malf	unctioning components.	
	CK BRAKE PEDAL		
	rake pedal. Refer to <u>BR-7</u> ,	"Inspection".	
<u>ls the in</u> YES	spection result normal? >> GO TO 4.		
YES NO	 >> Repair or replace malf 	unctioning components.	
	CK HYDRAULIC BOOSTE		
Check h	ydraulic booster assembly	. Refer to <u>BR-10, "Inspection"</u> .	
	spection result normal?		
YES	>> GO TO 5.		
NO	>> Repair or replace malf	e .	
	CK SELF DIAGNOSTIC R		

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

< DTC/CIRCUIT DIAGNOSIS >

6. Perform self-diagnostic result.

Is DTC C1142 detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "<u>Removal and Installa-</u> tion"
- NO >> Inspection End.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1143 STEERING ANGLE SENSOR

DTC Logic

DTC DETECTION LOGIC DTC Malfunction detected condition Possible causes **Display Item** · Harness or connector · Steering angle sensor · ABS actuator and electric unit When a malfunction is detected in steering angle sen-ST ANG SEN CIRCUIT C1143 (control unit) sor Fuse Ignition power supply system · CAN communication line DTC CONFIRMATION PROCEDURE 1.CHECK SELF-DIAGNOSTIC RESULT (R)With CONSULT. Turn ignition switch OFF to ON. 1. Perform self-diagnostic result. 2. Is DTC C1143 detected? YES >> Proceed to diagnosis procedure. Refer to <u>BRC-89, "Diagnosis Procedure".</u> NO >> Inspection End. **Diagnosis** Procedure INFOID:000000011644952 Regarding Wiring Diagram information, refer to BRC-49, "Wiring Diagram". **1.**CONNECTOR INSPECTION Turn ignition switch OFF. 1. Disconnect ABS actuator and electric unit (control unit) and steering angle sensor connectors. 2. Check connectors and terminals for deformation, disconnection, looseness or damage. 3. Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace as necessary. 2.CHECK STEERING ANGLE SENSOR MOUNTING CONDITION Check steering angle sensor mounting condition. Is the inspection result normal? YES >> GO TO 3. NO >> Repair or replace malfunctioning components. 3.CHECK STEERING ANGLE SENSOR POWER SUPPLY 1. Turn ignition switch OFF. 2. Disconnect steering angle sensor connector.

3. Turn ignition switch ON.

4. Check voltage between steering angle sensor connector M54 terminal 4 and ground.

Steering angle sensor			Voltage
Connector	Connector Terminal		(Approx.)
M54	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

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C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

NO >> GO TO 4.

4.CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R connector E119.
- Check continuity between steering angle sensor connector M54 terminal 4 and IPDM E/R connector E119 terminal 35.

Steering a	Steering angle sensor		IPDM E/R	
Connector	Terminal	Connector	Terminal	Continuity
M54	4	E119	35	Yes

4. Check continuity between steering angle sensor connector M54 terminal 4 and ground.

Steering angle sensor			Continuity
Connector	Connector Terminal		Continuity
M54	4	Ground	No

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

NO >> Repair or replace malfunctioning components.

5. CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Check continuity between steering angle sensor connector M54 terminal 1 and ground.

Steering a	ngle sensor		Continuity	
Connector	Terminal		Continuity	
M54	1	Ground	Yes	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning components.

6.CHECK CAN COMMUNICATION LINE

Check "STRG BRANCH LINE CIRCUIT". Refer to <u>LAN-141, "Diagnosis Procedure"</u> (Type 1) or <u>LAN-158,</u> "Diagnosis Procedure" (Type 2).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "<u>Removal and Installa-</u> tion".

NO >> Repair or replace malfunctioning components.

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT [TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Logic

INFOID:000000011644953

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DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1144	ST ANG SEN SIGNAL	When neutral position adjustment of steering angle sensor is not complete.	 Harness or connector Steering angle sensor ABS actuator and electric unit (control unit) Incomplete neutral position ad- justment of steering angle sen- sor
	ONFIRMATION PROCE		
1. CHE	CK SELF-DIAGNOSTIC R	ESULT	
	CONSULT. n ignition switch OFF to ON	1	
	form self-diagnostic result.	•	
	C1144 detected?		adura"
YES NO	>> Proceed to diagnosis p >> Inspection End.	procedure. Refer to <u>BRC-91, "Diagnosis Proce</u>	eoure".
Diagno	osis Procedure		INFOID:000000011644954
	DSIS Procedure	TION OF STEEDING ANGLE SENSOD	INFOID:000000011644954
1.adju	JST THE NEUTRAL POSIT	TION OF STEERING ANGLE SENSOR	
1.adju	JST THE NEUTRAL POSIT	TION OF STEERING ANGLE SENSOR at of steering angle sensor. Refer to <u>BRC-61, '</u>	
1 .ADJU Perform	JST THE NEUTRAL POSIT neutral position adjustmen >> GO TO 2.	t of steering angle sensor. Refer to <u>BRC-61, '</u>	
1 .ADJU Perform	JST THE NEUTRAL POSIT neutral position adjustmen	t of steering angle sensor. Refer to <u>BRC-61, '</u>	
1.ADJU Perform 2.CHE	JST THE NEUTRAL POSIT neutral position adjustmen >> GO TO 2. CK SELF-DIAGNOSTIC RE	t of steering angle sensor. Refer to <u>BRC-61, '</u>	
1.ADJU Perform 2.CHE Perform	JST THE NEUTRAL POSIT neutral position adjustmen >> GO TO 2. CK SELF-DIAGNOSTIC RE	t of steering angle sensor. Refer to <u>BRC-61, '</u>	
1.ADJU Perform 2.CHE Perform Is DTC YES	JST THE NEUTRAL POSIT neutral position adjustmen >> GO TO 2. CK SELF-DIAGNOSTIC RE CONSULT. self-diagnostic result. <u>C1144 detected?</u> >> GO TO 3.	t of steering angle sensor. Refer to <u>BRC-61, '</u>	
1.ADJI Perform 2.CHE BWith Perform Is DTC YES NO	JST THE NEUTRAL POSIT neutral position adjustmen >> GO TO 2. CK SELF-DIAGNOSTIC RE CONSULT. self-diagnostic result. <u>C1144 detected?</u> >> GO TO 3. >> Inspection End.	at of steering angle sensor. Refer to <u>BRC-61, '</u> ESULT	
1.ADJU Perform 2.CHE Perform Is DTC YES NO 3.CHE	JST THE NEUTRAL POSIT neutral position adjustmen >> GO TO 2. CK SELF-DIAGNOSTIC RE CONSULT. self-diagnostic result. <u>C1144 detected?</u> >> GO TO 3. >> Inspection End. CK STEERING ANGLE SE	t of steering angle sensor. Refer to <u>BRC-61, '</u> ESULT	
1.ADJI Perform 2.CHE Perform Is DTC YES NO 3.CHE Check s	JST THE NEUTRAL POSIT neutral position adjustmen >> GO TO 2. CK SELF-DIAGNOSTIC RE CONSULT. self-diagnostic result. <u>C1144 detected?</u> >> GO TO 3. >> Inspection End. CK STEERING ANGLE SE	at of steering angle sensor. Refer to <u>BRC-61, '</u> ESULT	
1.ADJI Perform 2.CHE Perform Is DTC YES NO 3.CHE Check s	JST THE NEUTRAL POSIT neutral position adjustmen >> GO TO 2. CK SELF-DIAGNOSTIC RE CONSULT. self-diagnostic result. <u>C1144 detected?</u> >> GO TO 3. >> Inspection End. CK STEERING ANGLE SE teering angle sensor system spection result normal? >> Replace ABS actuator	t of steering angle sensor. Refer to <u>BRC-61, '</u> ESULT	<u>'Work Procedure"</u> .
1.ADJU Perform 2.CHE Perform Is DTC YES NO 3.CHE Check s Is the in YES	JST THE NEUTRAL POSIT neutral position adjustmen >> GO TO 2. CK SELF-DIAGNOSTIC RE CONSULT. self-diagnostic result. <u>C1144 detected?</u> >> GO TO 3. >> Inspection End. CK STEERING ANGLE SE teering angle sensor system spection result normal? >> Replace ABS actuator tion".	t of steering angle sensor. Refer to <u>BRC-61, '</u> ESULT NSOR SYSTEM m. Refer to <u>BRC-89, "Diagnosis Procedure"</u> .	<u>'Work Procedure"</u> .
1.ADJU Perform 2.CHE Perform Is DTC YES NO 3.CHE Check s Is the in	JST THE NEUTRAL POSIT neutral position adjustmen >> GO TO 2. CK SELF-DIAGNOSTIC RE CONSULT. self-diagnostic result. <u>C1144 detected?</u> >> GO TO 3. >> Inspection End. CK STEERING ANGLE SE teering angle sensor system spection result normal? >> Replace ABS actuator	t of steering angle sensor. Refer to <u>BRC-61, '</u> ESULT NSOR SYSTEM m. Refer to <u>BRC-89, "Diagnosis Procedure"</u> .	<u>'Work Procedure"</u> .

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C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

DTC Logic

INFOID:000000011644955

[TYPE 1]

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1145	YAW RATE SENSOR	 When a malfunction is detected in yaw rate signal. When yaw rate signal is not continuously received for 2 seconds or more. When side G signal is not continuously received for 2 seconds or more. When decel G signal is not continuously received for 2 seconds or more. 	 Harness or connector Yaw rate/side/decel G sensor ABS actuator and electric unit (control unit) Ignition power supply system Fuse
C1146	SIDE G-SEN CIRCUIT	When a malfunction is detected in side/decel G signal.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

(I) With CONSULT.

1. Turn ignition switch OFF to ON.

2. Perform self-diagnostic result.

Is DTC C1145 or C1146 detected?

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

Diagnosis Procedure

INFOID:000000011644956

Regarding Wiring Diagram information, refer to <u>BRC-49, "Wiring Diagram"</u>.

CAUTION:

- A malfunction in yaw rate/side/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function is OFF (VDC OFF indicator lamp is in ON status). This is not a malfunction if the status returns to normal after engine is started again. In that case, erase self-diagnosis result memory using CONSULT.
- When the engine is in running status and the vehicle is on a turntable at the entrance of parking lot or on a moving unit, SLIP indicator lamp may turn ON and "ABS" self-diagnosis may display "YAW RATE SENSOR". In this case, yaw rate sensor is not malfunctioning. The status returns to normal when the vehicle leaves the turntable or moving unit and the engine is started again. In that case, erase self-diagnosis result memory using CONSULT.

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

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

Check yaw rate/side/decel G sensor mounting condition. Refer to BRC-133, "Exploded View".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

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

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

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- 1. Turn ignition switch OFF.
- 2. Disconnect yaw rate/side/decel G sensor connector.
- 3. Turn the ignition switch ON.

4. Check voltage between yaw rate/side/decel G sensor connector M160 terminal 4 and ground.

Yaw rate/side/decel G sensor Voltage Connector Terminal (Approx.) M160 4 Ground Battery voltage the inspection result normal? YES > GO TO 4.
the inspection result normal?
 >> Repair circuit between splice and yaw rate/side/decel G sensor terminal 4. CHECK YAW RATE/SIDE/DECEL G SENSOR GROUND CIRCUIT
Turn ignition switch OFF. Check continuity between yaw rate/side/decel G sensor connector M160 terminal 1 and ground.
Yaw rate/side/decel G sensor
Connector Terminal Continuity
M160 1 Ground Yes
and electric unit (control unit) connector E125 terminals 6, 16. Yaw rate/side/decel G sensor ABS actuator and electric unit (control unit)
Connector Terminal Connector Terminal
M160 2 6 Yes 3 E125 16 Yes
Check continuity between yaw rate/side/decel G sensor connector M160 terminals 2, 3 and ground
Yaw rate/side/decel G sensor Ground Continuity
Connector Terminal
M160 2 - No
YES >> GO TO 6. NO >> Repair or replace malfunctioning components. • CHECK COMMUNICATION LINES RESISTANCE Connect ABS actuator and electric unit (control unit) connector E125.
the inspection result normal? YES >> GO TO 6. NO >> Repair or replace malfunctioning components. CHECK COMMUNICATION LINES RESISTANCE Connect ABS actuator and electric unit (control unit) connector E125. Check resistance between yaw rate/side/decel G sensor connector M160 terminals 2, 3.
the inspection result normal? YES >> GO TO 6. NO >> Repair or replace malfunctioning components. • CHECK COMMUNICATION LINES RESISTANCE Connect ABS actuator and electric unit (control unit) connector E125. Check resistance between yaw rate/side/decel G sensor connector M160 terminals 2, 3. Yaw rate/side/decel G sensor Resistance
the inspection result normal? YES >> GO TO 6. NO >> Repair or replace malfunctioning components. CHECK COMMUNICATION LINES RESISTANCE Connect ABS actuator and electric unit (control unit) connector E125. Check resistance between yaw rate/side/decel G sensor connector M160 terminals 2, 3. Yaw rate/side/decel G sensor

Is the inspection result normal?

3

< DTC/CIRCUIT DIAGNOSIS >

- YES
- >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-131, "Removal and Installation"</u>.
 >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u> NO tion".

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

C1155 BRAKE FLUID LEVEL SWITCH

DTC Logic

[TYPE 1]

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INFOID:0000000011644957

C1155 BR FLUID LEVEL LOW When brake fluid level low signal is detected. (control unit) BR FLUID LEVEL LOW When brake fluid level low signal is detected. (control unit) BR FLUID LEVEL LOW When brake fluid level low signal is detected. (control unit) BR FLUID LEVEL LOW When brake fluid level low signal is detected. (control unit) C1155 CHECK SELF-DIAGNOSTIC RESULT (control unit) (control unit) With CONSULT. Turn ignition switch OFF to ON and wait 1 minute or more. Perform self-diagnostic result. DTC C1155 detected? (control unit) (control unit) With CONSULT. Turn ignition switch OFF to ON and wait 1 minute or more. (control unit) (control unit) Diagnosis Proceed to diagnosis procedure. Refer to BRC-95. "Diagnosis Procedure". (control unit) (control unit) NO >> Inspection End. (control unit) (control unit) (control unit) .CHECK BRAKE FLUID LEVEL (control unit) (control unit) (control unit) (control unit) .CHECK BRAKE FLUID LEVEL (control unit) (control unit) (control unit) (control unit) .CHECK BRAKE FLUID LEVEL (control unit) (control unit) <	DTC	Display Item	Malfunction detected condition	Possible causes
.CHECK SELF-DIAGNOSTIC RESULT With CONSULT. . Turn ignition switch OFF to ON and wait 1 minute or more. . Perform self-diagnostic result. SDTC 21155 detected? YES >> Proceed to diagnosis procedure. Refer to BRC-95, "Diagnosis Procedure". NO >> Inspection End. Diagnosis Procedure	C1155	BR FLUID LEVEL LOW	When brake fluid level low signal is detected.	 ABS actuator and electric unit (control unit) Brake fluid level switch
 Turn ignition switch OFF to ON and wait 1 minute or more. Perform self-diagnostic result. <u>aDTC C1155 detected?</u> YES >> Proceed to diagnosis procedure. Refer to <u>BRC-95. "Diagnosis Procedure"</u>. NO >> Inspection End. Diagnosis Procedure Weat constraints of the second s				
Regarding Wiring Diagram information, refer to BRC-49, "Wiring Diagram". .CHECK BRAKE FLUID LEVEL 1 Turn the ignition switch OFF. . Check brake fluid level. Refer to BR-8, "Inspection". a the inspection result normal? YES > GO TO 2. NO >> Refill brake fluid. Refer to BR-16. "Drain and Refill". CONNECTOR INSPECTION Turn ignition switch OFF. Disconnect combination meter connector M24 and brake fluid level switch connector E21. Check connectors and terminals for deformation, disconnection, looseness or damage. a the inspection result normal? YES >> GO TO 3. NO >> Repair or replace as necessary. CHECK BRAKE FLUID LEVEL SWITCH Check brake fluid level switch. Refer to BRC-96, "Component Inspection".	1. Turi 2. Per	n ignition switch OFF to C form self-diagnostic resul <u>C1155 detected?</u> >> Proceed to diagnosis	t.	ocedure".
.CHECK BRAKE FLUID LEVEL . Turn the ignition switch OFF. . Check brake fluid level. Refer to <u>BR-8. "Inspection"</u> . a the inspection result normal? YES >> GO TO 2. NO >> Refill brake fluid. Refer to <u>BR-16. "Drain and Refill"</u> . .CONNECTOR INSPECTION . Turn ignition switch OFF. . Disconnect combination meter connector M24 and brake fluid level switch connector E21. . Check connectors and terminals for deformation, disconnection, looseness or damage. a the inspection result normal? YES >> GO TO 3. NO >> Repair or replace as necessary. .CHECK BRAKE FLUID LEVEL SWITCH Check brake fluid level switch. Refer to <u>BRC-96, "Component Inspection"</u> .	Diagno	osis Procedure		INFOID:00000001164495
CONNECTOR INSPECTION Turn ignition switch OFF. Disconnect combination meter connector M24 and brake fluid level switch connector E21. Check connectors and terminals for deformation, disconnection, looseness or damage. the inspection result normal? YES >> GO TO 3. NO >> Repair or replace as necessary. CHECK BRAKE FLUID LEVEL SWITCH Check brake fluid level switch. Refer to BRC-96, "Component Inspection".	_			
 Turn ignition switch OFF. Disconnect combination meter connector M24 and brake fluid level switch connector E21. Check connectors and terminals for deformation, disconnection, looseness or damage. the inspection result normal? YES >> GO TO 3. NO >> Repair or replace as necessary. CHECK BRAKE FLUID LEVEL SWITCH Check brake fluid level switch. Refer to <u>BRC-96, "Component Inspection"</u>. 	1 .CHE 1. Turi 2. Che	CK BRAKE FLUID LEVE n the ignition switch OFF. eck brake fluid level. Refe spection result normal? >> GO TO 2.	L r to <u>BR-8, "Inspection"</u> .	
 <u>s the inspection result normal?</u> YES >> GO TO 3. NO >> Repair or replace as necessary. CHECK BRAKE FLUID LEVEL SWITCH Check brake fluid level switch. Refer to <u>BRC-96, "Component Inspection"</u>. 	1.CHE 1. Turi 2. Che is the in YES NO	CK BRAKE FLUID LEVE n the ignition switch OFF. eck brake fluid level. Refe spection result normal? >> GO TO 2. >> Refill brake fluid. Ref	L r to <u>BR-8, "Inspection"</u> .	
CHECK BRAKE FLUID LEVEL SWITCH Check brake fluid level switch. Refer to <u>BRC-96, "Component Inspection"</u> .	1. CHE 1. Turi 2. Che is the in YES NO 2. CON 1. Turi 2. Dise	CK BRAKE FLUID LEVE n the ignition switch OFF. eck brake fluid level. Refe <u>spection result normal?</u> >> GO TO 2. >> Refill brake fluid. Ref INECTOR INSPECTION n ignition switch OFF. connect combination mete	r to <u>BR-8, "Inspection"</u> . Fer to <u>BR-16, "Drain and Refill"</u> . Fer connector M24 and brake fluid level switch	
	1.CHE 1. Turi 2. Che is the in YES NO 2.CON 1. Turi 2. Dise 3. Che is the in YES	CK BRAKE FLUID LEVE n the ignition switch OFF. eck brake fluid level. Refe spection result normal? >> GO TO 2. >> Refill brake fluid. Ref INECTOR INSPECTION n ignition switch OFF. connect combination mete eck connectors and termin spection result normal? >> GO TO 3.	r to <u>BR-8, "Inspection"</u> . Fer to <u>BR-16, "Drain and Refill"</u> . er connector M24 and brake fluid level switch hals for deformation, disconnection, loosenes	
the inspection result normal?	1 .CHE 1. Turi 2. Che is the in YES NO 2 .CON 1. Turi 2. Dise 3. Che is the in YES NO	CK BRAKE FLUID LEVE n the ignition switch OFF. eck brake fluid level. Refe ispection result normal? >> GO TO 2. >> Refill brake fluid. Ref INECTOR INSPECTION n ignition switch OFF. connect combination met- eck connectors and termin ispection result normal? >> GO TO 3. >> Repair or replace as	L r to <u>BR-8. "Inspection"</u> . Fer to <u>BR-16. "Drain and Refill"</u> . er connector M24 and brake fluid level switch hals for deformation, disconnection, loosenes necessary.	
YES >> GO TO 4.	1. CHE 1. Turn 2. Che is the in YES NO 2. CON 1. Turn 2. Disc 3. Che is the in YES NO 3. CHE Check b	CK BRAKE FLUID LEVE n the ignition switch OFF. eck brake fluid level. Refe ispection result normal? >> GO TO 2. >> Refill brake fluid. Ref INECTOR INSPECTION n ignition switch OFF. connect combination mete eck connectors and termin ispection result normal? >> GO TO 3. >> Repair or replace as CK BRAKE FLUID LEVE brake fluid level switch. Ref	L r to <u>BR-8, "Inspection"</u> . Fer to <u>BR-16, "Drain and Refill"</u> . er connector M24 and brake fluid level switch hals for deformation, disconnection, loosenes necessary. L SWITCH	
NO >> Replace reservoir tank. Refer to <u>BR-29, "Disassembly and Assembly"</u> . CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT	1. CHE 1. Turi 2. Che is the in YES NO 2. CON 1. Turi 2. Dise 3. Che is the in YES NO 3. CHE Check to is the in	CK BRAKE FLUID LEVE n the ignition switch OFF. eck brake fluid level. Refe <u>spection result normal?</u> >> GO TO 2. >> Refill brake fluid. Ref INECTOR INSPECTION n ignition switch OFF. connect combination mete eck connectors and termin <u>spection result normal?</u> >> GO TO 3. >> Repair or replace as CK BRAKE FLUID LEVE prake fluid level switch. Reference	L r to <u>BR-8, "Inspection"</u> . Fer to <u>BR-16, "Drain and Refill"</u> . er connector M24 and brake fluid level switch hals for deformation, disconnection, loosenes necessary. L SWITCH	

2. Disconnect brake fluid level switch harness connector.

- 3. Disconnect combination meter harness connector.
- 4. Check continuity between brake fluid level switch harness connector and combination meter harness connector.

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Brake fluid	level switch	Combination meter		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E21	1	M24	25	Yes

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

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning components.

5.CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

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

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning components.

Ó.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to <u>MWI-9</u>, <u>"METER SYSTEM : System Description"</u>.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "<u>Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-85, "Removal and Installation"</u>.

Component Inspection

INFOID:000000011644959

1. CHECK BRAKE FLUID LEVEL SWITCH

1. Turn the ignition switch OFF.

2. Disconnect brake fluid level switch harness connector.

3. Check continuity between terminals of brake fluid level switch.

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

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Replace reservoir tank. Refer to <u>BR-29, "Disassembly and Assembly"</u>.

C1160 DECEL G SEN SET

< DTC/CIRCUIT DIAGNOSIS >

C1160 DECEL G SEN SET

DTC Logic

А

INFOID:000000011644960

[TYPE 1]

DTC	Display Item	Malfunction detected condition	Possible causes
C1160	DECEL G SEN SET	When calibration of yaw rate/side/decel G sensor is not complete.	 Yaw rate/side/decel G sensor Harness or connector ABS actuator and electric unit (control unit) Decel G sensor calibration is not performed
	ONFIRMATION PROCE		
1. CHE	CK SELF-DIAGNOSTIC RI	ESULT	
1. Turr	CONSULT. ignition switch OFF to ON	J.	
	orm self-diagnostic result.		
YES		procedure. Refer to <u>BRC-97, "Diagnosis Proc</u>	edure".
NO	>> Inspection End.		
Diagno	sis Procedure		INFOID:000000011644961
		ION	INFOID:000000011644961
1.deci	EL G SENSOR CALIBRAT		INFOID.000000011644961
1.deci	EL G SENSOR CALIBRAT	ION . Refer to <u>BRC-63, "Work Procedure"</u> .	INFOID:000000011644961
1.DECE Perform	EL G SENSOR CALIBRAT decel G sensor calibration >> GO TO 2.	. Refer to <u>BRC-63, "Work Procedure"</u> .	INFOID:000000011644961
1.DECE Perform	EL G SENSOR CALIBRAT decel G sensor calibration	. Refer to <u>BRC-63, "Work Procedure"</u> .	INFOID:000000011644961
1.DECI Perform 2.CHEC	EL G SENSOR CALIBRAT decel G sensor calibration >> GO TO 2. CK SELF-DIAGNOSTIC RI	. Refer to <u>BRC-63, "Work Procedure"</u> .	INFOID:000000011644961
1.DECI Perform 2.CHEC BWith C Perform	EL G SENSOR CALIBRAT decel G sensor calibration >> GO TO 2. CK SELF-DIAGNOSTIC RI CONSULT. self-diagnostic result.	. Refer to <u>BRC-63, "Work Procedure"</u> .	INFOID.000000011644961
1.DECI Perform 2.CHEC BWith C Perform	EL G SENSOR CALIBRAT decel G sensor calibration >> GO TO 2. CK SELF-DIAGNOSTIC RI	. Refer to <u>BRC-63, "Work Procedure"</u> .	INFOID:000000011644961
1.DECI Perform 2.CHE0 BWith 0 Perform Is DTC 0 YES NO	EL G SENSOR CALIBRAT decel G sensor calibration >> GO TO 2. CK SELF-DIAGNOSTIC RI CONSULT. self-diagnostic result. <u>C1160 detected?</u> >> GO TO 3. >> Inspection End.	n. Refer to <u>BRC-63, "Work Procedure"</u> . ESULT	INFOID:000000011644961
1.DECI Perform 2.CHE0 BWith 0 Perform Is DTC 0 YES NO	EL G SENSOR CALIBRAT decel G sensor calibration >> GO TO 2. CK SELF-DIAGNOSTIC RI CONSULT. self-diagnostic result. <u>C1160 detected?</u> >> GO TO 3.	n. Refer to <u>BRC-63, "Work Procedure"</u> . ESULT	INFOID.000000011644961
1.DECI Perform 2.CHEC Perform Is DTC (YES NO 3.CHEC Check y	EL G SENSOR CALIBRAT decel G sensor calibration >> GO TO 2. CK SELF-DIAGNOSTIC RI CONSULT. self-diagnostic result. <u>C1160 detected?</u> >> GO TO 3. >> Inspection End. CK YAW RATE/SIDE/DECI aw rate/side/decel G senso	n. Refer to <u>BRC-63, "Work Procedure"</u> . ESULT	
1.DECI Perform 2.CHEC With C Perform Is DTC C YES NO 3.CHEC Check y Is the ins	EL G SENSOR CALIBRAT decel G sensor calibration >> GO TO 2. CK SELF-DIAGNOSTIC RI CONSULT. self-diagnostic result. <u>21160 detected?</u> >> GO TO 3. >> Inspection End. CK YAW RATE/SIDE/DECI aw rate/side/decel G senso spection result normal?	a. Refer to <u>BRC-63, "Work Procedure"</u> . ESULT EL G SENSOR SYSTEM or system. Refer to <u>BRC-92, "Diagnosis Proc</u>	edure".
1.DECI Perform 2.CHEC Perform Is DTC (YES NO 3.CHEC Check y	EL G SENSOR CALIBRAT decel G sensor calibration >> GO TO 2. CK SELF-DIAGNOSTIC RI CONSULT. self-diagnostic result. <u>21160 detected?</u> >> GO TO 3. >> Inspection End. CK YAW RATE/SIDE/DECI aw rate/side/decel G senso spection result normal?	a. Refer to <u>BRC-63, "Work Procedure"</u> . ESULT EL G SENSOR SYSTEM	edure".

C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1164, C1165 CV SYSTEM

DTC Logic

INFOID:000000011644962

[TYPE 1]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

() With CONSULT.

1. Turn ignition switch ON.

2. Perform self-diagnostic result.

Is DTC "C1164" or "C1165" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-98, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000011644963

Regarding Wiring Diagram information, refer to <u>BRC-49, "Wiring Diagram"</u>.

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminals 3, 4 and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		(Approx.)
E125	3	Ground	Detter weltere
L 125	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

${f 3}.$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 1, 2 and ground.

C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

— Continuity		ABS actuator and electric unit (control unit)		
		Terminal	Connector	
Ground Yes E	Ground	1	E125	
	Ground	2	L125	
		10		

Is the inspection result normal?

YES	>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u>	С
	tion".	

NO >> Repair or replace malfunctioning components.

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C1170 VARIANT CODING

< DTC/CIRCUIT DIAGNOSIS >

C1170 VARIANT CODING

DTC Logic

INFOID:000000011644964

[TYPE 1]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULT

() With CONSULT.

- 1. Turn ignition switch ON.
- 2. Perform self-diagnostic result.

Is DTC C1170 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-100, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000011644965

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

Replace ABS actuator and electric unit (control unit) even if other DTCs are displayed with "VARIANT COD-ING" in self diagnostic result.

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u> tion".

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

DTC DETECTION LOGIC

C1197 VACUUM SENSOR

DTC Logic

[TYPE 1]

INFOID:000000011644966

DTC	Display Item		Malfunction detected co	ondition	Possible causes
C1197	VACUUM SENSOR	When a mal	function is detected in v	vacuum sensor.	 Harness or connector Vacuum sensor (brake booster) Vacuum piping ABS actuator and electric unit (control unit)
тс сс	ONFIRMATION PI	ROCEDURE			
.CHEC	CK SELF-DIAGNO	STIC RESULT			
	CONSULT. the ignition switch	ON			
	orm self-diagnostic				
	C1197 detected?				
	>> Proceed to diag >> Inspection End		Reter to <u>BRC-101,</u>	<u>"Diagnosis Pro</u>	<u>cedure"</u> .
	sis Procedure				INFOID:000000011644967
na gire					
. Turn	CK BRAKE BOOST	OFF.			
	ck brake booster. F spection result norn		spection".		
YES	>> GO TO 2.				
•	>> Replace brake CK VACUUM PIPIN		3R-31, "Removal a	nd Installation".	
		-	dod View"		
	acuum piping. Refe				
YES	>> GO TO 3.			and the state that the state of	
)	>> Replace vacuu CK VACUUM SENS		BR-33, "Removal a	and installation"	
			ector.		
. Disc . Disc	onnect vacuum se onnect ABS actuat	nsor harness conn or and electric unit	(control unit) harn		uator and electric unit (control
Disc Disc	onnect vacuum se onnect ABS actuat	nsor harness conn or and electric unit een vacuum senso	(control unit) harn		uator and electric unit (control
Disc Disc Chee unit)	onnect vacuum se onnect ABS actuat ck continuity betwe harness connecto	nsor harness conn or and electric unit een vacuum senso r.	: (control unit) harn r harness connecto		uator and electric unit (control
. Disc 2. Disc 3. Cheo unit)	onnect vacuum ser onnect ABS actuat ck continuity betwe harness connecto	nsor harness conn or and electric unit een vacuum senso r.	(control unit) harn		uator and electric unit (control

E125

E167

1 2

3

13

32

28

Yes

RC

А

В

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Vacuun	n sensor		Continuity
Connector	Terminal	_	Continuity
	1		
E167	2	Ground	No
	3		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning components.

5.REPLACE VACUUM SENSOR

(I) With CONSULT

- T. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Replace vacuum sensor. Refer to <u>BR-31</u>, "<u>Removal and Installation</u>". CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled.

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

Is DTC "C1197" detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "<u>Removal and Installa-</u> tion".
- NO >> Inspection End.

C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1198 VACUUM SENSOR

DTC Logic

А

INFOID:000000011644968

DTC	Dis	splay Item		INIA	Ifunction detected c	ondition	Possible causes
21198	VACUUM S	GEN CIR	•	circuit. When a sho circuit.	en circuit is detected rt circuit is detected function is detected	in vacuum sensor	 Harness or connector Vacuum sensor (brake booster) ABS actuator and electric unit (control unit)
с со	NFIRMAT	TION PR		RE			
CHEC	CK SELF-D	IAGNOS	TIC RESU	JLT			
	CONSULT. the ignition	n switch (ON				
Perfo	orm self-dia	agnostic r					
	21198 detection >> Proceed		nosis proc	edure Re	fer to <u>BRC-103,</u>	"Diagnosis Pro	ocedure"
	>> Inspect				<u>Bito 100,</u>	Diagnoolo i io	<u>locute</u> .
agno	sis Proc	edure					INFOID:00000001164496
gardin	ıg Wiring D	iagram in	nformation	, refer to E	3RC-49, "Wiring	Diagram".	
gardin	ıg Wiring D	iagram ir	nformation	, refer to <u>F</u>	3RC-49, "Wiring	<u>Diagram"</u> .	
-		-		_	3RC-49, "Wiring	<u>Diagram"</u> .	
CHEC	CK VACUU	M SENSO	OR CIRCL		3RC-49, "Wiring	<u>Diagram"</u> .	
CHEC Turn Disco	CK VACUU	M SENSO	OR CIRCL OFF. sor harnes	JIT ss connec	tor.		
CHEC Turn Disco	CK VACUU the ignition onnect vac onnect ABS	M SENS(n switch (ouum sens S actuato	OR CIRCL OFF. sor harnes	JIT ss connec stric unit (c	tor. control unit) harn	less connector.	uator and electric unit (contro
CHEC Turn Disco Disco Cheo	CK VACUU the ignition onnect vac onnect ABS	M SENS(n switch (ouum sense) S actuato ty betwee	OR CIRCL OFF. sor harnes or and elec en vacuum	JIT ss connec stric unit (c	tor. control unit) harn	less connector.	uator and electric unit (contro
CHEC Turn Disco Disco Chec unit)	CK VACUU the ignition onnect vac onnect ABS ck continuit harness co	M SENS(n switch (uum sens S actuato ty betwee onnector.	OR CIRCL OFF. sor harnes or and elec en vacuum	JIT ss connec stric unit (c n sensor h	tor. control unit) harn arness connect	less connector.	uator and electric unit (contro
CHEC Turn Disco Disco Cheo unit)	CK VACUU the ignition onnect vac onnect ABS ck continuit harness co acuum senso	M SENS(n switch (uum sens S actuato ty betwee onnector.	OR CIRCL OFF. sor harnes or and elec en vacuum	JIT ss connec etric unit (c n sensor h	tor. control unit) harn	less connector.	uator and electric unit (contro
CHEC Turn Disco Disco Chec unit)	CK VACUU the ignition onnect vac onnect ABS ck continuit harness co acuum senso	M SENSO n switch (uum sens S actuato ty betwee onnector.	OR CIRCL OFF. sor harnes or and elec en vacuum	JIT ss connec etric unit (c n sensor h	tor. control unit) harn arness connect c unit (control unit)	less connector. or and ABS act	uator and electric unit (contro
CHEC Turn Disco Disco Chec unit)	CK VACUU the ignition onnect vac onnect ABS ck continuit harness co facuum senso	M SENSO n switch (ouum sens S actuato s actuato ty betwee connector.	OR CIRCL OFF. sor harnes or and elec en vacuum	JIT ss connect tric unit (con sensor h	tor. control unit) harn arness connect c unit (control unit) Terminal	less connector. or and ABS act	uator and electric unit (contro
CHEC Turn Disco Disco Chec unit)	CK VACUU the ignition onnect vac onnect ABS ck continuit harness co facuum senso	M SENSO n switch (uum sens S actuato ty betwee onnector.	OR CIRCL OFF. sor harnes or and elec en vacuum ABS actuato Connec	JIT ss connect tric unit (con sensor h	tor. control unit) harn aarness connecto c unit (control unit) Terminal 13	less connector. or and ABS act Continuity	uator and electric unit (contro
CHEC Turn Disco Disco Chec unit) Va Connec	CK VACUU the ignition onnect vac onnect ABS ck continuit harness co facuum senso ctor Ten	M SENSO n switch (suum sens S actuato ty betwee onnector. r minal 1 2 3	OR CIRCL OFF. sor harnes or and elec en vacuum ABS actuato Connec E125	JIT ss connec otric unit (c n sensor h or and electri	tor. control unit) harn arness connected c unit (control unit) Terminal 13 32	ess connector. or and ABS act Continuity Yes	uator and electric unit (contro
CHEC Turn Disco Disco Chec unit) Va Connec	CK VACUU the ignition onnect vac onnect ABS ck continuit harness co facuum senso ctor Ten	M SENSO n switch (suum sens S actuato ty betwee onnector.	OR CIRCL OFF. sor harnes or and elec en vacuum ABS actuato Connec E125	JIT ss connec otric unit (c n sensor h or and electri	tor. control unit) harn arness connected c unit (control unit) Terminal 13 32 28 arness connected	ess connector. or and ABS act Continuity Yes or and ground.	uator and electric unit (contro
CHEC Turn Disco Disco Chec unit) Va Connec E167 Chec	CK VACUU the ignition onnect vac onnect ABS ck continuit harness co acuum senso ctor Tel ck continuit	M SENSO n switch (ouum sense S actuato ty betweet onnector.	OR CIRCL OFF. sor harnes or and elec en vacuum ABS actuato Connec E125	JIT ss connec otric unit (c n sensor h or and electri	tor. control unit) harn arness connected c unit (control unit) Terminal 13 32 28 arness connected	ess connector. or and ABS act Continuity Yes	uator and electric unit (contro
CHEC Turn Disco Disco Chec unit) Va Connec E167 Chec	CK VACUU the ignition onnect vac onnect ABS ck continuit harness co acuum senso ctor Ten ck continuit	M SENSO n switch (suum senses S actuato by betweet onnector. rr rminal 1 2 3 cy betweet sensor Terr	OR CIRCL OFF. sor harnes or and elec en vacuum ABS actuato Connec E125 en vacuum	JIT ss connec otric unit (c n sensor h or and electri	tor. control unit) harn arness connected c unit (control unit) Terminal 13 32 28 arness connected	ess connector. or and ABS act Continuity Yes or and ground.	uator and electric unit (contro
CHEC Turn Disco Disco Chec unit) Va Connec E167 Chec	CK VACUU the ignition onnect vac onnect ABS ck continuit harness co acuum senso ctor Ten ck continuit	M SENSO n switch (uum sens S actuato ty betwee onnector. nr rminal 1 2 3 cy betwee sensor Terr	OR CIRCL OFF. sor harnes or and elec en vacuum ABS actuato Connec E125 en vacuum	JIT ss connect tric unit (con sensor h pr and electri tor	tor. control unit) harn arness connected c unit (control unit) Terminal 13 32 28 arness connected	ess connector. or and ABS act Continuity Yes or and ground.	uator and electric unit (contro

NO >> Repair or replace malfunctioning components.

2.CHECK TERMINAL

C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

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

3.REPLACE VACUUM SENSOR

(B) With CONSULT

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Replace vacuum sensor. Refer to <u>BR-31</u>, "<u>Removal and Installation</u>". CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled.

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

Is DTC "C1198" detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "<u>Removal and Installa-</u> tion".
- NO >> Inspection End.

C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

C1199 BRAKE BOOSTER

DTC Logic

INFOID:0000000011644970

[TYPE 1]

DTC	Display Item	ſ	Malfunction detected condition	Possible causes
C1199	BRAKE BOOSTER		e booster vacuum is approx. 0 kPa (0 mm- engine running.	 Harness or connector Vacuum sensor (brake booster) Vacuum piping ABS actuator and electric unit (control unit)
отс со	ONFIRMATION PR	ROCEDURE		
.CHE	CK SELF-DIAGNO	STIC RESULT		
I. Turr 2. Perf	CONSULT. the ignition switch orm self-diagnostic <u>C1199 detected?</u> >> Proceed to diag >> Inspection End.	result. gnosis procedure. I	Refer to <u>BRC-105, "Diagnosis Pro</u>	cedure".
	sis Procedure			INFOID:00000001164497
Jugit				NW 012.00000001104401
Regardii	ng Wiring Diagram i	information, refer to	o BRC-49, "Wiring Diagram".	
. Turr	CK BRAKE BOOST	ER OFF.		
1 .CHE	CK BRAKE BOOST the ignition switch ck brake booster. R	ER OFF. Refer to <u>BR-10, "Ins</u>		
.CHEC .Turr .Che s the ins YES NO	CK BRAKE BOOST the ignition switch ck brake booster. R spection result norn >> GO TO 2. >> Replace brake	ER OFF. Refer to <u>BR-10, "Ins</u> nal? booster. Refer to <u>B</u>		
1.CHE . Turr 2. Che s the ins YES NO 2.CHE Check v	CK BRAKE BOOST the ignition switch ck brake booster. R spection result norn >> GO TO 2. >> Replace brake CK VACUUM PIPIN acuum piping. Refe	ER OFF. Refer to <u>BR-10, "Ins</u> nal? booster. Refer to <u>B</u> IG	spection". 3R-31, "Removal and Installation".	
1.CHEC . Turr 2. Che s the ins YES NO 2.CHEC Check v s the ins YES NO	CK BRAKE BOOST the ignition switch ck brake booster. R spection result norm >> GO TO 2. >> Replace brake CK VACUUM PIPIN acuum piping. Refe spection result norm >> GO TO 3. >> Replace vacuum	ER OFF. Refer to <u>BR-10, "Ins</u> nal? booster. Refer to <u>B</u> IG rr to <u>BR-33, "Explor</u> nal? m piping. Refer to <u>1</u>	spection". 3R-31, "Removal and Installation".	
1.CHEC . Turr 2. Che s the ins YES NO 2.CHEC Check v. s the ins YES NO 3.CHEC 1. Disc 2. Disc 3. Che	CK BRAKE BOOST the ignition switch ck brake booster. R spection result norm >> GO TO 2. >> Replace brake CK VACUUM PIPIN acuum piping. Refe spection result norm >> GO TO 3. >> Replace vacuum CK VACUUM SENS connect vacuum ser connect ABS actuat ck continuity betwe	ER OFF. Refer to <u>BR-10, "Ins</u> nal? booster. Refer to <u>B</u> IG r to <u>BR-33, "Explor</u> nal? m piping. Refer to <u>B</u> SOR CIRCUIT nsor harness conne or and electric unit	spection". 3R-31, "Removal and Installation". ded View". BR-33, "Removal and Installation"	
LCHE Turr Che sthe ins YES NO Check v sthe ins YES NO LCHE NO LCHE Check v sthe ins Sthe ins Sthe ins Check v Sthe ins Sthe ins Check v Sthe ins Sthe ins Sth	CK BRAKE BOOST the ignition switch ck brake booster. R spection result norn >> GO TO 2. >> Replace brake CK VACUUM PIPIN acuum piping. Refe spection result norn >> GO TO 3. >> Replace vacuum CK VACUUM SENS connect vacuum ser connect ABS actuat	ER OFF. Refer to <u>BR-10, "Ins</u> nal? booster. Refer to <u>B</u> IG r to <u>BR-33, "Explor</u> nal? m piping. Refer to <u>B</u> SOR CIRCUIT nsor harness conne or and electric unit	spection". 3R-31, "Removal and Installation". ded View". BR-33, "Removal and Installation" ector. : (control unit) harness connector.	
1.CHEC . Turr 2. Che s the ins YES NO 2.CHEC Check vist s the ins YES NO 3.CHEC 1. Disc 2. Disc 3. Che unit	CK BRAKE BOOST the ignition switch ck brake booster. R spection result norm >> GO TO 2. >> Replace brake CK VACUUM PIPIN acuum piping. Refe spection result norm >> GO TO 3. >> Replace vacuum CK VACUUM SENS connect vacuum ser connect ABS actuat ck continuity betwe	ER OFF. Refer to <u>BR-10, "Ins</u> nal? booster. Refer to <u>B</u> IG or to <u>BR-33, "Explor</u> nal? m piping. Refer to <u>B</u> SOR CIRCUIT nsor harness conne or and electric unit een vacuum sensor r.	spection". 3R-31, "Removal and Installation". ded View". BR-33, "Removal and Installation" ector. : (control unit) harness connector.	

E125

E167

1 2

3

13

32

28

Yes

А

C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

Vacuun	n sensor		Continuity
Connector	Terminal	—	Continuity
	1		
E167	2	Ground	No
	3		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning components.

5.REPLACE VACUUM SENSOR

(B) With CONSULT

- T. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Replace vacuum sensor. Refer to <u>BR-31</u>, "<u>Removal and Installation</u>". CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled.

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

Is DTC "C1199" detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "<u>Removal and Installa-</u> tion".
- NO >> Inspection End.

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

DTC DETECTION LOGIC

C119A VACUUM SENSOR

DTC Logic

[TYPE 1]

INFOID:000000011644972

	DIS	play Item	Malfuncti	ion detected condition	Possible causes
C119A	VACUUM S	EN VOLT	When a malfunction age of vacuum sens	is detected in supply power volt- or.	 Harness or connector Vacuum sensor (brake booster) ABS actuator and electric unit (control unit)
TC CO	NFIRMAT	ION PROCE	DURE		
.CHEC	CK SELF-D	IAGNOSTIC F	RESULT		
 DWith (CONSULT.				
. Turn	the ignition	n switch ON.			
	orm self-dia	ignostic result.			
			nrocedure Refer t	o <u>BRC-107, "Diagnosis Pro</u>	cedure"
	>> Inspecti			<u>Dito 107, Diagnosis 110</u>	
iagno	sis Proce	edure			INFOID:00000001164497
- 0 -					
egardin	ng Wiring Di	iagram informa	ation, refer to <u>BRC</u>	-49, "Wiring Diagram".	
.CHEC		M SENSOR P	OWER SUPPLY		
. Turn	the ignition				
. ium		n switch OFF.			
. Disco	onnect vac	uum sensor ha	arness connector.	connector and ground	
. Disco	onnect vac	uum sensor ha		connector and ground.	
. Disco	onnect vac	uum sensor ha between vacuu		-	
. Disco . Cheo	onnect vac ck voltage t	uum sensor ha between vacuu		Connector and ground.	
. Disco . Cheo Con	onnect vac ck voltage k Vacuum	uum sensor ha between vacuu sensor		Voltage	
. Disco . Chec Con	onnect vac ck voltage t Vacuum inector	uum sensor ha between vacuu sensor Terminal 3	um sensor harness	Voltage (Approx.)	
. Disco . Chec Com E . Turn CAU	Vacuum Vacuum 167 the ignitior	uum sensor ha between vacuu sensor Terminal 3 n switch ON.	um sensor harness	Voltage (Approx.)	
Disco Con Con E . Turn CAU Neve	Vacuum vacuum 167 the ignition ITION: er start eng	uum sensor ha between vacuu sensor Terminal 3 n switch ON. gine.	um sensor harness	Voltage (Approx.) 0 V	
Disco Con Con E . Turn CAU Neve	Vacuum vacuum 167 the ignition ITION: er start eng	uum sensor ha between vacuu sensor Terminal 3 n switch ON. gine.	um sensor harness	Voltage (Approx.)	
Disco Con Con E . Turn CAU Neve	Vacuum vacuum 167 the ignition ITION: er start eng	uum sensor ha between vacuu sensor Terminal 3 n switch ON. gine. between vacuu	um sensor harness	Voltage (Approx.) 0 V connector and ground.	
Disco Con E Turn CAU Neve	Vacuum Vacuum Inector 167 the ignition ITION: er start eng ck voltage b	uum sensor ha between vacuu sensor Terminal 3 n switch ON. gine. between vacuu	um sensor harness	Voltage (Approx.) 0 V	
. Disco Con E . Turn CAU Neve . Chec	vacuum vacuum inector i167 the ignitior JTION: er start eng ck voltage b Vacuum	uum sensor ha between vacuu sensor Terminal 3 n switch ON. gine. between vacuu sensor	um sensor harness	Voltage (Approx.) 0 V connector and ground.	
. Disco Con E . Turn CAU Neve . Chec	Vacuum vacuum inector i167 the ignitior TION: er start eng ck voltage to Vacuum inector i167	uum sensor ha between vacuu sensor Terminal 3 n switch ON. gine. between vacuu sensor Terminal	um sensor harness Ground um sensor harness 	Voltage (Approx.) 0 V connector and ground. Voltage (Approx.)	
Disco Con E Turn CAU Neve Con E Sthe ins YES	Vacuum vacuum inector i167 the ignition ITION: er start eng ck voltage b Vacuum inector i167 >> GO TO	uum sensor ha between vacuu sensor Terminal 3 n switch ON. gine. between vacuu sensor Terminal 3 sult normal? 3.	um sensor harness Ground um sensor harness 	Voltage (Approx.) 0 V connector and ground. Voltage (Approx.)	
Disco Con E Turn CAU Neve Con E Sthe ins YES	Vacuum vacuum inector i167 the ignition JTION: er start eng ck voltage b Vacuum inector i167 spection res >> GO TO >> GO TO	uum sensor ha between vacuu sensor Terminal 3 n switch ON. gine. between vacuu sensor Terminal 3 sult normal? 3. 2.	um sensor harness Ground um sensor harness Ground	Voltage (Approx.) 0 V connector and ground. Voltage (Approx.) 4.75 V – 5.25 V	
Disco Con E Turn CAU Neve Con E Sthe ins YES	Vacuum vacuum inector i167 the ignition JTION: er start eng ck voltage b Vacuum inector i167 spection res >> GO TO >> GO TO	uum sensor ha between vacuu sensor Terminal 3 n switch ON. gine. between vacuu sensor Terminal 3 sult normal? 3. 2.	um sensor harness Ground um sensor harness 	Voltage (Approx.) 0 V connector and ground. Voltage (Approx.) 4.75 V – 5.25 V	

Check continuity between vacuum sensor harness connector and ABS actuator and electric unit (control З. unit) harness connector.

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В

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Vacuun	n sensor	ABS actuator and ele	ectric unit (control unit)	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E167	3	E125	28	Yes

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

Vacuun	n sensor		Continuity
Connector	Terminal		Continuity
E167	3	Ground	No

Is the inspection result normal?

YES >> Perform diagnosis of ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-72, "Diagnosis Procedure"</u>.

NO >> Repair or replace malfunctioning components.

 $\mathbf{3}$.check vacuum sensor ground circuit

1. Turn the ignition switch OFF.

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

Vacuur	n sensor		Continuity
Connector	Terminal		Continuity
E167	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

4.CHECK TERMINAL

Check vacuum sensor pin terminals for damage or loose connection with harness connector.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u> tion".

NO >> Repair or replace malfunctioning components.

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

U1000 CAN COMM CIRCUIT

Description

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U1000	CAN COMM CIRCUIT	When CAN communication signal is not continuously received for 2 seconds or more	CAN communication system mal- function
Diagno	osis Procedure		INFOID:000000011644976
1.сне	CK SELF-DIAGNOSTIC RE	SULT	
I. Turr 2. Perf <u>s DTC l</u>	CONSULT. ignition switch ON. form self-diagnostic result. J1000 detected?		
YES NO	>> Proceed to diagnosis pr >> Refer to <u>GI-47, "Intermi</u>	ocedure. Refer to <u>LAN-21, "Trouble Diagnosi ttent Incident"</u> .	<u>s Flow Chart"</u> .

[TYPE 1]

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INFOID:0000000011644974

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

PARKING BRAKE SWITCH

Description

Transmits the parking brake switch signal to the combination meter.

Component Function Check

1.COMBINATION METER INPUT SIGNAL

1. Start engine.

2. Monitor BRAKE W/L in DATA MONITOR while applying and releasing the parking brake.

ConditionCONSULTParking brake applied: ONParking brake released: OFF

>> Inspection End.

Diagnosis Procedure

Regarding Wiring Diagram information, refer to MWI-31, "Wiring Diagram".

1.CHECK PARKING BRAKE SWITCH CIRCUIT

1. Disconnect combination meter harness connector M24 and parking brake switch harness connector E52.

2. Check continuity between combination meter harness connector M24 terminal 12 and parking brake switch harness connector E52 terminal 1.

Combina	Combination meter		eter Parking brake switch	
Connector	Terminal	Connector	Terminal	Continuity
M24	12	E52	1	Yes

3. Check continuity between combination meter harness connector M24 terminal 12 and ground.

Combination meter			Continuity	
Connector	Terminal Ground		Continuity	
M24	12		No	

Is the inspection result normal?

YES >> Inspection End.

NO >> Repair or replace harness or connectors.

Component Inspection

INFOID:000000011644980

1. CHECK PARKING BRAKE SWITCH

Check continuity between parking brake switch terminal 1 and switch case ground.

Component	Terminal	Condition	Continuity
Parking brake switch	1	Parking brake applied	Yes
Parking brake switch		Parking brake released	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace parking brake switch. Refer to <u>PB-7, "Exploded View"</u>.

BRC-110

2015 Pathfinder

INFOID:000000011644977

INFOID:000000011644978

VDC OFF SWITCH

	VD	C OFF	SWITCH		
< DTC/CIRCUIT DIAG	NOSIS >				[TYPE 1]
VDC OFF SWIT	СН				
Component Funct	ion Check				INFOID:000000011644981
1.CHECK VDC OFF S	WITCH OPERATION				
Check that VDC OFF ir	ndicator lamp in combin	nation me	eter turns ON	/OFF when VDC OFF	switch is operated.
s the inspection result					
YES >> Inspection NO >> Proceed to	diagnosis procedure. F	Refer to	<u> 3RC-111, "Di</u>	agnosis Procedure".	
Diagnosis Proced	ure				INFOID:000000011644982
Regarding Wiring Diag	ram information, refer to	o <u>BRC-49</u>	9, "Wiring Dia	agram".	
1.CONNECTOR INSP	ECTION				
 Turn ignition switch Disconnect ABS a 	n OFF. ctuator and electric unit	t (control	unit) connec	ctor E125 and VDC O	
M71.	and terminals for deform				
s the inspection result		mation, u	IISCONNECTION		je.
YES >> GO TO 2.					
NO >> Repair or replace as necessary. 2.CHECK VDC OFF SWITCH					
	h. Refer to <u>BRC-112, "C</u>	Compone	nt Inspection	"	
Is the inspection result		2011100110		L.	
YES >> GO TO 3.					
NO >> Replace VI 3.CHECK VDC OFF S	DC OFF switch.				
With CONSULT. Connect ABS actu 	ator and electric unit ((control u	unit) connect	or E125 and VDC O	FF switch connector
M71. 2. Turn ignition switch	n ON				
	R" select "OFF SW" and	d check \	VDC OFF sw	itch signal.	
	Condition			DATA MONITOR	
VDC OFF switch is pressed	d and released			On	
VDC OFF switch is pressed	d and released again			Off	
Is the inspection result					
YES >> Refer to BI NO >> GO TO 4.	RC-58, "Work Flow".				
4. CHECK VDC OFF S	WITCH CIRCUIT				
1. Turn ignition switch					
	ctuator and electric unit	t (control	unit) connec	ctor E125 and VDC O	FF switch connector
3. Check continuity b	etween ABS actuator a onnector M71 terminal		tric unit (con	trol unit) connector E	125 terminal 30 and
ABS actuator and ele	ectric unit (control unit)		VDC OF	FF switch	
Connector	Terminal	Co	onnector	Terminal	Continuity
	1	1			

E125

M71

1

30

Yes

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

4. Check continuity between ABS actuator and electric unit (control unit) connector terminal E125 terminal 30 and ground.

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal		Continuity	
E125	30	Ground	No	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning components.

5.CHECK VDC OFF SWITCH GROUND CIRCUIT

Check continuity between VDC OFF switch connector M71 terminal 2 and ground.

VDC OFF switch			Continuity	
Connector	Terminal		Continuity	
M71	2	Ground	Yes	

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace malfunctioning components.

Component Inspection

1.CHECK VDC OFF SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect VDC OFF switch connector.

3. Check continuity between terminals of VDC OFF switch connector.

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace VDC OFF switch.

Revision: September 2014

ABS WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >	[TYPE 1]
ABS WARNING LAMP	
Component Function Check	DID:0000000011644984
1. CHECK ABS WARNING LAMP FUNCTION	
Check that ABS warning lamp in combination meter turns ON for approximately 2 seconds after igr is turned ON.	iition switch
<u>Is the inspection result normal?</u> YES >> Inspection End. NO >> Proceed to diagnosis procedure. Refer to <u>BRC-113</u> , " <u>Diagnosis Procedure</u> ".	
Diagnosis Procedure	DID:0000000011644985
1.PERFORM THE SELF-DIAGNOSIS	
With CONSULT. Perform self-diagnostic result.	
<u>Are any DTCs detected?</u> YES >> Refer to <u>BRC-47, "DTC Index"</u> . NO >> GO TO 2.	
2. CHECK COMBINATION METER	
Check if indication and operation of combination meter are normal. Refer to <u>MWI-9</u> , " <u>METER SYS</u> tem Description".	<u>TEM : Sys-</u>
<u>Is the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal a</u>	nd Installa-
 NO >> Replace combination meter. Refer to <u>MWI-85, "Removal and Installation"</u>. 	<u>na motana</u>

BRAKE WARNING LAMP

Component Function Check

1.CHECK BRAKE WARNING LAMP FUNCTION (1)

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-114</u>, "Diagnosis Procedure".

2.CHECK BRAKE WARNING LAMP FUNCTION (2)

Check that brake warning lamp in combination meter turns ON/OFF when parking brake is operated. Is the inspection result normal?

YES >> Inspection End.

NO >> Check parking brake switch system. Refer to <u>BRC-110, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000011644987

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT.
 Perform self-diagnostic result.

Are any DTCs detected?

YES >> Refer to <u>BRC-47, "DTC Index"</u>.

NO >> GO TO 2.

2. CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to <u>MWI-9</u>, <u>"METER SYSTEM : System Description"</u>.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-85, "Removal and Installation"</u>.

VDC OFF INDICATOR LAMP

VDC OFF INDICATOR LAMP	
< DTC/CIRCUIT DIAGNOSIS > [TYPE 1]	_
VDC OFF INDICATOR LAMP	A
Component Function Check	
1. CHECK VDC OFF INDICATOR LAMP FUNCTION (1)	В
Check that VDC OFF indicator lamp in combination meter turns ON for approximately 2 seconds after ignition	I
switch is turned ON. <u>Is the inspection result normal?</u>	С
YES >> GO TO 2.	
NO >> Proceed to diagnosis procedure. Refer to <u>BRC-115, "Diagnosis Procedure"</u> . 2.CHECK VDC OFF INDICATOR LAMP FUNCTION (2)	D
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.	E
NO >> Check VDC OFF switch. Refer to <u>BRC-111, "Diagnosis Procedure"</u> .	
Diagnosis Procedure	BRC
1.PERFORM THE SELF-DIAGNOSIS	
With CONSULT. Derform cells diagnostic result	G
Perform self diagnostic result. <u>Are any DTCs detected?</u>	Н
YES >> Refer to <u>BRC-47, "DTC Index"</u> . NO >> GO TO 2.	11
2. CHECK COMBINATION METER	I
Check if indication and operation of combination meter are normal. Refer to MWI-9, "METER SYSTEM : Sys-	
tem Description". Is the inspection result normal?	J
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u> , "Removal and Installa-	:
tion". NO >> Replace combination meter. Refer to <u>MWI-85, "Removal and Installation"</u> .	K
	L
	M
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SLIP INDICATOR LAMP

Component Function Check

1. CHECK SLIP INDICATOR LAMP FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-116. "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT. Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to <u>BRC-47, "DTC Index"</u>. NO >> GO TO 2.

2. CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to <u>MWI-9</u>, <u>"METER SYSTEM : System Description"</u>.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-85, "Removal and Installation"</u>.

INFOID:000000011644990

APPLICATION NOTICE

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS APPLICATION NOTICE

Application Notice

INFOID:000000011645024

Service information	Remarks	C
TYPE 1	VDC/TCS/ABS	C
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS	

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[TYPE 1]

VDC/TCS/ABS

< SYMPTOM DIAGNOSIS >

VDC/TCS/ABS

INFOID:000000011644992

[TYPE 1]

Symptom Table

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

Symptom	Check item	Reference
	Brake force distribution	
Excessive ABS function operation fre- quency	Looseness of front and rear axle	BRC-119, "Diagno- sis Procedure"
4	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-120, "Diag-
	Make sure the braking force is sufficient when the ABS is not operating.	nosis Procedure"
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-121, "Diag- nosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-122, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-123, "Diag-
occurs (Note 2)	ABS actuator and electric unit (control unit)	nosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS con- trol	ТСМ	<u>BRC-124, "Diag-</u> nosis Procedure"
	ECM	<u></u>

NOTE:

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

EXCESSIVE OPERATION FREQUENCY

EXCESSIVE OPERATION FREQUENCT	
< SYMPTOM DIAGNOSIS >	[TYPE 1]
EXCESSIVE OPERATION FREQUENCY	
Description	D:0000000011644993
VDC function, TCS function, ABS function, EBD function or hill start assist function operates in operation frequency.	excessive
Diagnosis Procedure	D:0000000011644994
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: Refer to <u>FAX-6, "Inspection"</u>. 	
Rear axle: Refer to <u>RAX-5, "Inspection"</u> .	
Is the inspection result normal?	
YES >> GO TO 3.	
NO >> Repair or replace malfunctioning components.	
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 <u>BRC-126</u>, "<u>Removal and Installation - Front Wheel Sens</u> 	or"
 Rear wheel sensor: Refer to <u>BRC-128</u>, <u>Removal and Installation - Front wheel Sensor</u> Rear wheel sensor: Refer to <u>BRC-128</u>, <u>"Removal and Installation - Rear Wheel Sensor</u> 	<u>or</u> . or".
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 <u>BRC-130</u>, "Removal and Installation - Front Sensor Rotor Boar sensor rotor: Refer to <u>BRC-130</u>, "Removal and Installation - Front Sensor Rotor" 	
Rear sensor rotor: Refer to <u>BRC-130. "Removal and Installation - Rear Sensor Rotor"</u> 5. CHECK WARNING LAMP TURNS OFF	
Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn OFF approx. 1 se key switch is turned ON and stay in OFF status during driving.	cond after
CAUTION: Brake warning lamp turns ON when parking brake is operated (parking brake switch is ON) fluid is less than the specified level (brake fluid level switch is ON).) or brake
Is the inspection result normal?	
YES >> Inspection End.	
NO >> Perform self-diagnosis result. Refer to <u>BRC-36, "CONSULT Function"</u> .	

UNEXPECTED BRAKE PEDAL REACTION

< SYMPTOM DIAGNOSIS >

UNEXPECTED BRAKE PEDAL REACTION

Description

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

Diagnosis Procedure

1.CHECK FRONT AND REAR AXLE

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

• Front axle: Refer to <u>FAX-6, "Inspection"</u>.

Rear axle: Refer to <u>RAX-5, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning components.

2. CHECK DISC ROTOR

Check disc rotor runout.

· Front: Refer to BR-11, "DISC ROTOR : Inspection".

· Rear: Refer to BR-13, "DISC ROTOR : Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Refinish the disc rotor.

3.CHECK BRAKE FLUID LEAKAGE

Check fluid leakage. Refer to <u>BR-8, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

4.CHECK BRAKE PEDAL

Check brake pedal. Refer to <u>BR-7, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust brake pedal. Refer to <u>BR-15. "Adjustment"</u>.

5.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check 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 >> Inspection End.

NO >> Check brake system.

INFOID:000000011644996

THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS > [TYPE 1]	
THE BRAKING DISTANCE IS LONG	А
Description	A
Brake stopping distance is long when ABS function is operated.	В
Diagnosis Procedure	
CAUTION: Brake stopping distance on slippery roads like a rough road, gravel road or snowy road may become longer when ABS is operated than when ABS is not operated. 1.CHECK BRAKING FORCE	C
Check brake force using a brake tester.	D
<u>Is the inspection result normal?</u> YES >> GO TO 2.	Е
NO >> Check brake system.	
2.CHECK BRAKE PERFORMANCE	BRC
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?	G
YES >> Inspection End. NO >> Check brake system.	
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ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

ABS FUNCTION DOES NOT OPERATE

Description

VDC function, TCS function, ABS function, EBD function or hill start assist function does not operate.

Diagnosis Procedure

INFOID:000000011645000

INFOID:000000011644999

CAUTION:

- VDC function, TCS function, ABS function, EBD function and hill start assist function never operate when the vehicle speed is 10 km/h (6.2 MPH) or less. However, hill start assist function operates when the vehicle speed is 0 km/h (0 MPH) (the vehicle is in stop status).
- VDC function and TCS function never operate when VDC OFF switch is operated (when VDC OFF indicator lamp turns ON).

1.CHECK ABS WARNING LAMP

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

CAUTION:

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

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Perform self-diagnosis result. Refer to <u>BRC-36, "CONSULT Function"</u>.

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS > [TYPE 1]	I
BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS	-
Description	1
 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	2
1.SYMPTOM CHECK 1	B
Check that there are pedal vibrations when the engine is started.	-
Do vibrations occur?	
YES >> GO TO 2.	
NO >> Check brake pedal. Refer to <u>BR-7, "Inspection"</u> .	

2.SYMPTOM CHECK 2

Check that motor sound from ABS actuator occurs when the engine starts.

Does	the	oper	ation	sound	occur?	

YES >> GO TO 3.

NO >> Perform self-diagnosis result. Refer to <u>BRC-36. "CONSULT Function"</u>.

3.SYMPTOM CHECK 3

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

Does the symptom occur?

- YES >> Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit).
- NO >> Inspection End.

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VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Description

The vehicle jerks when VDC function, TCS function, ABS function, EBD function or hill start assist function operates.

Diagnosis Procedure

1.CHECK SYMPTOM

Check that the vehicle jerks when VDC function, TCS function, ABS function, EBD function or hill start assist function operates.

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 2.

2. PERFORM THE SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis result. Refer to <u>BRC-36, "CONSULT Function"</u>.

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-47, "DTC Index"</u>.

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.
- Connect harness connector and perform self-diagnosis result. Refer to <u>BRC-36, "CONSULT Function"</u>.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace connector terminal.

4.CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

With CONSULT

Perform self-diagnosis result for "ENGINE" and "TRANSMISSION".

Is any DTC detected?

- YES >> Check the DTC.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "<u>Removal and Installa-</u> tion".

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< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

A

INFOID:000000011645005

[TYPE 1]

Symptom	Result	
Brake pedal slightly vibrates and operation sound (motor sound and sound from suspen- sion) occurs when VDC function, TCS function, ABS function, EBD function or hill start as- sist function operates.	This is not a malfunction, because it is	
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.	caused by VDC function, TCS function, ABS function, EBD function and hill start assist function that are normally operat- ed.	
Brake pedal vibrates and operation sound occurs during sudden acceleration and corner- ing, when VDC function or TCS function is operated.		
Brake pedal vibrates and motor sound from the engine room occurs when the engine starts or the vehicle starts just after starting the engine.	This is not a malfunction because it is caused by operation check of ABS actuator and electric unit (control unit).	
Acceleration may be felt insufficient depending on the road conditions.	This is not a malfunction because it is caused by TCS function that puts the highest priority to obtain the optimum traction (stability).	
TCS function may operate momentarily while driving on a road where friction coefficient varies or when downshifting or fully depressing accelerator pedal.		
ABS warning lamp and VDC warning lamp may turn ON when the vehicle is on a rotating turntable or is given a strong shaking or large vibrations on a ship while the engine is running.	In this case, restart the engine on a nor-	
VDC warning lamp may turn ON and VDC function and TCS function may not normally op- erate, when driving on a special road the is extremely slanted (bank in a circuit course).	- mal road. If the normal condition is re- stored, there is no malfunction. In that case, erase "ABS" self-diagnosis result memory with CONSULT.	
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 and 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 vehi- cle on a chassis dynamometer, operate VDC OFF switch so that TCS function is OFF.)	

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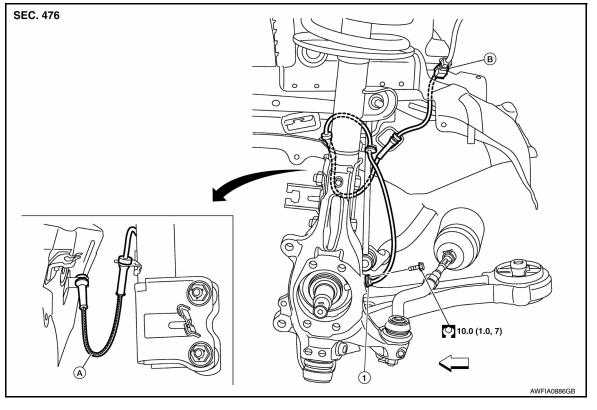
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UNIT REMOVAL AND INSTALLATION WHEEL SENSOR

Exploded View - Front Wheel Sensor

INFOID:000000011645006



- 1. Front wheel sensor
- A. Color line (slant line)
- B. Front wheel sensor connector

Front

Removal and Installation - Front Wheel Sensor

CAUTION:

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

REMOVAL

- 1. Remove the front wheel and tire using power tool. Refer to WT-58, "Adjustment".
- 2. Partially remove the fender protector to gain access to the wheel sensor harness connector.
- 3. Disconnect the front wheel sensor harness connector.
- 4. Remove the front wheel sensor bolt.
- 5. Remove the front wheel sensor from the strut bracket and body brackets.
- 6. Remove the front wheel sensor from the steering knuckle.

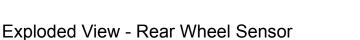
INSTALLATION

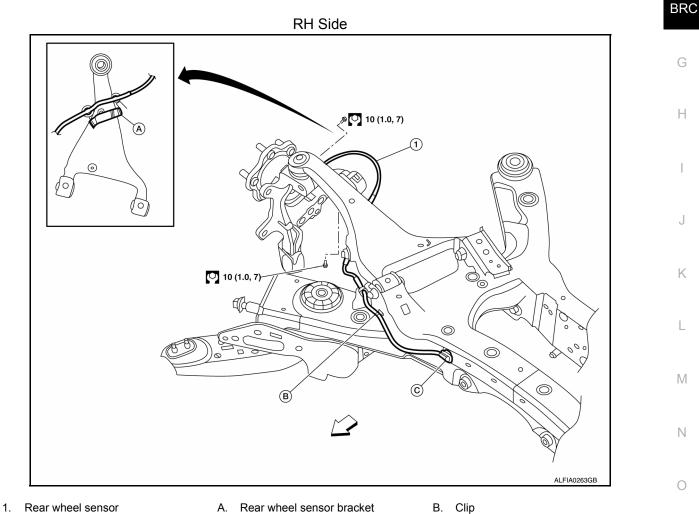
C. Rear wheel sensor connector

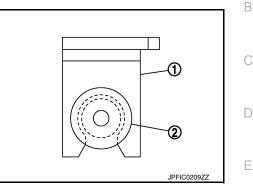
< UNIT REMOVAL AND INSTALLATION >

Installation is in the reverse order of removal. CAUTION:

- When installing, make sure there is no foreign material such as iron chips on and in the hole in the steering knuckle for the front wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- Do not twist front wheel sensor harness when installing front wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that front wheel sensor harness is not twisted after installation.







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2015 Pathfinder

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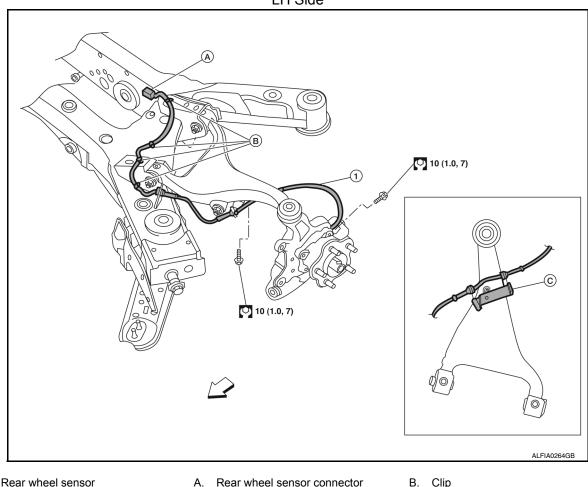
<>> Front

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WHEEL SENSOR

< UNIT REMOVAL AND INSTALLATION >

LH Side



1. Rear wheel sensor

C. Rear wheel sensor bracket

∠ Front

Removal and Installation - Rear Wheel Sensor

INFOID:000000011645009

CAUTION:

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

REMOVAL

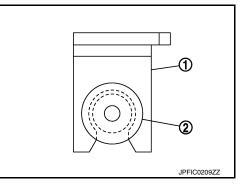
- Remove the rear wheel and tire using power tool. Refer to <u>WT-58, "Adjustment"</u>.
- Remove the rear wheel sensor bolt.
- Disconnect the rear wheel sensor harness connector. 3.
- 4. Remove the rear wheel sensor from the sensor brackets.
- 5. Remove the rear wheel sensor from the rear knuckle.

INSTALLATION

Installation is in the reverse order of removal. CAUTION:

< UNIT REMOVAL AND INSTALLATION >

- When installing, make sure there is no foreign material such as iron chips on and in the hole in the rear knuckle for the rear wheel sensor. Make sure no foreign material has been caught in the sensor A rotor. Remove any foreign material and clean the mount.
- Do not twist rear wheel sensor harness when installing rear wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that rear wheel sensor harness is not twisted after installation.





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< UNIT REMOVAL AND INSTALLATION >

SENSOR ROTOR

Removal and Installation - Front Sensor Rotor

The front wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>".

Removal and Installation - Rear Sensor Rotor

The rear wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to <u>RAX-7</u>, "<u>Removal and Installation</u>".

INFOID:000000011645010

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< UNIT REMOVAL AND INSTALLATION >

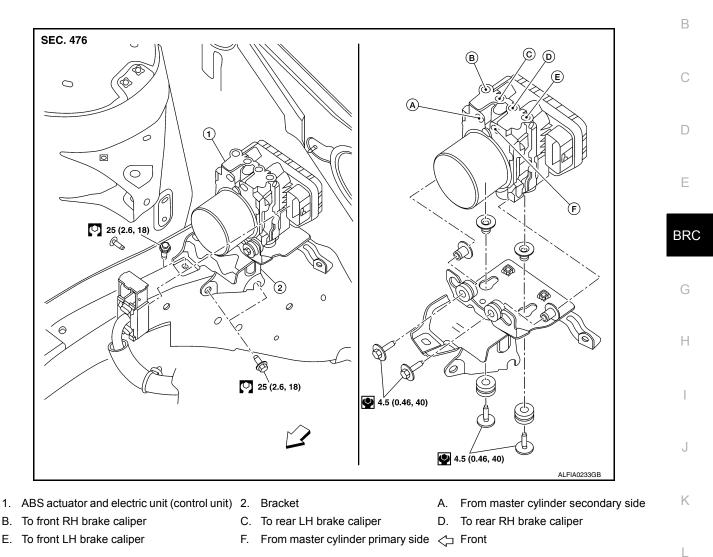
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000011645012

[TYPE 1]

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Removal and Installation

REMOVAL

CAUTION:

• To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged.

• Do not remove actuator by holding harness.

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

- 1. Disconnect negative battery terminal. Refer to PG-95, "Exploded View".
- 2. Remove cowl top. Refer to EXT-25, "Removal and Installation".
- 3. Disconnect the harness connector from the ABS actuator and electric unit (control unit).
- 4. Separate brake tubes from ABS actuator and electric unit (control unit). Refer to <u>BR-22, "FRONT :</u> <u>Exploded View"</u>.
- 5. Remove ABS actuator and electric unit (control unit) bracket bolts.
- 6. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

BRC-131

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< UNIT REMOVAL AND INSTALLATION >

[TYPE 1]

Installation is in the reverse order of removal.

- After work is completed, bleed air from brake tube. Refer to BR-16, "Bleeding Brake System".
- Adjust the neutral position of steering angle sensor. Refer to BRC-61, "Work Procedure".
- · Perform calibration of the yaw rate/side/decel G sensor: Refer to BRC-63, "Work Procedure".

CAUTION:

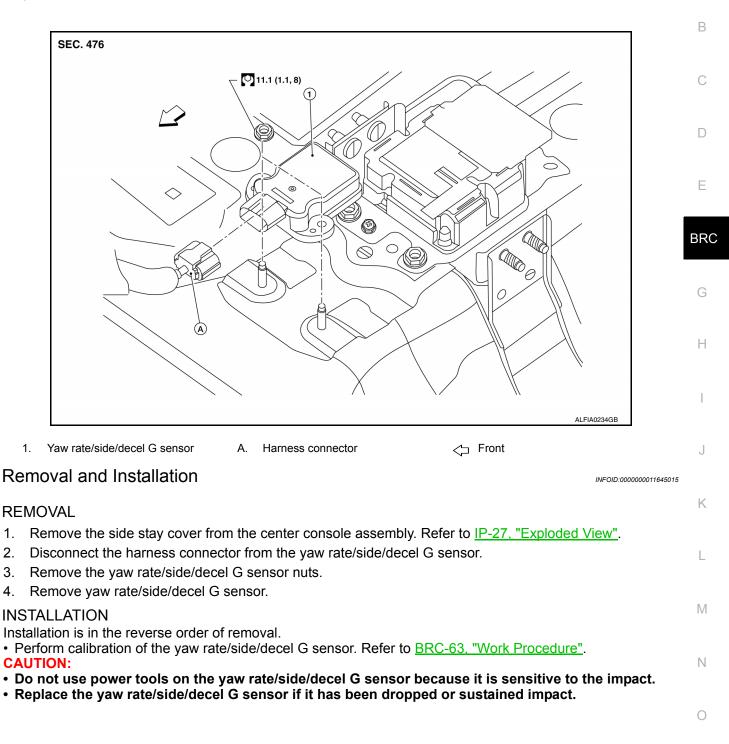
- To install, use flare nut crowfoot and torque wrench.
- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Do not install actuator by holding harness.
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked.

< UNIT REMOVAL AND INSTALLATION >

YAW RATE/SIDE/DECEL G SENSOR

Exploded View

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< UNIT REMOVAL AND INSTALLATION >

STEERING ANGLE SENSOR

Removal and Installation

To remove and install the steering angle sensor, remove and install spiral cable. Refer to <u>SR-15. "Removal</u> and Installation".

< PRECAUTION > PRECAUTION PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT **PRF-TENSIONER**" INFOID:000000011152865

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual. D

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- BRC Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Igni-Н tion ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery and wait at least three minutes before performing any service.

Precaution for Brake System

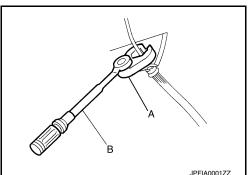
WARNING:

Clean any dust from the front brake and rear brake using a vacuum dust collector. Do not blow by compressed air.

- Brake fluid use refer to MA-15, "FOR USA AND CANADA : Fluids and Lubricants" (United States and Canada) or MA-17, "FOR MEXICO : Fluids and Lubricants" (Mexico).
- · Do not reuse drained brake fluid.
- · Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torgue when installing the brake pipes.
- M After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Do not use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.

BRC-135

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



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PRECAUTIONS

< PRECAUTION >

Precaution for Brake Control System

- Just after starting vehicle after ignition switch is ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level and oil leaks.
- If tire size and type are used in an improper combination or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or SLIP indicator lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspensionrelated parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).
- When driving with worn or deteriorated suspension, tires and brake-related parts.

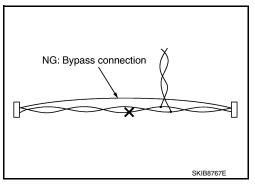
Precaution for Harness Repair

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SKIB8766E

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

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



OK: Soldered and taped

< PREPARATION >

PREPARATION PREPARATION

Special Service Tool

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INFOID:000000011152869 B

[TYPE 2]

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

Tool number (TechMate No.) Tool name		Description	С
KV991J0080		Checking operation of ABS active wheel sen-	
(J-45741)	nna Managana /	sors	D
ABS active wheel sensor tester	VFIA0101E		E
			BRC

Commercial Service Tools

INFOID:000000011152870

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

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APPLICATION NOTICE

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION APPLICATION NOTICE

Application Notice

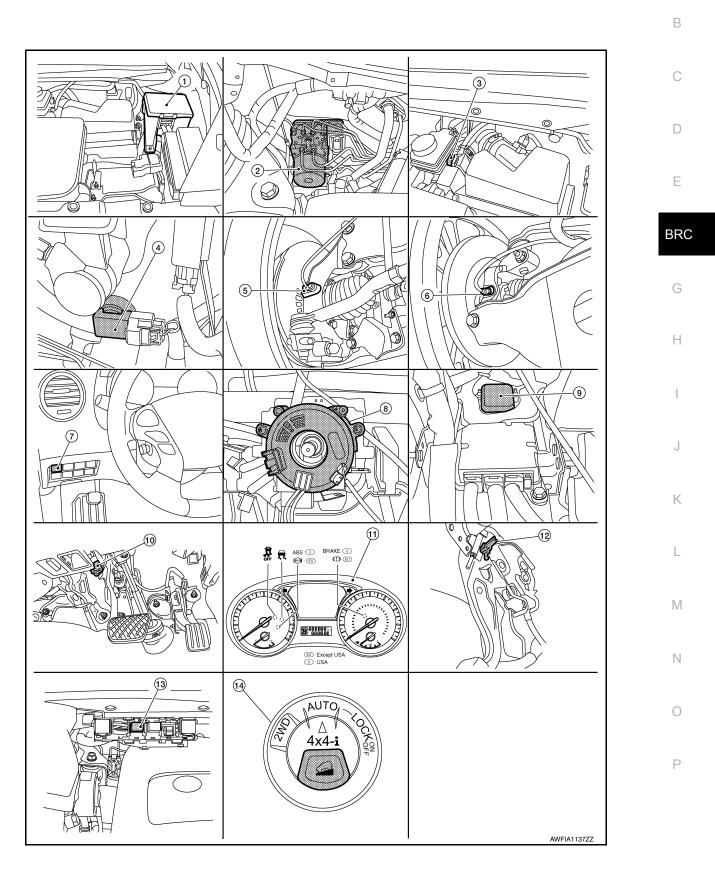
Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS

< SYSTEM DESCRIPTION >

COMPONENT PARTS

Component Parts Location

INFOID:000000011152871



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COMPONENT PARTS

< SYSTEM DESCRIPTION >

[TYPE 2]

- 1. IPDM E/R
- 4. Vacuum sensor (attached to lower side of brake booster)
- 7. VDC OFF switch
- 10. Stop lamp switch
- 13. Stop lamp relay

Component Description

- 2. ABS actuator and electric unit (con- 3. trol unit)
 - Front wheel sensor LH (RH similar) 6.
- 8. Steering angle sensor (view with steering wheel and steering column covers removed)
- 11. Combination meter

5.

- 14. 4WD shift switch (hill descent control switch)
- Brake fluid level switch (part of brake fluid reservoir)
- 6. Rear wheel sensor LH (RH similar)
- Yaw rate/side/decel G sensor (view with the center console removed)
- 12. Parking brake switch

9.

INFOID:0000000011152872

Component		Reference/Function
	Pump/motor	
	Motor relay	
	Actuator relay (main relay)	
ABS actuator and electric unit	ABS IN valve	
(control unit)	ABS OUT valve	BRC-140, "ABS Actuator and Electric Unit (Control Unit)"
	Cut valve 1	
	Cut valve 2	
	Pressure sensor	
Wheel sensor		BRC-141, "Wheel Sensor and Sensor Rotor"
Stop lamp switch		BRC-141, "Stop Lamp Switch"
Steering angle sensor		BRC-141, "Steering Angle Sensor"
Yaw rate/side/decel G sensor		BRC-141, "Yaw Rate/Side/Decel G Sensor"
Vacuum sensor		BRC-142, "Vacuum Sensor"
Brake fluid level switch		BRC-142, "Brake Fluid Level Switch"
Hill descent control switch		BRC-239. "Description"
Parking brake switch		BRC-142, "Parking Brake Switch"
VDC OFF switch		BRC-142, "VDC OFF Switch"
ЕСМ		 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal
ТСМ		 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Shift position signal Current gear position signal
ABS warning lamp		
Brake warning lamp		BRC-143, "System Description"
VDC OFF indicator lamp		
SLIP indicator lamp		
Hill descent control indicator lamp		BRC-246, "Description"

ABS Actuator and Electric Unit (Control Unit)

INFOID:000000011152873

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

BRC-140

COMPONENT PARTS [TYPE 2] < SYSTEM DESCRIPTION > ELECTRIC UNIT (CONTROL UNIT) Brake fluid pressure, engine and transmission are controlled according to signals from each sensor. А • If malfunction is detected, the system enters fail-safe mode. ACTUATOR В 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 Ε 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 BRC 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 and hill start assist function are activated. Н Wheel Sensor and Sensor Rotor INFOID:000000011152874 NOTE: Wheel sensor and sensor rotor is integrated in wheel hub assembly. Never measure resistance and voltage value using a tester because sensor is active sensor. Downsize and weight reduction is aimed. IC for detection portion -Line of magnetic force and magnet for sensor rotor are adopted. · Power supply is supplied to detection portion so that magnetic field Sensor rotor s_ line is read. Magnetic field that is detected is converted to current Ν signal. S • When sensor rotor rotates, magnetic field changes. Magnetic field change is converted to current signals (rectangular wave) and is Sensor Amplifier circuit transmitted to ABS actuator and electric unit (control unit). Change of magnetic field is proportional to wheel speed. JPFIC0131GB M Stop Lamp Switch INFOID:000000011152875 Detects the operation status of brake pedal and transmits converted electric signal to ABS actuator and elec-Ν tric unit (control unit).

Steering Angle Sensor

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

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

Yaw Rate/Side/Decel G Sensor

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

Vehicle rotation angular velocity (yaw rate signal)

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

· Vehicle lateral acceleration (side G signal) / longitudinal acceleration (decel G signal)

Brake Fluid Level Switch

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

Vacuum Sensor

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

Parking Brake Switch

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

VDC OFF Switch

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

Brake limited slip differential (BLSD) control operates.

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

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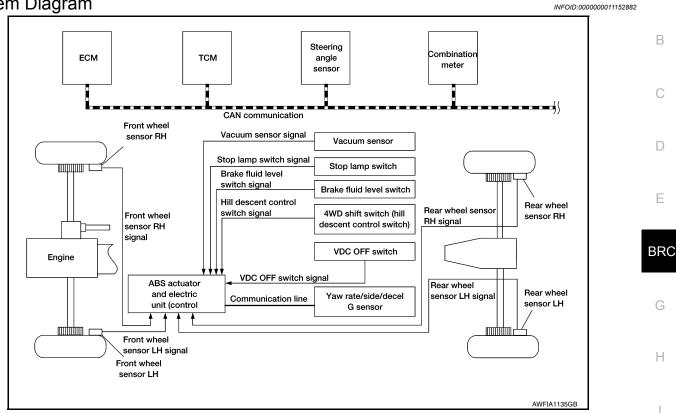
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< SYSTEM DESCRIPTION >

SYSTEM

System Diagram



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, hill start assist function and hill descent control function.
- Fail-safe function is available for each function and is activated by each function when system malfunction occurs.

INPUT SIGNAL AND OUTPUT SIGNAL

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

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

VDC function, TCS function, ABS function and EBD function

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< SYSTEM DESCRIPTION >

[TYPE 2	2]
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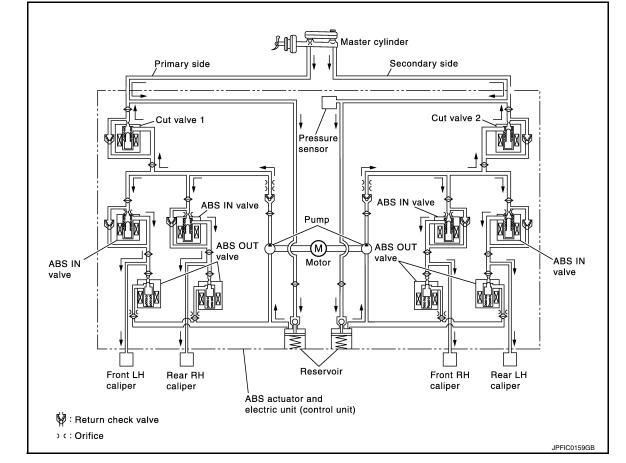
Component	Signal description
Steering angle sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Steering angle sensor signal
Combination meter	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Brake fluid level switch signal 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 warning lamp signal VDC OFF indicator lamp Hill descent control indicator lamp

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

VALVE OPERATION (ABS AND EBD)

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

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

< SYSTEM DESCRIPTION >

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.

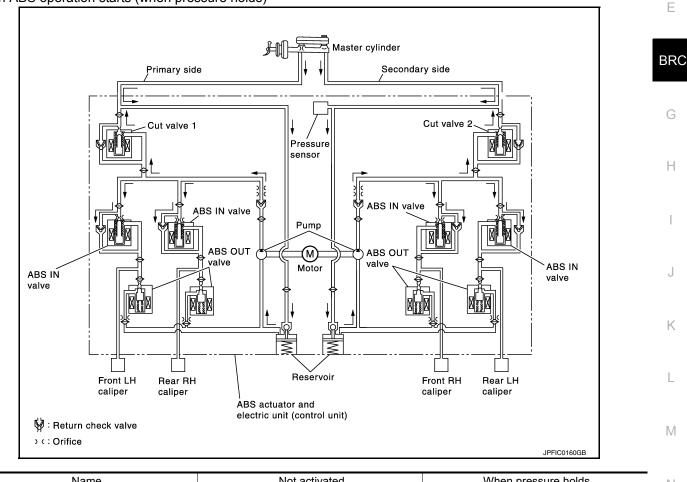
When rear RH wheel caliper pressure increases

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	Ν
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)	0
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)	-
Each caliper (fluid pressure)		Pressure holds	Р

When front RH wheel caliper pressure holds

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

When front LH wheel caliper pressure holds

< SYSTEM DESCRIPTION >

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

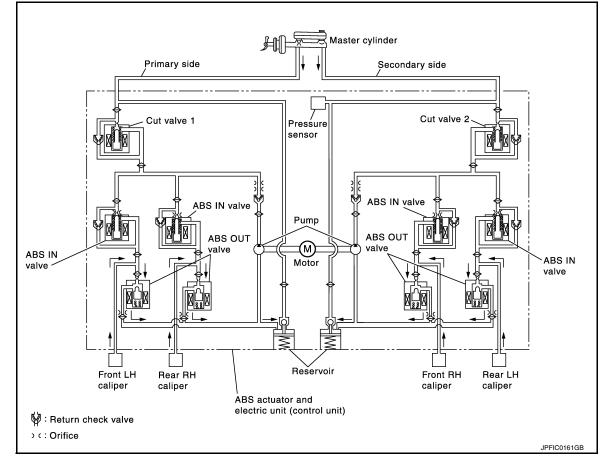
When rear RH wheel caliper pressure holds

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

When rear LH wheel caliper pressure holds

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

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.

< SYSTEM DESCRIPTION >

Component Parts and Function

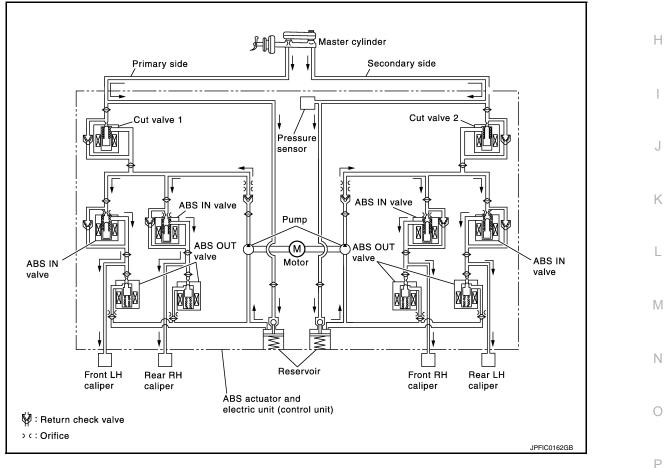
Component	FUNCTION
Reservoir	Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper.
Pump	Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.
Motor	Drives the pump according to 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



< SYSTEM DESCRIPTION >

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 sup- plied (open) Only wheel that the pressure is to be in- creased: 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 sup- plied (open) Only wheel that the pressure is to be in- creased: Power supply is supplied (close)	
ABS IN valve	Power supply is not supplied (open)	Only wheel that the pressure is to be in- creased: Power supply is not supplied (open) Wheel other than the one that the pressure is to be increased: Power supply is supplied (close)	
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)	
Each caliper (fluid pressure)	_	Pressure increases	

When front RH wheel caliper pressure increases

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

When front LH wheel caliper pressure increases

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

When rear RH wheel caliper pressure increases

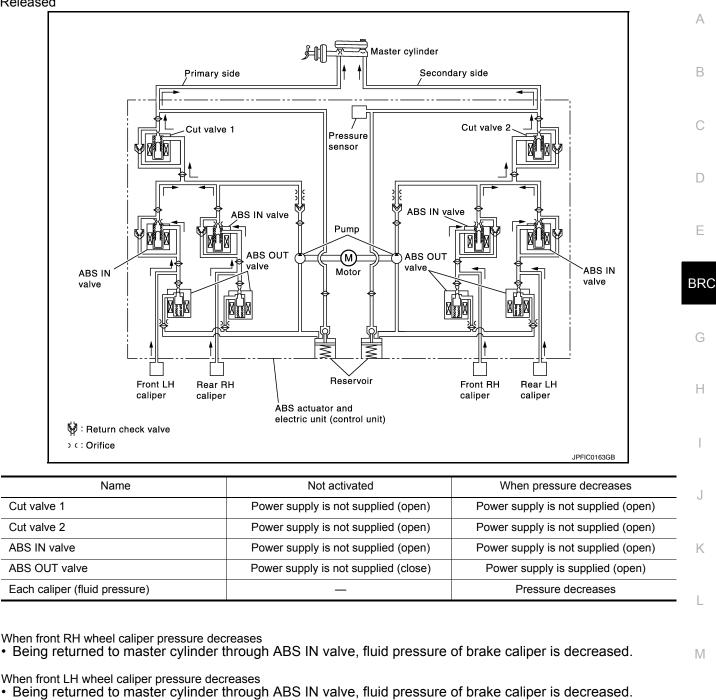
 Motor is activated. Brake fluid from pump is supplied to front RH wheel caliper through ABS IN valve. For other wheel, ABS IN valve is closed and brakes fluid is not supplied to caliper.

When rear LH wheel caliper pressure increases

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

< SYSTEM DESCRIPTION >

Released



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 decreas- es 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.

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2015 Pathfinder

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[TYPE 2]

< SYSTEM DESCRIPTION >

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

CONDITIONS FOR TURNING ON THE WARNING LAMP

ABS Warning Lamp

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

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

Brake Warning Lamp

 Turns ON at the same time as ABS warning lamp and VDC warning lamp when EBD function is malfunctioning.

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

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

VDC Warning Lamp

• Turns ON when either VDC function, TCS function, ABS function or EBD function is malfunctioning.

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

Condition (status)	VDC warning lamp
Ignition switch OFF	OFF
For approx. 1 second after the ignition switch is turned ON	ON
Approx. 1 second after ignition switch is turned ON (when the system is in normal operation)	OFF
VDC function is malfunctioning	ON
TCS function is malfunctioning	ON

< SYSTEM DESCRIPTION >

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Condition (status)	VDC warning lamp	
ABS function is malfunctioning	ON	A
EBD function is malfunctioning	ON	
VDC function is operating	Blinking	В
TCS function is operating	Blinking	

CONDITIONS FOR TURNING 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 second after the ignition switch is turned ON	ON	
Approx. 1 second after ignition switch is turned ON (when the system is in normal operation)	OFF	BRC
When VDC OFF switch is ON (VDC function and TCS function are OFF)	ON	G

Hill descent control indicator lamp

- Turns ON when hill descent control function is switched to operational status (ON) by hill descent control switch.
- Turns ON when ignition switch turns ON and turns OFF when the system is normal for bulb check purposes.

Condition (status)	Hill descent control indicator lamp	
Ignition switch OFF	OFF	
For 2 seconds after turning ON ignition switch	ON	
2 seconds later after turning ON ignition switch	OFF	
Hill descent control function is malfunctioning	OFF	

Fail-Safe

INFOID:000000011152884

VDC FUNCTION, TCS FUNCTION and hill start assist FUNCTION

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

ABS FUNCTION

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

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

EBD FUNCTION

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

< SYSTEM DESCRIPTION >

DTC	Malfunction detected condition	Fail-safe condition	
C1101	When an open circuit is detected in rear RH wheel sensor circuit.		
C1102	When an open circuit is detected in rear LH wheel sensor circuit.		
C1103	When an open circuit is detected in front RH wheel sensor circuit.		
C1104	When an open circuit is detected in front LH wheel sensor circuit.		
C1105	 When 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. 	The following functions are sus-	
C1106	 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. 	 pended: VDC function TCS function ABS function EBD function (only when both 2 rear wheels are malfunctioning 	
C1107	 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. 	 hill start assist function 	
C1108	 When power supply voltage of front LH wheel sensor is low. When distance between front LH wheel sensor and front LH wheel sensor rotor is large. When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. 		
C1109	When ignition voltage is 10 V or less.When ignition voltage is 16 V or more.	The following functions are sus- pended:	
C1111	When a malfunction is detected in motor or motor relay.	 VDC function TCS function ABS function EBD function hill start assist function 	
C1115	When difference in wheel speed between any wheel and others is detected during the vehicle is driven, because of installation of other tires than specified.	The following functions are suspended:	
C1116	When stop lamp switch signal is not input when brake pedal operates.	 VDC function TCS function ABS function hill start assist function 	
C1120	When a malfunction is detected in front LH ABS IN valve.		
C1121	When a malfunction is detected in front LH ABS OUT valve.	The following functions are sus-	
C1122	When a malfunction is detected in front RH ABS IN valve.	pended:	
C1123	When a malfunction is detected in front RH ABS OUT valve.	VDC function TCS function	
C1124	When a malfunction is detected in rear LH ABS IN valve.	ABS function	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	 EBD function hill start assist function 	
C1126	When a malfunction is detected in rear RH ABS IN valve.		
C1127	When a malfunction is detected in rear RH ABS OUT valve.		
C1130	When a malfunction is detected in ECM system.	 The following functions are suspended: VDC function TCS function hill start assist function 	

< SYSTEM DESCRIPTION >

[TYPE 2]

DTC	Malfunction detected condition	Fail-safe condition
C1140	When a malfunction is detected in actuator relay.	The following functions are sus- pended: • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1142	When a malfunction is detected in pressure sensor.	The following functions are sus-
C1143	When a malfunction is detected in steering angle sensor.	pended:VDC function
C1144	When neutral position adjustment of steering angle sensor is not complete.	TCS function
C1145	When a malfunction is detected in yaw rate signal.	 hill start assist function
C1146	When a malfunction is detected in side/decel G signal.	The following functions are sus-
C1155	When brake fluid level low signal is detected.	 pended: VDC function TCS function ABS function hill start assist function
C1160	When calibration of yaw rate/side/decel G sensor is not complete.	 The following functions are suspended: VDC function TCS function hill start assist function
C1164	When a malfunction is detected in cut valve 1.	The following functions are sus-
C1165	When a malfunction is detected in cut valve 2.	pended:VDC function
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	 TCS function ABS function EBD function hill start assist function
C1197	When a malfunction is detected in vacuum sensor.	
C1198	 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. 	Electrical vacuum assistance of brake booster is suspended.
C1199	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.	_
C119A	When a malfunction is detected in supply power voltage of vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.
U1000	When CAN communication signal is not continuously received for 2 seconds or more.	The following functions are sus- pended: • VDC function • TCS function • hill start assist function

VDC FUNCTION

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[TYPE 2]

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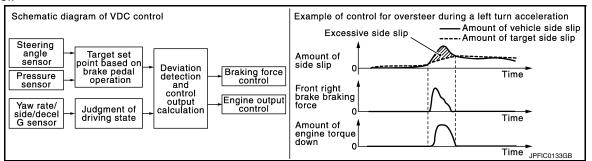
VDC FUNCTION : System Diagram

	r		cation
VDC OFF switch Vacuum sensor	VDC OFF switch signal		
	Stop lamp Stop lamp relay		
Front wheel sensor RH	Front wheel sensor RH signal Front wheel sensor LH signal	ABS actuator and electric unit (control unit)	
Rear wheel sensor RH	Rear wheel sensor RH signal Rear wheel sensor LH signal		Combination meter
Yaw rate/side/decel G sensor	Communication line		Steering angle sensor

VDC FUNCTION : System Description

INFOID:0000000011152886

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



- VDC function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as
 engine output control by transmitting drive signal to actuator portion according to difference between target
 side slip amount and vehicle side slip amount
- VDC warning lamp blinks while VDC function is in operation and indicates to the driver that the function is in operation.
- VDC function has brake limited slip differential (BLSD) function. LH and RH driving wheel spin is always monitored. If necessary, appropriate brake force is independently applied to LH or RH driving wheel so that one-sided wheel spin is avoided and traction is maintained. Mainly starting ability is improved. [Brake limited slip differential (BLSD) function operates while VDC function is in non-operational status (OFF) by VDC OFF

< SYSTEM DESCRIPTION >

[TYPE 2]

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switch.] VDC warning lamp turns ON when Brake limited slip differential (BLSD) function is in operation. Noises and vibration may be generated due to brake operation. This is not a malfunction.

- CONSULT can be used to diagnose the system.
- Fail-safe function is adopted. When a malfunction occurs in VDC function, the control is suspended for VDC function, TCS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-151</u>, "Fail-Safe".

NOTE:

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

INPUT SIGNAL AND OUTPUT SIGNAL

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

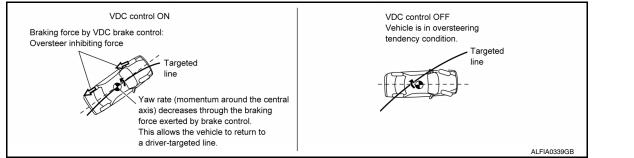
Component	Signal description
Yaw rate/side/decel G sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*¹: Yaw rate signal Side G sensor signal Decel G sensor signal
ECM	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Acceleration pedal position signal Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: Target throttle position signal
ГСМ	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication:Shift position signal
Steering angle sensor	 Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: Steering angle sensor signal
Combination meter	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Brake fluid level switch signal 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

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

OPERATION CHARACTERISTICS

VDC Function That Prevents Oversteer Tendency

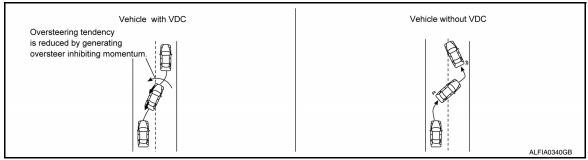
• During a cornering, brake force (brake fluid pressure) is applied on front wheel and rear wheel on the outer side of turn. Momentum directing towards the outer side of turn is generated. Oversteer is prevented.



< SYSTEM DESCRIPTION >

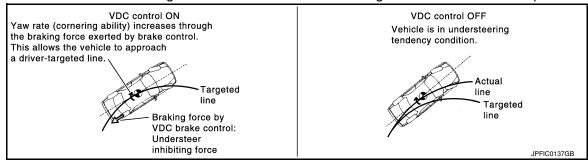
[TYPE 2]

 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.

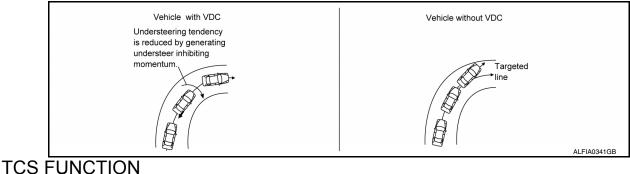


VDC Function That Prevents Understeer Tendency

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



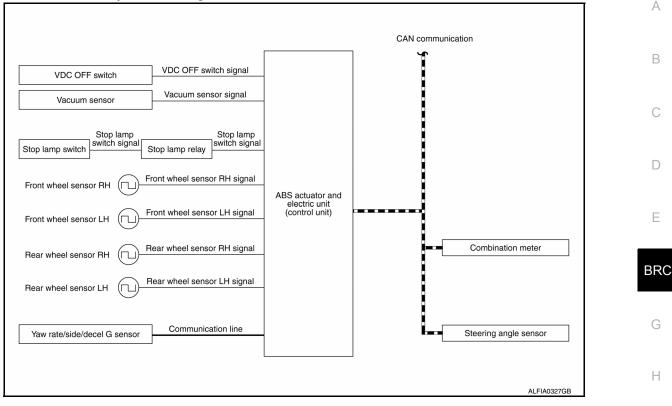
• Applying braking during cornering on a slippery road, when understeer tendency is judged large, engine output is controlled as well as brake force (brake fluid pressure) of four wheels. Understeer tendency decreases.



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< SYSTEM DESCRIPTION >

TCS FUNCTION : System Diagram



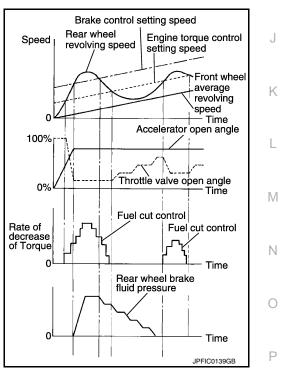
TCS FUNCTION : System Description

- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Engine output and transmission shift status is controlled so that slip rate of drive wheels is at an 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.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for VDC function, TCS function, and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-151</u>. "Fail-Safe".

INPUT SIGNAL AND OUTPUT SIGNAL

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

INFOID:0000000011152888



INFOID:000000011152887

< SYSTEM DESCRIPTION >

[TYPE]	2]
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Component	Signal description	
Yaw rate/side/decel G sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1: Yaw rate signal Side G sensor signal Decel G sensor signal 	
ECM	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Accelerator pedal position signal Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: Target throttle position signal 	
ТСМ	 Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: Shift position signal 	
Steering angle sensor	 Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: Steering angle sensor signal 	
Combination meter	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Brake fluid level switch signal 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 	

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

ABS FUNCTION : System Diagram

_		CAN communication
Stop lamp Stop lamp Stop lamp switch signal Stop lamp relay		
Vacuum sensor Vacuum sensor signal		
Front wheel sensor RH	ABS actuator and electric unit (control unit)	Combination meter
Rear wheel sensor RH		
Rear wheel sensor LH Hear wheel sensor LH signal Yaw rate/side/decel G sensor Communication line		

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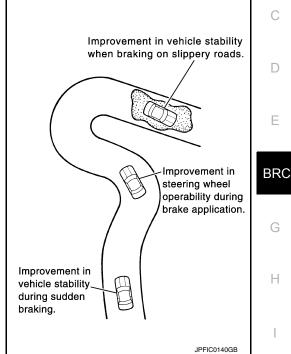
< SYSTEM DESCRIPTION >

ABS FUNCTION : System Description

- By preventing wheel lock through brake force (brake fluid pressure) control that is electronically controlled by detecting wheel speed during braking, stability during emergency braking is improved so that obstacles can be avoided by steering operation.
- During braking, control unit 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 and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and hill start assist function. However, EBD function is operated normally. Refer to BRC-151, "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 feel heavy when depressing brake pedal lightly. These symptoms are not malfunctions.



INPUT SIGNAL AND OUTPUT SIGNAL

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

Component	Signal description	K
Steering angle sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Steering angle sensor signal 	L
Combination meter	 Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: ABS warning lamp signal VDC warning lamp signal 	M

EBD FUNCTION

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< SYSTEM DESCRIPTION >

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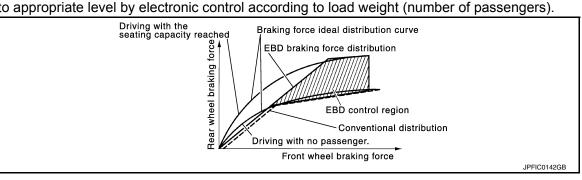
EBD FUNCTION : System Diagram

Stop lamp Stop lamp		- -	
top lamp Stop lamp Stop lamp Stop lamp switch signal Stop lamp relay			
Vacuum sensor signal			
Front wheel sensor RH Front wheel sensor RH signal	ABS actuator and		
Front wheel sensor LH Internet wheel sensor LH signal	electric unit (control unit)		Combination meter
Rear wheel sensor RH	-		
Rear wheel sensor LH			
Yaw rate/side/decel G sensor			

EBD FUNCTION : System Description

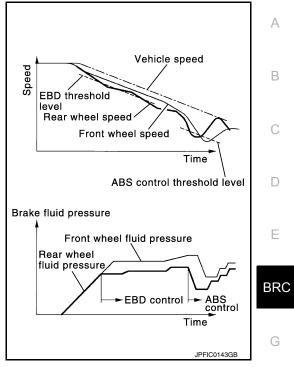
INFOID:0000000011152892

- 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).



< SYSTEM DESCRIPTION >

- During braking, control unit portion compares slight slip on front • and rear wheels by wheel speed sensor signal, transmits drive signal to actuator portion when rear wheel slip exceeds front wheel slip for the specified value or more, and controls rear wheel brake force (brake fluid pressure) so that increase of rear wheel slip is prevented and slips on front wheel and rear wheel are nearly equalized. ABS control is applied when slip on each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT can be used to diagnose the system.
- · Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for VDC function, TCS function, ABS function, EBD function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function and hill start assist function. Refer to BRC-151, "Fail-Safe".



[TYPE 2]

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INPUT SIGNAL AND OUTPUT SIGNAL

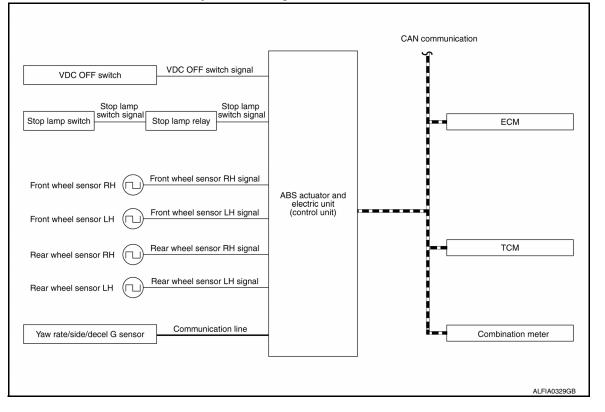
Major signal transmission between each unit via communication lines is shown in the following table.

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

TIII SIAH ASSISI FUNCTIUN

< SYSTEM DESCRIPTION >

Hill start assist FUNCTION : System Diagram



Hill start assist FUNCTION : System Description

INFOID:0000000011152894

- 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 an uphill slope of slope ratio 10% or more and selector lever is in any position other than P (Park) or N (Neutral).
- 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 starts by accelerator operation, the brake is released automatically and a smooth start is performed.
- Fail-safe function is adopted. When a malfunction occurs in hill start assist function, the control is suspended for VDC function, TCS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-151</u>, "Fail-Safe".

INPUT SIGNAL AND OUTPUT SIGNAL

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

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

< SYSTEM DESCRIPTION >

Component	Signal description
ТСМ	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: Shift position signal
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: VDC warning lamp signal VDC OFF indicator lamp signal

*: Communication line between yaw rate/side/decel G sensor and ABS actuator and electric unit (control unit) hill descent control (Downhill Drive Support) FUNCTION

hill descent control (Downhill Drive Support) FUNCTION : System Diagram INFOLD 00000011653660

			CAN comm	nunication	BRC
VDC OFF switch	VDC OFF switch signal	_	Ĩ		
Stop lamp Stop lamp switch	Stop lamp switch signal	-	_	ECM	G
4WD shift switch (hill descent control switch)	Hill descent control switch signal	-			Н
Front wheel sensor RH	Front wheel sensor RH signal	ABS actuator and electric unit			I
Front wheel sensor LH	Front wheel sensor LH signal	- (control unit)		ТСМ	
Rear wheel sensor RH	Rear wheel sensor RH signal				J
Rear wheel sensor LH	Rear wheel sensor LH signal	-	-	Combination meter	K
Yaw rate/side/decel G sensor	Communication line			Steering angle sensor	L
				AWFIA1136GB	Μ

hill descent control (Downhill Drive Support) FUNCTION : System Description

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[TYPE 2]

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- The hill descent control system will help maintain vehicle speed when driving under 25 km/h (15 MPH) on steeper downhill grades. Hill descent control will provide braking allowing the driver to concentrate on steering while reducing the burden of brake and accelerator operation.
- To operate the system, set the 4WD switch to 4WD LOCK and push the hill descent control switch. The hill descent control indicator in the combination meter will turn on. While hill descent control is operating, the stop/tail lamps will illuminate.
- If the accelerator or brake pedal is depressed while the hill descent control system is on, the system will stop perating.
- During hill descent control operation, a mechanical noise may be heard. This is normal.
- Electrical system diagnosis by CONSULT is available.

INPUT SIGNAL AND OUTPUT SIGNAL

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

< SYSTEM DESCRIPTION >

Component	Signal description
Yaw rate/side/decel G sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line *: Yaw rate signal Side G sensor signal Decel G sensor signal
ECM	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Accelerator pedal position signal Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: Target throttle position signal
ТСМ	 Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: Shift position signal
Steering angle sensor	 Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: Steering angle sensor signal
Combination meter	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: Brake fluid level switch signal Parking brake switch signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: Hill descent control indicator lamp signal

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

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

< SYSTEM DESCRIPTION >

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

CONSULT Function

INFOID:0000000011152895

[TYPE 2]

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CAUTION:

After disconnecting the CONSULT vehicle interface (VI) from the data link connector, the ignition must be cycled OFF \rightarrow ON (for at least 5 seconds) \rightarrow OFF. If this step is not performed, the BCM may not go to "sleep mode", potentially causing a discharged battery and a no-start condition.

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.	E
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.	BR
ACTIVE TEST	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ABS actuator and elec- tric unit (control unit) and also shifts some parameters in a specified range.	
WORK SUPPORT	Components can be quickly and accurately adjusted.	G
DTC Freeze frame data (FFD) CU IDENTIFICATION ABS actuator and electric ELF DIAGNOSTIC RE Refer to <u>BRC-176, "DTC I</u>		H
When "CRNT" is displayed on The system is presently	self-diagnosis result,	J
	self-diagnosis result, ne past is detected, but the system is presently normal.	K
reeze frame data (FFD) The following vehicle statu	us is recorded when DTC is detected and is displayed on CONSULT.	L

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

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:

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

< SYSTEM DESCRIPTION >

[TYPE 2]

- When active test is performed while depressing the pedal, the pedal depressing stroke may change. This is not a malfunction.
- "TEST IS STOPPED" is displayed approx. 10 seconds after operation start.
- When performing active test again after "TEST IS STOPPED" is displayed, select "BACK".
- 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 Itam	Display			
	Display Item	Up	Кеер	Down	
FR RH SOL	FR RH IN SOL	Off	On*	On*	
FK KH SOL	FR RH OUT SOL	Off	Off	On*	
FR LH SOL	FR LH IN SOL	Off	On*	On*	
	FR LH OUT SOL	Off	Off	On*	
RR RH SOL	RR RH IN SOL	Off	On*	On*	
RR RH SUL	RR RH OUT SOL	Off	Off	On*	
RR LH SOL	RR LH IN SOL	Off	On*	On*	
	RR LH OUT SOL	Off	Off	On*	

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

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

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

Test item	Display Itam		Display	
	Display Item	Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
FR RH ABS SOLE-	FR RH OUT SOL	Off	Off	Off
NOID (ACT)	CV1	Off	Off	Off
	CV2	Off	On*	On*
	FR LH IN SOL	Off	Off	Off
FR LH ABS SOLE-	FR LH OUT SOL	Off	Off	Off
NOID (ACT)	CV1	Off	On*	On*
	CV2	Off	Off	Off
	RR RH IN SOL	Off	Off	Off
RR RH ABS SOLE-	RR RH OUT SOL	Off	Off	Off
NOID (ACT)	CV1	Off	On*	On*
	CV2	Off SOL Off T SOL Off Off Off SOL Off SOL Off JT SOL Off Off Off Off Off	Off	Off
	RR LH IN SOL	Off	On*	Off
RR LH ABS SOLE-	RR LH OUT SOL	Off	Off	Off
NOID (ACT)	CV1	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.

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

< SYSTEM DESCRIPTION >

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

STOP LAMP ON RELAY

Touch "On" and "Off" on screen. Make sure stop lamp relay operates as shown in table below. Brake lamps ^C will illuminate when relay is "On".

Operation	On	Off	D
STP ON RLY	On	Off	

NOTE:

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

DATA MONITOR

	Monitor ite	m selection	×: Applicable
Item (Unit)	ECU INPUT SIG- NALS	MAIN SIGNALS	Note
FR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front LH wheel sensor is displayed.
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front RH wheel sensor is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear LH wheel sensor is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear RH wheel sensor is displayed.
DECEL G-SEN (m/s ²)	×	×	Decel G detected by decel G sensor is displayed.
FR RH IN SOL (On/Off)		×	Operation status of front RH wheel ABS IN valve is displayed.
FR RH OUT SOL (On/Off)		×	Operation status of front RH wheel ABS OUT valve is displayed.
FR LH IN SOL (On/Off)		×	Operation status of front LH wheel ABS IN valve is displayed.
FR LH OUT SOL (On/Off)		×	Operation status of front LH wheel ABS OUT valve is displayed.
RR RH IN SOL (On/Off)		×	Operation status of rear RH wheel ABS IN valve is displayed.
RR RH OUT SOL (On/Off)		×	Operation status of rear RH wheel ABS OUT valve is displayed.
RR LH IN SOL (On/Off)		×	Operation status of rear LH wheel ABS IN valve is displayed.
RR LH OUT SOL (On/Off)		×	Operation status of rear LH wheel ABS OUT valve is displayed.
EBD WARN LAMP (On/Off)			Brake warning lamp ON/OFF status is displayed. (Note 1)
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal input status is displayed.
MOTOR RELAY (On/Off)		×	ABS motor and motor relay status is displayed.

[TYPE 2]

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

< SYSTEM DESCRIPTION >

[TYPE 2]

	Monitor ite	m selection	
Item (Unit)	ECU INPUT SIG- NALS	MAIN SIGNALS	Note
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)
OFF SW (On/Off)	×	×	VDC OFF switch status is displayed
SLIP/VDC LAMP (On/Off)		×	VDC warning lamp ON/OFF status is displayed. ^(Note 1)
BATTERY VOLT (V)	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.
GEAR	×	×	Current gear position judged from current gear position signal is displayed.
SLCT LVR POSI	×	×	Current gear position judged from current gear position signal is displayed.
ENGINE SPEED (tr/min)	×	×	Engine speed status is displayed.
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate sensor is displayed.
R POSI SIG (On/Off)			R range signal input status judged from R range signal is displayed.
4WD MODE MON (AUTO/2WD/LOCK)	×	×	4WD control status is displayed.
N POSI SIG (On/Off)			N range signal input status judged from N range signal is displayed.
CV1 (On/Off)			Cut valve 1 operation status is displayed.
CV2 (On/Off)			Cut valve 2 operation status is displayed.
ACCEL POS SIG (%)	×		Displays the Accelerator pedal position.
SIDE G -SENSOR (m/s ²)	×		Side G detected by side G sensor is displayed.
STR ANGLE SIG (°)	×		Steering angle detected by steering angle sensor is displayed.
PRESS SENSOR (bar)	×		Brake fluid pressure detected by pressure sensor is displayed.
EBD SIGNAL (On/Off)			EBD operation status is displayed.
ABS SIGNAL (On/Off)			ABS operation status is displayed.
TCS SIGNAL (On/Off)			TCS operation status is displayed.
VDC SIGNAL (On/Off)			VDC operation status is displayed.
EBD FAIL SIG (On/Off)			EBD fail-safe signal status is displayed.
ABS FAIL SIG (On/Off)			ABS fail-safe signal status is displayed.

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

< SYSTEM DESCRIPTION >

[TYPE 2]

	Monitor ite	m selection		
Item (Unit)	ECU INPUT SIG- NALS	MAIN SIGNALS	Note	1
TCS FAIL SIG (On/Off)			TCS fail-safe signal status is displayed.	E
VDC FAIL SIG (On/Off)			VDC fail-safe signal status is displayed.	
CRANKING SIG (On/Off)			Cranking status is displayed.	(
FLUID LEV SW (On/Off)	×		Brake fluid level signal input status via CAN communication is displayed.	[
PARK BRAKE SW (On/Off)	×		Parking brake switch signal input status via CAN communi- cation is displayed.	
STP ON RLY (On/Off)			Stop lamp relay signal (On/Off) status is displayed.	E
DDS SW ^(Note 2) (On/Off)			Hill descent control switch (On/Off) status is displayed.	B
DDS SIG ^(Note 2) (On/Off)			Hill descent control operation (On/Off) status is displayed.	
USS SIG ^(Note 3) (On/Off)			Hill start assist operation status is displayed.	(

Note 1: Refer to <u>BRC-143, "System Description"</u> for ON/OFF conditions of each warning lamp and indicator lamp.

Note 2: DDS means "hill descent control."

Note 3: USS means "hill start assist."

WORK SUPPORT

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

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ECU DIAGNOSIS INFORMATION APPLICATION NOTICE

Application Notice

INFOID:000000011645025

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS

< ECU DIAGNOSIS INFORMATION >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000011152896

CONSULT DATA MONITOR STANDARD VALUE

Monitor item	Condition	Reference values in normal operation
	Vehicle stopped	0.00 km/h (MPH)
FR LH SENSOR	When driving ^(Note 1)	Nearly matches the speedometer display (within $\pm 10\%$)
	Vehicle stopped	0.00 km/h (MPH)
FR RH SENSOR	When driving ^(Note 1)	Nearly matches the speedometer display (within $\pm 10\%$)
	Vehicle stopped	0.00 km/h (MPH)
RR LH SENSOR	When driving ^(Note 1)	Nearly matches the speedometer display (within $\pm 10\%$)
	Vehicle stopped	0.00 km/h (MPH)
RR RH SENSOR	When driving ^(Note 1)	Nearly matches the speedometer display (within $\pm 10\%$)
	When stopped	Approx. 0 m/s ²
DECEL G-SEN	During acceleration	Positive value
	During deceleration	Negative value
FR RH IN SOL	Active	On
-R RH IN SOL	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
EBD WARN LAMP	When brake warning lamp is $ON^{(Note 2)}$	On
	When brake warning lamp is OFF ^(Note 2)	Off
	Brake pedal depressed	On
STOP LAMP SW	Brake pedal not depressed	Off
	Active	On
MOTOR RELAY	Not activated	Off
ACTUATOR RLY	Active	On
	When not operating (in fail-safe mode)	Off

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< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition	Reference values in normal operation
	When ABS warning lamp is ON ^(Note 2)	On
ABS WARN LAMP	When ABS warning lamp is OFF ^(Note 2)	Off
	When VDC OFF indicator lamp is ON ^(Note 2)	On
OFF LAMP	When VDC OFF indicator lamp is OFF ^(Note 2)	Off
	When VDC OFF switch is ON	On
OFF SW	When VDC OFF switch is OFF	Off
	When VDC warning lamp is ON ^(Note 2)	On
SLIP/VDC LAMP	When VDC warning lamp is OFF ^(Note 2)	Off
BATTERY VOLT	Ignition switch ON	10 – 16 V
		1-7
GEAR	Driving	Depending on shift status
SLCT LVR POSI	Vehicle stopped	N/P Depending on shift status
ENGINE SPEED	Engine stopped	0 tr/min
	Engine running	Almost same reading as tachometer
	Vehicle stopped	Approx. 0 d/s
YAW RATE SEN	Turning right	Negative value
	Turning left	Positive value
R POSI SIG	When selector lever is in the R position	On
	When selector lever is in the other position than R	Off
	When 4WD shift switch is in AUTO position	AUTO
4WD MODE MON	When 4WD shift switch is in 4H position	LOCK
	When 4WD shift switch is in 2WD position	2WD
N POSI SIG	When selector lever is in the N position	On
	When selector lever is in the other position than N	Off
CV1	Active	On
	Not activated	Off
CV2	Active	On
0.12	Not activated	Off
ACCEL POS SIG	Never depress accelerator pedal (with ignition switch ON)	0%
	Depress accelerator pedal (with ignition switch ON)	0 – 100%
	Vehicle stopped	Approx. 0 m/s ²
SIDE G-SENSOR	Right turn	Negative value
	Left turn	Positive value
	When driving straight	0±2.5°
STR ANGLE SIG	When steering wheel is steered to LH by 90°	Approx. +90°
	When steering wheel is steered to RH by 90°	Approx. –90°
	Brake pedal not depressed	Approx. 0 bar
PRESS SENSOR	Brake pedal depressed	(–40) – (+300 bar)
	EBD activated	On
EBD SIGNAL	EBD not activated	Off
ABS SIGNAL	ABS is activated	On
	ABS is not activated	Off

Revision: September 2014

< ECU DIAGNOSIS INFORMATION >

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Monitor item	Condition	Reference values in normal operation	
TCS SIGNAL	TCS activated	On	
ICS SIGNAL	TCS not activated	Off	
VDC SIGNAL	VDC activated	On	
VDC SIGNAL	VDC not activated	Off	
EBD FAIL SIG	In EBD fail-safe	On	
EDD FAIL SIG	EBD is normal	Off	
ABS FAIL SIG	In ABS fail-safe	On	
ADS FAIL SIG	ABS is normal	Off	
TCS FAIL SIG	In TCS fail-safe	On	
ICS FAIL SIG	TCS is normal	Off	
VDC FAIL SIG	In VDC fail-safe	On	
VDC FAIL SIG	VDC is normal	Off	_
CRANKING SIG	At cranking	On	F
CRAINKING SIG	Other than at cranking	Off	
FLUID LEV SW	When brake fluid level switch is ON (brake fluid level is less than the specified level)	On	
	When brake fluid level switch is OFF	Off	
	When parking brake is active	On	
PARK BRAKE SW	Parking brake is released	Off	
	When hill descent control is operating	On	
STP ON RLY	When hill descent control is not operating	Off	
DDC CUM(Note 3)	Hill descent control switch ON	On	
DDS SIW ^(Note 3)	Hill descent control switch OFF	Off	
and all (Note 3)	Hill descent control is active	On	
DDS SIG ^(Note 3)	Hill descent control is inactive	Off	
	Hill start assist is active	On	
USS SIG ^(Note 4)	Hill start assist is inactive	Off	

Note 1: Confirm tire pressure is standard value.

Note 2: Refer to BRC-143, "System Description" for ON/OFF conditions of each warning lamp and indicator lamp.

Note 3: DDS means "hill descent control."

Note 4: USS means "hill start assist."

Fail-Safe

INFOID:000000011152897

Μ

VDC FUNCTION, TCS FUNCTION AND HILL START ASSIST FUNCTION

Ν VDC warning lamp in combination meter turns ON when a malfunction occurs in the system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start Ο assist 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 the Ρ system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function, ABS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and hill start assist 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

< ECU DIAGNOSIS INFORMATION >

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

DTC	Malfunction detected condition	Fail-safe condition
C1101	When an open circuit is detected in rear RH wheel sensor circuit.	
C1102	When an open circuit is detected in rear LH wheel sensor circuit.	
C1103	When an open circuit is detected in front RH wheel sensor circuit.	
C1104	When an open circuit is detected in front LH wheel sensor circuit.	
C1105	 When 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. 	The following functions are sus- pended:
C1106	 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. 	 VDC function TCS function ABS function EBD function (only when both 2 rear wheels are malfunctioning
C1107	 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. 	hill start assist function
C1108	 When power supply voltage of front LH wheel sensor is low. When distance between front LH wheel sensor and front LH wheel sensor rotor is large. When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. 	
C1109	When ignition voltage is 10 V or less.When ignition voltage is 16 V or more.	The following functions are suspended:
C1111	When a malfunction is detected in motor or motor relay.	 VDC function TCS function ABS function EBD function hill start assist function
C1115	When difference in wheel speed between any wheel and others is detected during the vehicle is driven because of installation of other tires than specified.	The following functions are suspended:
C1116	When stop lamp switch signal is not input when brake pedal operates.	 VDC function TCS function ABS function hill start assist function
C1120	When a malfunction is detected in front LH ABS IN valve.	
C1121	When a malfunction is detected in front LH ABS OUT valve.	The following functions are sus-
C1122	When a malfunction is detected in front RH ABS IN valve.	pended:
C1123	When a malfunction is detected in front RH ABS OUT valve.	VDC functionTCS function
C1124	When a malfunction is detected in rear LH ABS IN valve.	ABS function
C1125	When a malfunction is detected in rear LH ABS OUT valve.	EBD function bill start assist function
C1126	When a malfunction is detected in rear RH ABS IN valve.	 hill start assist function
C1127	When a malfunction is detected in rear RH ABS OUT valve.	
C1130	When a malfunction is detected in ECM system.	 The following functions are suspended: VDC function TCS function hill start assist function

< ECU DIAGNOSIS INFORMATION >

DTC	Malfunction detected condition	Fail-safe condition
C1140	When a malfunction is detected in actuator relay.	The following functions are sus- pended: • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1142	When a malfunction is detected in pressure sensor.	The following functions are sus-
C1143	When a malfunction is detected in steering angle sensor.	pended:
C1144	When neutral position adjustment of steering angle sensor is not complete.	VDC functionTCS function
C1145	When a malfunction is detected in yaw rate signal.	 hill start assist function
C1146	When a malfunction is detected in side/decel G signal.	The following functions are sus-
C1155	When brake fluid level low signal is detected.	 pended: VDC function TCS function ABS function hill start assist function
C1160	When calibration of yaw rate/side/decel G sensor is not complete.	The following functions are suspended:VDC functionTCS functionhill start assist function
C1164	When a malfunction is detected in cut valve 1.	The following functions are sus-
C1165	When a malfunction is detected in cut valve 2.	pended: VDC function
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	 TCS function ABS function EBD function hill start assist function
C1197	When a malfunction is detected in vacuum sensor.	
C1198	 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. 	Electrical vacuum assistance of brake booster is suspended.
C1199	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.	
C119A	When a malfunction is detected in supply power voltage of vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.
U1000	When CAN communication signal is not continuously received for 2 seconds or more.	 The following functions are suspended: VDC function TCS function hill start assist function

DTC Inspection Priority Chart

INFOID:000000011152898

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

Priority	Detected item (DTC)	0
1	U1000 CAN COMM CIRCUIT	
2	C1170 VARIANT CODING	
3	C1130 ENGINE SIGNAL 1 C1144 ST ANG SEN SIGNAL	P
4	C1109 BATTERY VOLTAGE [ABNOMAL] C1111 PUMP MOTOR C1140 ACTUATOR RLY	

< ECU DIAGNOSIS INFORMATION >

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 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 C1121 FR RH OUT 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 C1127 RR RH OUT ABS SOL C1142 PRESS SEN CIRCUIT C1143 ST ANG SEN CIRCUIT C1146 SIDE G SEN CIRCUIT C1146 DECEL G SEN SET C1166 CV 2 C1197 VACUUM SENSOR C1199 BRAKE BOOSTER C1199 WACUUM SEN VOLT
6	C1155 BR FLUID LEVEL LOW

DIC Index

INFOID:000000011152899

DTC	Display Item	Refer to
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	PPC 105 "DTC Logic"
C1103	FR RH SENSOR-1	BRC-195, "DTC Logic"
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	PPC 100 "DTC Logic"
C1107	FR RH SENSOR-2	BRC-199, "DTC Logic"
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNOMAL]	BRC-201, "DTC Logic"
C1111	PUMP MOTOR	BRC-203, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-205, "DTC Logic"
C1116	STOP LAMP SW	BRC-207, "DTC Logic"
C1120	FR LH IN ABS SOL	BRC-209, "DTC Logic"
C1121	FR LH OUT ABS SOL	BRC-211, "DTC Logic"
C1122	FR RH IN ABS SOL	BRC-209, "DTC Logic"
C1123	FR RH OUT ABS SOL	BRC-211, "DTC Logic"
C1124	RR LH IN ABS SOL	BRC-209, "DTC Logic"
C1125	RR LH OUT ABS SOL	BRC-211, "DTC Logic"
C1126	RR RH IN ABS SOL	BRC-209, "DTC Logic"
C1127	RR RH OUT ABS SOL	BRC-211, "DTC Logic"

< ECU DIAGNOSIS INFORMATION >

[TYPE 2]

	Refer to	Display Item	DTC
— A	BRC-213, "DTC Logic"	ENGINE SIGNAL 1	C1130
	BRC-214, "DTC Logic"	ACTUATOR RLY	C1140
В	BRC-216, "DTC Logic"	PRESS SEN CIRCUIT	C1142
	BRC-218, "DTC Logic"	ST ANG SEN CIRCUIT	C1143
	BRC-220, "DTC Logic"	ST ANG SEN SIGNAL	C1144
С	PPC 221 "DTC Logic"	YAW RATE SENSOR	C1145
	BRC-221, "DTC Logic"	SIDE G SEN CIRCUIT	C1146
D	BRC-224, "DTC Logic"	BR FLUID LEVEL LOW	C1155
	BRC-226, "DTC Logic"	DECEL G SEN SET	C1160
	BRC-227, "DTC Logic"	CV 1	C1164
E	BRC-227, DTC LOUIC	CV 2	C1165
	BRC-229, "DTC Logic"	VARIANT CODING	C1170
BRO	BRC-230, "DTC Logic"	VACUUM SENSOR	C1197
	BRC-232, "DTC Logic"	VACUUM SEN CIR	C1198
	BRC-234, "DTC Logic"	BRAKE BOOSTER	C1199
G	BRC-236, "DTC Logic"	VACUUM SEN VOLT	C119A
	BRC-238, "DTC Logic"	CAN COMM CIRCUIT	U1000

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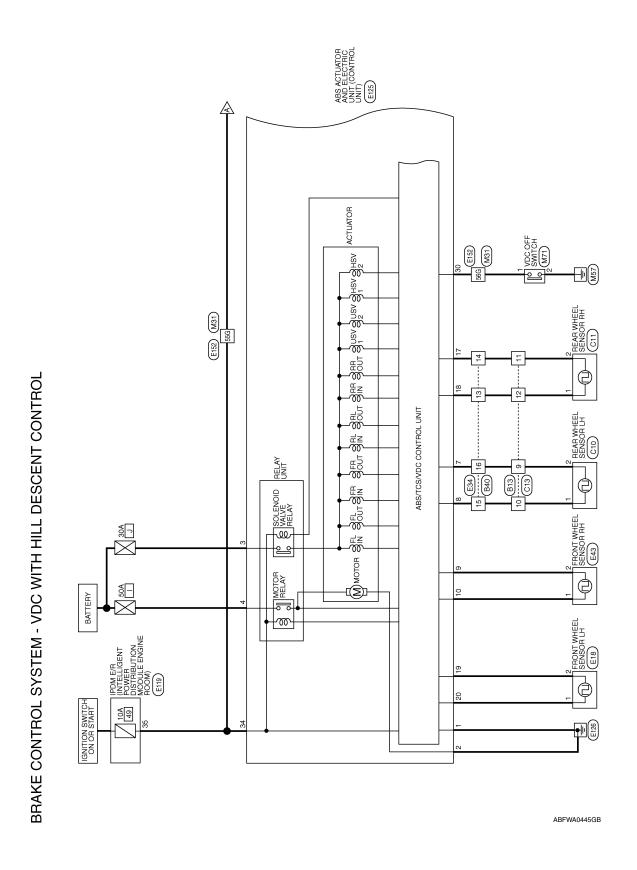
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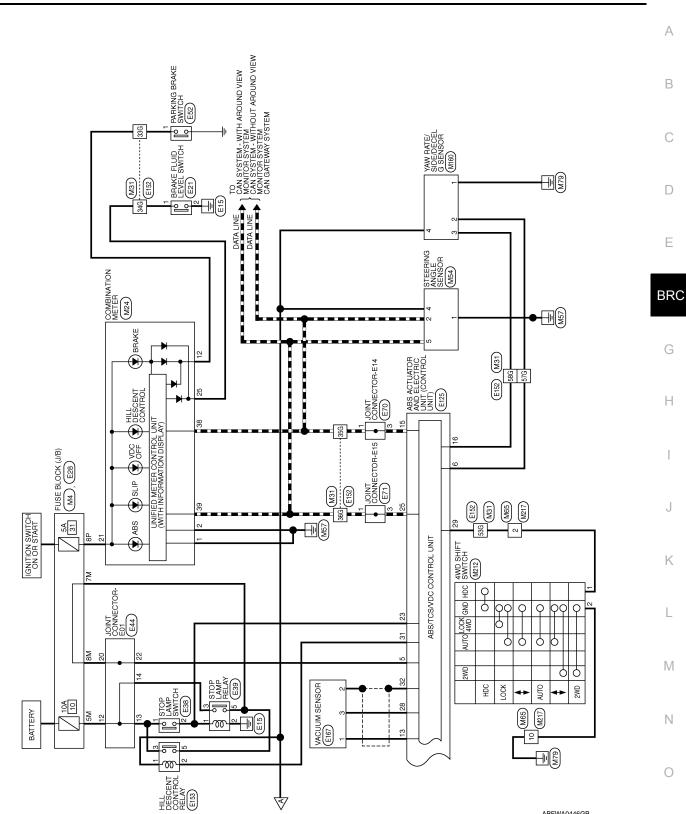
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WIRING DIAGRAM BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:000000011152900





[TYPE 2]

ABFWA0446GB

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33G G - - - - - - - - - - - 5 5 25 13 14
3019 18 17 16 11 10 9 8 7 6 9 8 7 6 1
88 37 36 34 38 34 38 34 38 32 28 27 26 25 Vitree Signal Name Signal Name - - - - - Color Color - - - - - - Color Color - - - - - Color Color - - - - Color Color - - - - Color - - - - - Color - - - - - Color - - - - -
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BRAKE CONTROL SYSTEM

Revision: September 2014

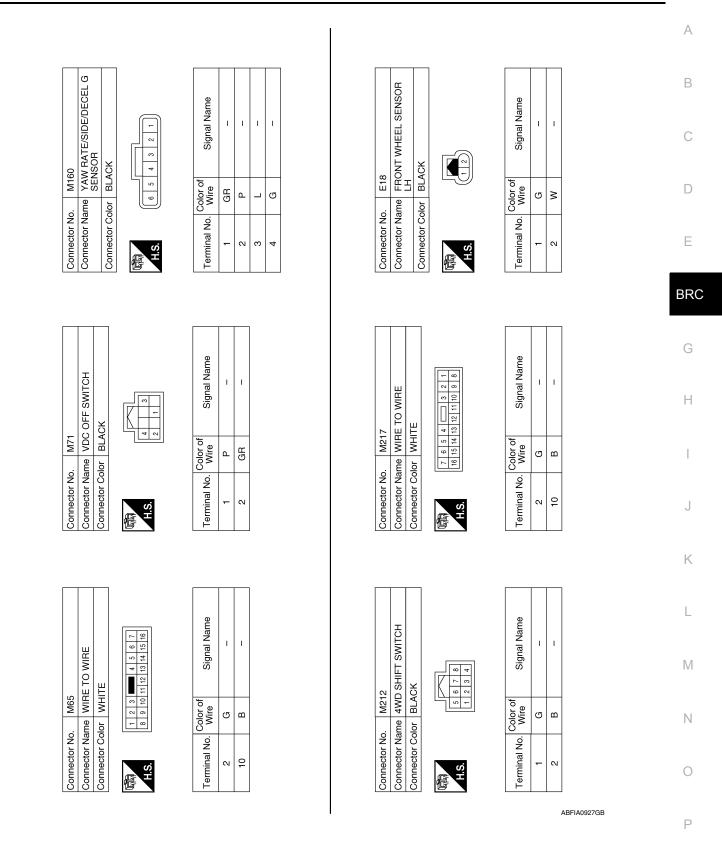
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91G 92G 93G 94G 96G 97G 98G 99G

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

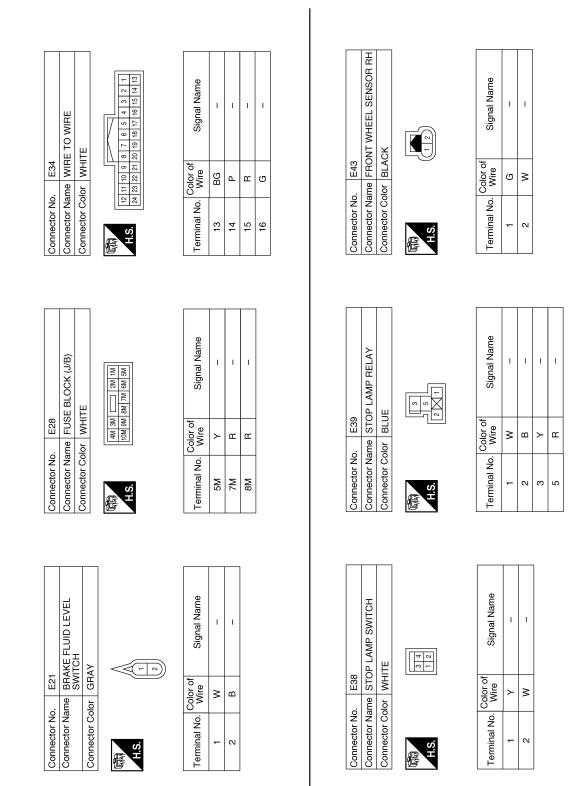
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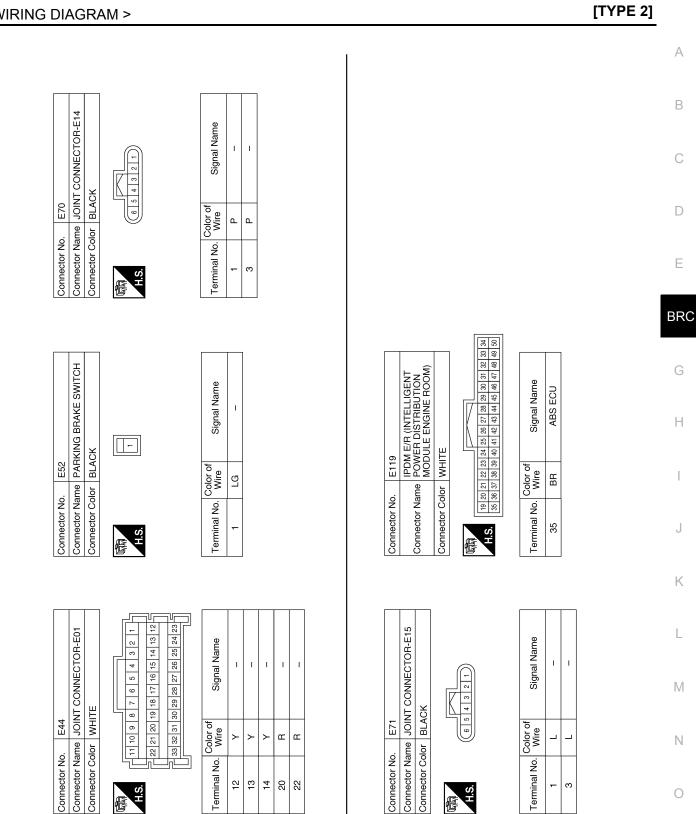


< WIRING DIAGRAM >

[TYPE 2]



ABFIA0928GB



BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

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ABFIA0929GB

E125 ABS ACTUATOR AND ELECTRIC UNIT	Terminal No. 6	Color of Wire P	Signal Name CANM2 (-)	Ter	Terminal No.	Color of Wire	Signal Name
	2	- J	RR LH SEN (SIGNAL)		22	1	1
	ω	æ	RR LH SEN (POWER)		23	2	STP2
	6	×	FR RH SEN (SIGNAL)		24	I	I
	10	σ	FR RH SEN (POWER)		25	_	CAN-H
	11	I	I		26	I	I
	12	I	I		27	I	I
	13	Μ	VAC SEN (SIGNAL)		28	В	VAC SEN (POWER)
	14	I	I		29	J	HDCS
	15	Ч	CAN-L		30	В	VDC OFF SW
	16	BG	CANM2 (+)		31	Μ	STPO
	17	٩	RR RH SEN (SIGNAL)		32	SHIELD	VAC SEN (GND)
	18	BG	RR RH SEN (POWER)		33	1	Ι
	19	3	FR LH SEN (SIGNAL)		34	BR	IGN (POWER)
	70	5					
	Terminal No.	Color of Wire	Signal Name	Con	Connector No.		
	33G	LG	I	50			RELAY
	34G	3	1	Col	Connector Color	lor BLUE	Е
	35G	٩.	1				
	36G	_	I	F			3
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	55G	BR	I			<u>'</u>	
	56G	æ	I	Į	-		
_	57G	٩	I	Ter	Terminal No.	Color of Wire	Signal Name
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BRAKE CONTROL SYSTEM

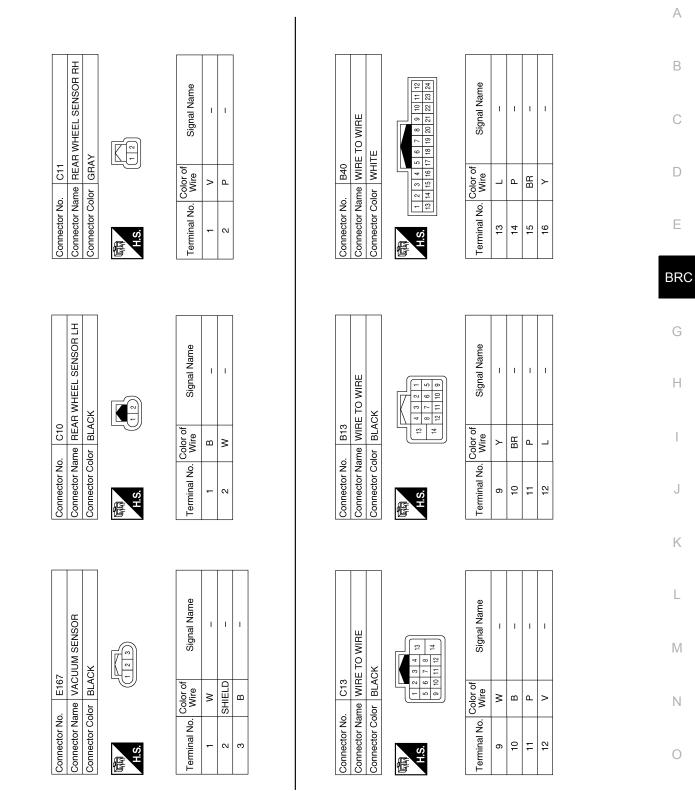
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[TYPE 2]

ABFIA0930GB

	BRAKE C	ONTROL SY	STEM	

[TYPE 2]



ABFIA0931GB

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BASIC INSPECTION APPLICATION NOTICE

Application Notice

INFOID:000000011645026

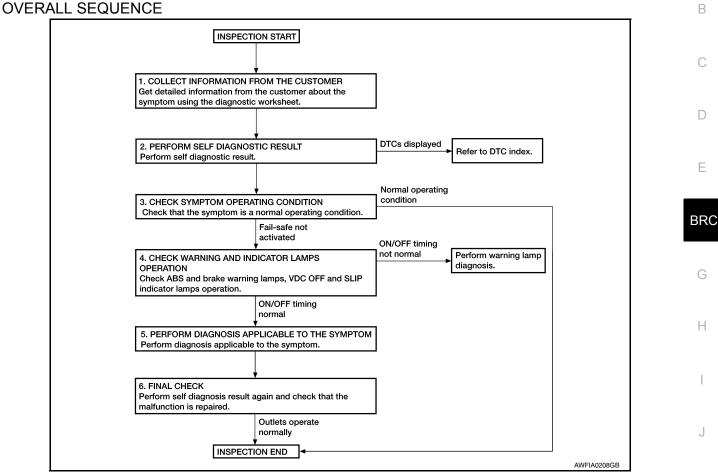
Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS

< BASIC INSPECTION >

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow





DETAILED FLOW

1.COLLECT INFORMATION FROM THE CUSTOMER

Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnostic worksheet. Refer to BRC-188, "Diagnostic Work Sheet".

>> GO TO 2.	M
2.PERFORM SELF-DIAGNOSTIC RESULT	
Perform self-diagnostic result. Refer to BRC-165, "CONSULT Function".	NI
Are any DTCs displayed?	Ν
YES >> Refer to <u>BRC-176, "DTC Index"</u> .	
NO >> GO TO 3.	\bigcirc
3. CHECK SYMPTOM OPERATING CONDITION	0
Check that the symptom is a normal operating condition. Refer to <u>BRC-257, "Description"</u> .	
Is the symptom a normal operating condition?	Ρ
YES >> Inspection End. NO >> GO TO 4.	
4. CHECK WARNING AND INDICATOR LAMPS OPERATION	
Check ABS and brake warning lamps, VDC OFF and SLIP indicator lamps operation. Refer to <u>BRC-143, "Sys-</u> tem <u>Description"</u> .	
Is ON/OFF timing normal?	

INFOID:000000011152901

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

YES >> GO TO 5.
 NO >> Perform warning lamp diagnosis. Refer to <u>BRC-244, "Component Function Check"</u> (ABS warning lamp), <u>BRC-245, "Component Function Check"</u> (brake warning lamp), <u>BRC-247, "Component Function Check"</u> (VDC OFF indicator lamp) or <u>BRC-248, "Component Function Check"</u> (SLIP indicator lamp).

5.PERFORM DIAGNOSIS APPLICABLE TO THE SYMPTOM

Perform diagnosis applicable to the symptom. Refer to <u>BRC-250, "Symptom Table"</u>.

>> GO TO 6.

6.FINAL CHECK

Perform self-diagnostic result again, and check that the malfunction is repaired. After checking, erase the selfdiagnosis memory. Refer to <u>BRC-165, "CONSULT Function"</u>.

>> Inspection End.

Diagnostic Work Sheet

INFOID:000000011152902

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

SFIA3265E

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

< BASIC INSPECTION > [TYPE 2]	
ADDITIONAL SERVICE WHEN REPLACING ABS ACTUATOR AND ELEC- TRIC UNIT (CONTROL UNIT)	А
Description	В
 After replacing the ABS actuator and electric unit (control unit), perform the following procedures: Neutral position adjustment for the steering angle sensor Calibration of the decel G sensor 	С
Work Procedure	
1. PERFORM THE NEUTRAL POSITION ADJUSTMENT FOR THE STEERING ANGLE SENSOR	D
Perform the neutral position adjustment for the steering angle sensor.	
>> Refer to <u>BRC-190, "Work Procedure"</u> , GO TO 2. 2.PERFORM CALIBRATION OF THE DECEL G SENSOR	E
Perform calibration of the decel G sensor.	BRC
>> Refer to <u>BRC-192, "Work Procedure"</u> .	G
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ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:000000011152905

[TYPE 2]

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

×: Required -: Not required

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

Work Procedure

INFOID:0000000011152906

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION CAUTION:

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

1.ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

2. Perform the neutral position adjustment for the steering angle sensor

1. On the CONSULT screen, touch "WORK SUPPORT" and "ST ANG SEN ADJUSTMENT" in order.

- 2. Touch "START". CAUTION: Do not touch steering wheel while adjusting steering angle sensor.
- After approximately 10 seconds, touch "END".
 NOTE: After approximately 60 seconds, it ends automatically.
- 4. Turn ignition switch OFF, then turn it ON again.
 - CAUTION: Be sure to perform above operation.

>> GO TO 3.

3. CHECK DATA MONITOR

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

Is the steering angle within the specified range?

YES >> GO TO 4.

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

4.ERASE THE SELF-DIAGNOSIS MEMORY

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

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION	
< BASIC INSPECTION > [TYPE 2]	_
 ABS actuator and electric unit (control unit): Refer to <u>BRC-165, "CONSULT Function"</u>. ECM: Refer to <u>EC-72, "CONSULT Function"</u> (USA and Canada) or <u>EC-581, "CONSULT Function"</u> (Mexico). 	A
Are the memories erased?	
YES >> Inspection End. NO >> Check the items indicated by the self-diagnosis.	В
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CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

CALIBRATION OF DECEL G SENSOR

Description

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

Situation	Calibration of decel G sensor
Removing/Installing ABS actuator and electric unit (control unit)	_
Replacing ABS actuator and electric unit (control unit)	x
Removing/Installing steering components	_
Replacing steering components	
Removing/Installing suspension components	_
Replacing suspension components	-
Removing/Installing tire	_
Replacing tire	_
Tire rotation	_
Adjusting wheel alignment	_
Removing/Installing yaw rate/side/decel G sensor	×
Replacing yaw rate/side/decel G sensor	×

Work Procedure

INFOID:000000011152908

CALIBRATION OF DECEL G SENSOR

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

1.ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

2. PERFORM CALIBRATION OF DECEL G SENSOR

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

>> GO TO 3.

3.CHECK DATA MONITOR

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to <u>BRC-165</u>, "CONSULT Function".
- ECM: Refer to EC-72, "CONSULT Function" (USA and Canada) or EC-581, "CONSULT Function" (Mexico).

BRC-192

2015 Pathfinder

INFOID:000000011152907

×: Required -: Not required

	CALIBRATION OF DECEL G SENSOR	
< BASI	C INSPECTION >	[TYPE 2]
	memories erased?	
YES	>> Inspection End.	А
NO	>> Inspection End. > Check the items indicated by the self-diagnosis.	
		В
		С
		D
		D
		E
		BRC
		G
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DTC/CIRCUIT DIAGNOSIS APPLICATION NOTICE

Application Notice

INFOID:000000011645027

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS

< DTC/CIRCUIT DIAGNOSIS >

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1101	RR RH SENSOR-1	 When power supply voltage of rear wheel sensor RH is low. When an open or shorted circuit is detected in rear wheel sensor RH circuit. 	
C1102	RR LH SENSOR-1	 When power supply voltage of rear wheel sensor LH is low. When an open or shorted circuit is detected in rear wheel sensor LH circuit. 	Harness or connectorWheel sensor
C1103	FR RH SENSOR-1	 When power supply voltage of front wheel sensor RH is low. When an open or shorted circuit is detected in front wheel sensor RH circuit. 	 ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	 When power supply voltage of front wheel sensor LH is low. When an open or shorted circuit is detected in front wheel sensor LH circuit. 	
DTC CO	ONFIRMATION PROCED	URE	
1. CHE	CK SELF-DIAGNOSTIC RE	SULT	
1. Star 2. Per	CONSULT. t engine and drive vehicle a form self-diagnostic result. C1101, C1102, C1103 or C1	t approximately 21 km/h (13 MPH) or more fo	or approximately 5 minutes.
YES NO		ocedure. Refer to <u>BRC-195, "Diagnosis Proc</u>	edure".
Diagno	osis Procedure		INFOID:000000011152910
Regardi	ng Wiring Diagram informati	on, refer to <u>BRC-178, "Wiring Diagram"</u> .	
1 .con	FIRM DTC		
	CONSULT	ABS and record all active DTCs.	
2. Clea	ar all DTCs.		
	Form DTC confirmation proce	edure. Refer to <u>BRC-195, "DTC Logic"</u> . C1104 reset?	
YES NO	>> GO TO 2.		
-	>> Refer to <u>GI-47, "Intermit</u> ECT WHEEL SENSOR		
	the suspect wheel sensor fo	r damage or deformation.	
	spection result normal?		
YES NO	>> GO TO 3.>> Repair or replace as new	cessarv.	
-	NESS AND CONNECTOR I	•	
		electric unit (control unit) connector E125 an	d wheel sensor connector of

[TYPE 2]

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< DTC/CIRCUIT DIAGNOSIS >

2. Check harness, connectors and terminals for corrosion, deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace as necessary.

4.CHECK WHEEL SENSOR OUTPUT SIGNAL

- 1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- 2. Turn on the ABS active wheel sensor tester power switch.
- NOTE:

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

3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash ON and OFF to indicate an output signal. **NOTE:**

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

- YES >> GO TO 5.
- NO >> Replace the wheel sensor. Refer to <u>BRC-258</u>, "Removal and Installation Front Wheel Sensor" or <u>BRC-260</u>, "Removal and Installation Rear Wheel Sensor".

5.CHECK WIRING HARNESS FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.

2. Check voltage between wheel sensor harness connector terminals of suspect wheel and ground.

Wheel Sensor		Ground	Valtaga		
Wheel	Connector	Terminal	Ground	Voltage	
Front LH	E18	1			
	EIO	2	_		
Front RH	E43	1			
	E43	2		0V	
Rear LH	C10	1		00	
Real LH	010	2			
Rear RH	C11	1			
Real RH	CII	2			

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair the circuit.

6.CHECK WIRING HARNESS FOR SHORT TO GROUND

1. Turn ignition switch OFF.

2. Check continuity between wheel sensor harness connector terminals of suspect wheel and ground.

Wheel Sensor			Ground	Continuity
Wheel	Connector	Terminal	Ground	Continuity

< DTC/CIRCUIT DIAGNOSIS >

Front LH	E18	1 2	_		А
Front RH	E43	1			
		2]	No	В
Rear LH	C10	1		NO	
	0.10	2			
Rear RH	C11	1			С
		2]		

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair the circuit.

7. CHECK WIRING HARNESS FOR SHORT BETWEEN CIRCUITS

Check continuity between wheel sensor harness connector terminals of suspect wheel.

Whe	el Sensor	(+) (-) Continuity		Continuity	
Wheel	Connector	Terminal	Terminal	Continuity	
Front LH	E18				-
Front RH	E43	4	2	No	
Rear LH	C10		2	INO	
Rear RH	C11				

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair the circuit.

8.check wiring harness for open circuit

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

Wheel sensor	ABS actuator and electric unit (control unit)		ctric unit (control unit) Wheel sensor		Continuity	
Wheel sensor	Connector	Terminal	Connector	Terminal		_
Front LH		20	E18 -	1		
		19	E IO	2		
Front RH		10	E43 -	1		
	E125	9	E43	2	Yes	
Rear LH	E 125	8	C10	1		
Real LH		7	010	2		
Rear RH		18	C11	1		
Redi RH		17	UII	2		

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair the circuit.

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

1. Turn ignition switch ON.

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

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< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

	and electric unit ol unit)	Ground	Condition	Voltage (Approx.)
Connector	Terminal			(Approx.)
E125	34		Ignition switch ON	Battery voltage
L125	E125 34	—	Ignition switch OFF	0V

Is the inspection result normal?

YES >> GO TO 10.

NO

- >> Check the following:
 - 10A fuse No. 49 located in the IPDM E/R
 - Harness between ABS actuator and electric unit (control unit) and IPDM E/R

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

1. Turn ignition switch OFF.

2. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals and ground.

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal		Continuity	
E125	1	Ground	Yes	
L 125	2	Giouna	165	

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace malfunctioning components.

11. CHECK WHEEL SENSOR INPUT VOLTAGE

- 1. Connect ABS actuator and electric unit (control unit) connector E125.
- 2. Turn ignition switch ON.
- 3. Check voltage between suspect wheel sensor harness connector terminals.

Whee	Sensor	(+)	(-)	Voltage
Wheel	Connector	Terminal	Terminal	(Approx.)
Front LH	E18			
Front RH	E43		2	Detter weltere
Rear LH	C10	I	2	Battery voltage
Rear RH	C11			

Is the inspection result normal?

- YES >> Replace wheel sensor. Refer to <u>BRC-258</u>, "<u>Removal and Installation Front Wheel Sensor</u>" or <u>BRC-260</u>, "<u>Removal and Installation Rear Wheel Sensor</u>". Then, GO TO 12.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u>, "<u>Removal and Installa-</u> tion".

12.CONFIRM REPAIR

With CONSULT

1. Clear all DTCs.

2. Perform DTC confirmation procedure. Refer to <u>BRC-195, "DTC Logic"</u>.

Does DTC C1101, C1102, C1103 or C1104 reset?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u>, "<u>Removal and Installa-</u> tion".
- NO >> Inspection End.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1105	RR RH SENSOR-2	 When distance between rear wheel sensor RH and rear wheel sensor RH rotor is large. When installation of rear wheel sensor RH or rear wheel sensor RH rotor is not normal. 	
C1106	RR LH SENSOR-2	 When distance between rear wheel sensor LH and rear wheel sensor LH rotor is large. When installation of rear wheel sensor LH or rear wheel sensor LH rotor is not normal. Wheel sensor LH rotor and e (antral write) 	
C1107	FR RH SENSOR-2	 When distance between front wheel sensor RH and front wheel sensor RH rotor is large. When installation of front wheel sensor RH or front wheel sensor RH rotor is not normal. 	(control unit) • Sensor rotor
C1108	FR LH SENSOR-2	 When distance between front wheel sensor LH and front wheel sensor LH rotor is large. When installation of front wheel sensor LH or front wheel sensor LH rotor is not normal. 	
DTC CC	ONFIRMATION PROCED	URE	
1. CHE	CK SELF-DIAGNOSTIC RE	SULT	
1. Star 2. Perf <u>s DTC (</u>	form self-diagnostic result. C1105, C1106, C1107 or C1		
YES NO	>> Proceed to diagnosis pr >> Inspection End.	ocedure. Refer to <u>BRC-199, "Diagnosis Proc</u>	<u>edure"</u> .
Diagno	osis Procedure		INFOID:000000011152912
Regardi	ng Wiring Diagram informati	on, refer to <u>BRC-178, "Wiring Diagram"</u> .	
1 .con	FIRM DTC		
	CONSULT		
2. Clea	ar all DTCs.	ABS and record all active DTCs. edure. Refer to <u>BRC-199, "DTC Logic"</u> .	
	<u>FC C1105, C1106, C1107 or</u>	<u>C1108 reset?</u>	
YES NO	>> GO TO 2. >> Refer to <u>GI-47</u> , "Intermit	tent Incident".	
2. сне	CK TIRE PRESSURE AND		
Check ti	res for excessive wear and	proper inflation. Refer to <u>WT-66, "Tire Air Pre</u>	ssure".
YES NO	spection result normal? >> GO TO 3. >> Repair or replace as new	cessary.	
J.CHE	CK WHEEL SENSOR		

Check wheel sensor for the following:

[TYPE 2]

A INFOID:000000011152911

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C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- Physical damage
- Contamination

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace as necessary.

4.CHECK SENSOR ROTOR

Check sensor rotor for the following:

- Contamination
- Physical damage (missing teeth, cracks, etc.)
- Foreign material
- Looseness

Is the inspection result normal?

- YES >> Replace the wheel sensor. Refer to <u>BRC-258</u>, "Removal and Installation Front Wheel Sensor" or <u>BRC-260</u>, "Removal and Installation Rear Wheel Sensor". Then, GO TO 5.
- NO >> Repair or replace as necessary.

5. CONFIRM REPAIR

- (I) With CONSULT
- 1. Clear all DTCs.
- 2. Perform DTC confirmation procedure. Refer to <u>BRC-199, "DTC Logic"</u>.

Does DTC C1105, C1106, C1107 or C1108 reset?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u>, "<u>Removal and Installa-</u> tion".
- NO >> Inspection End.

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1109 POWER AND GROUND SYSTEM

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item	Malfunctio	n detected condition	Possible causes
C1109	BATTERY VOLTAGE [ABNORMAL]	When ignition voltaWhen ignition volta	-	 Harness or connector ABS actuator and electric unit (control unit) Fuse Ignition power supply system Battery
		-		
	CK SELF-DIAGNOSTIC	RESULT		
. Turr	n the ignition switch OFF form self-diagnostic resu			
<u>s DTC (</u>	C1109 detected?			No
YES NO	> Proceed to diagnosis> Inspection End.	s procedure. Refer to <u>I</u>	<u> 3RC-201, "Diagnosis P</u>	<u>rocedure"</u> .
Diagno	osis Procedure			INFOID:000000011152914
Dogordi	ng Wiring Diagram infor	nation refer to PDC 1		
egaron	ng Wiring Diagram inforr	nation, refer to <u>BRC-1</u>	<u>78, Winng Diagram</u> .	
.CON	NECTOR INSPECTION			
	n ignition switch OFF. connect ABS actuator an	al a la atria consit (a a strad		
		a electric unit (control	unit) connectors.	
. Che	eck connectors and termi			ss or damage.
. Che <u>s the in:</u> YES	eck connectors and termi spection result normal? >> GO TO 2.	nals for deformation, d		ss or damage.
. Che <u>s the in:</u> YES NO	eck connectors and termi spection result normal? >> GO TO 2. >> Repair or replace as	nals for deformation, d necessary.	isconnection, loosenes	
. Che <u>s the ins</u> YES NO CHE	eck connectors and termi spection result normal? >> GO TO 2. >> Repair or replace as CK ABS ACTUATOR AN	nals for deformation, d necessary. D ELECTRIC UNIT (C	ONTROL UNIT) IGNIT	TION POWER SUPPLY CIRCUIT r E125 terminal 34 and ground.
. Che s <u>the in</u> YES NO .CHE Check v	eck connectors and termi spection result normal? >> GO TO 2. >> Repair or replace as CK ABS ACTUATOR AN	nals for deformation, d necessary. D ELECTRIC UNIT (C	ONTROL UNIT) IGNIT	TON POWER SUPPLY CIRCUIT r E125 terminal 34 and ground.
. Che <u>s the in:</u> YES NO CHE heck v ABS act	eck connectors and termi <u>spection result normal?</u> >> GO TO 2. >> Repair or replace as CK ABS ACTUATOR AN roltage between ABS act tuator and electric unit (control unit)	nals for deformation, d necessary. D ELECTRIC UNIT (C	ONTROL UNIT) IGNIT	ION POWER SUPPLY CIRCUIT
Che the in: YES NO .CHE heck v ABS act	eck connectors and termi <u>spection result normal?</u> >> GO TO 2. >> Repair or replace as CK ABS ACTUATOR AN roltage between ABS act tuator and electric unit (control unit) ctor Terminal	nals for deformation, d necessary. D ELECTRIC UNIT (C uator and electric unit	ONTROL UNIT) IGNIT	TION POWER SUPPLY CIRCUIT r E125 terminal 34 and ground.
Che the in: YES NO .CHE heck v ABS act Conne	eck connectors and termi spection result normal? >> GO TO 2. >> Repair or replace as CK ABS ACTUATOR AN roltage between ABS act tuator and electric unit (control unit) ector 5 34	nals for deformation, d necessary. D ELECTRIC UNIT (C uator and electric unit	ONTROL UNIT) IGNIT (control unit) connector Condition	TION POWER SUPPLY CIRCUIT r E125 terminal 34 and ground.
Che the in: YES NO .CHE heck v ABS act Conne E12 the in:	eck connectors and termi spection result normal? >> GO TO 2. >> Repair or replace as CK ABS ACTUATOR AN roltage between ABS act tuator and electric unit (control unit) ctor Terminal 5 34 spection result normal?	nals for deformation, d necessary. D ELECTRIC UNIT (C uator and electric unit	Isconnection, loosenes ONTROL UNIT) IGNIT (control unit) connector Condition	TION POWER SUPPLY CIRCUIT r E125 terminal 34 and ground.
Che the in: (ES NO .CHE) heck v ABS act Conne E12 the in: (ES NO	eck connectors and termi spection result normal? >> GO TO 2. >> Repair or replace as CK ABS ACTUATOR AN roltage between ABS act tuator and electric unit (control unit) sctor Terminal 5 34 spection result normal? >> GO TO 3. >> Repair or replace mail	nals for deformation, d necessary. D ELECTRIC UNIT (C uator and electric unit Ground —	ONTROL UNIT) IGNIT (control unit) connector Condition Ignition switch ON Ignition switch OFF	TION POWER SUPPLY CIRCUIT r E125 terminal 34 and ground. Voltage (Approx.) Battery voltage 0V
Che the in: YES NO .CHE heck v ABS act Conne E12 the in: YES	eck connectors and termi spection result normal? >> GO TO 2. >> Repair or replace as CK ABS ACTUATOR AN roltage between ABS act tuator and electric unit (control unit) sctor 5 34 spection result normal? >> GO TO 3. >> Repair or replace material	nals for deformation, d necessary. D ELECTRIC UNIT (C uator and electric unit Ground —	ONTROL UNIT) IGNIT (control unit) connector Condition Ignition switch ON Ignition switch OFF	TION POWER SUPPLY CIRCUIT r E125 terminal 34 and ground.
Che the in: (ES NO .CHE) heck v ABS act Conne E12 the in: (ES NO .CHE) heck v	eck connectors and termi spection result normal? >> GO TO 2. >> Repair or replace as CK ABS ACTUATOR AN roltage between ABS act tuator and electric unit (control unit) sctor 5 34 spection result normal? >> GO TO 3. >> Repair or replace matching CK ABS ACTUATOR AN	nals for deformation, d necessary. D ELECTRIC UNIT (C uator and electric unit Ground — alfunctioning compone D ELECTRIC UNIT (C	ONTROL UNIT) IGNIT (control unit) connector Condition Ignition switch ON Ignition switch OFF	TION POWER SUPPLY CIRCUIT r E125 terminal 34 and ground. Voltage (Approx.) Battery voltage 0V
. Che <u>s the in:</u> YES NO . CHE . CHE . Check v ABS act Conne E12 <u>s the in:</u> YES NO . CHE	eck connectors and termi spection result normal? >> GO TO 2. >> Repair or replace as CK ABS ACTUATOR AN roltage between ABS act tuator and electric unit (control unit) sctor 5 34 spection result normal? >> GO TO 3. >> Repair or replace matching CK ABS ACTUATOR AN	nals for deformation, d necessary. D ELECTRIC UNIT (C uator and electric unit Ground — alfunctioning compone D ELECTRIC UNIT (C ctuator and electric u	ONTROL UNIT) IGNIT (control unit) connector Condition Ignition switch ON Ignition switch OFF	TION POWER SUPPLY CIRCUIT r E125 terminal 34 and ground. Voltage (Approx.) Battery voltage 0V

[TYPE 2]

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INFOID:0000000011152913

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

E125	3	Battery voltage
L125	4	Ballery vollage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

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

1. Turn ignition switch OFF.

2. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 1, 2 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E125	1	Ground	Yes
E 125	2	Giouna	165

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u>, "<u>Removal and Installa-</u> <u>tion</u>".

NO >> Repair or replace malfunctioning components.

C1111 PUMP MOTOR

< DTC/CIRCUIT DIAGNOSIS >

C1111 PUMP MOTOR

DTC Logic

[TYPE 2]

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INFOID:000000011152915

DTC DETECTION LOGIC

C1111 DTC CO			
DTC CC	PUMP MOTOR	When a malfunction is detected in motor or motor re lay.	 Harness or connector ABS actuator and electric unit (control unit) Fusible link Battery power supply system
	NFIRMATION PROC	EDURE	
1. CHEC	K SELF-DIAGNOSTIC	RESULT	
1. Turn 2. Depr	CONSULT. ignition switch OFF. ess brake pedal 20 time the engine and wait for		
4. Perfo Is DTC C	orm self-diagnostic resu 21111 detected?	lt.	cedure"
	>> Inspection End.	s procedure. Refer to <u>BRC-203. "Diagnosis Pro</u>	<u>cedule</u> .
Diagno	sis Procedure		INFOID:00000001115291
1.CONM	NECTOR INSPECTION		
	ignition switch OFF.		
1. Turn 2. Disco	onnect ABS actuator an	d electric unit (control unit) connectors.	or damage
1. Turn 2. Disco 3. Cheo	onnect ABS actuator an	d electric unit (control unit) connectors. nals for deformation, disconnection, looseness	or damage.
1. Turn 2. Disco 3. Cheo <u>Is the ins</u> YES	onnect ABS actuator an ck connectors and termi pection result normal? >> GO TO 2.	nals for deformation, disconnection, looseness	or damage.
1. Turn 2. Disco 3. Cheo Is the ins YES NO	onnect ABS actuator an ck connectors and termi <u>pection result normal?</u> >> GO TO 2. >> Repair or replace as	nals for deformation, disconnection, looseness necessary.	or damage.
1. Turn 2. Disco 3. Cheo <u>Is the ins</u> YES NO 2. CHEC	onnect ABS actuator an ck connectors and termi <u>pection result normal?</u> >> GO TO 2. >> Repair or replace as CK ABS MOTOR AND N	nals for deformation, disconnection, looseness necessary. IOTOR RELAY BATTERY POWER SUPPLY	-
1. Turn 2. Disco 3. Cheo <u>Is the ins</u> YES NO 2. CHEC	onnect ABS actuator an ck connectors and termi <u>pection result normal?</u> >> GO TO 2. >> Repair or replace as CK ABS MOTOR AND N	nals for deformation, disconnection, looseness necessary.	-
1. Turn 2. Disco 3. Cheo <u>Is the ins</u> YES NO 2. CHEC	onnect ABS actuator an ck connectors and termi <u>pection result normal?</u> >> GO TO 2. >> Repair or replace as CK ABS MOTOR AND N	nals for deformation, disconnection, looseness necessary. IOTOR RELAY BATTERY POWER SUPPLY uator and electric unit (control unit) connector E	125 terminal 4 and ground.
1. Turn 2. Disco 3. Cheo <u>Is the ins</u> YES NO 2. CHEC	onnect ABS actuator an ck connectors and termi pection result normal? >> GO TO 2. >> Repair or replace as CK ABS MOTOR AND M oltage between ABS act	nals for deformation, disconnection, looseness necessary. IOTOR RELAY BATTERY POWER SUPPLY uator and electric unit (control unit) connector E	125 terminal 4 and ground.

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 1, 2 and ground.

C1111 PUMP MOTOR

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and ele	ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	_	Continuity
E125	1 Ground	Yes	
LIZJ	2	Giouna	163

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263, "Removal and Installa-</u> tion"

NO >> Repair or replace harness.

C1115 ABS SENSOR [ABNORMAL SIGNAL]

< DTC/CIRCUIT DIAGNOSIS >

C1115 ABS SENSOR [ABNORMAL SIGNAL]

DTC Logic

[TYPE 2]

INFOID:0000000011152917

DTC DI	ETECTION LOGIC		
DTC	Display Item	Malfunction detected condition	Possible causes
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When difference in wheel speed between any wheel and others is detected while the vehicle is driven be- cause of installation of tires other than specified.	 Harness or connector Wheel sensor Sensor rotor ABS actuator and electric unit (control unit)
DTC C	ONFIRMATION PROCED	URE	
1. CHE	CK SELF-DIAGNOSTIC RE	SULT	
1. Sta 2. Per	form self-diagnostic result. C1115 detected?	t approximately 30 km/h (19 MPH) or more fo ocedure. Refer to <u>BRC-205, "Diagnosis Proc</u>	
-	•		
Jiayili	osis Procedure		INFOID:000000011152918
Regardi	ng Wiring Diagram informati	on, refer to <u>BRC-178, "Wiring Diagram"</u> .	
4	DN: check between wheel sens NECTOR INSPECTION	sor terminals.	
whe 2. Che	el with DTC.	electric unit (control unit) connector E125 an n, disconnection, looseness or damage. cessary.	d wheel sensor connector of
2. сне	CK WHEEL SENSOR OUTF	PUT SIGNAL	
	n on the ABS active wheel se	or tester (J-45741) to wheel sensor using ap ensor tester power switch.	propriate adapter.
bati 3. Spir sen NO	ery in the ABS active wheel of the wheel of the vehicle by sor tester. The red SENSOR TE:	nould illuminate. If the POWER indicator doe sensor tester before proceeding. y hand and observe the red SENSOR indica R indicator should flash on and off to indicate	ator on the ABS active wheel an output signal.
lf th rete		uminates but does not flash, reverse the po	larity of the tester leads and
<u>Does th</u>	e ABS active wheel sensor t	ester detect a signal?	
YES NO		or. Refer to <u>BRC-258, "Removal and Installa</u> d Installation - Rear Wheel Sensor".	tion - Front Wheel Sensor" or

Check the inflation pressure, wear and size of each tire. Is the inspection result normal? А

C1115 ABS SENSOR [ABNORMAL SIGNAL]

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 4.

NO >> Adjust tire pressure, or replace tire(s).

4.CHECK WIRING HARNESS FOR SHORT CIRCUIT

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

	Wheel Sensor		Ground	Continuity	
Wheel	Connector	Terminal	Giouria	Continuity	
Front LH	E18	1		No	
	EIO	2			
Front RH	E43	1	1		
	E43	2			
Door	C10	1			
Rear LH	C10	2	-		
Rear RH	C11	1			
Real RH	GII	2	-		

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair the circuit.

5. CHECK WIRING HARNESS FOR OPEN CIRCUIT

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

Wheel sensor	ABS actuator and ele	ctric unit (control unit)	Wheel	sensor	Continuity
Wheel Sensor	Connector	Terminal	Connector	Terminal	
Front LH		20	E18	1	
TIONCEN		19	LIO	2	
Front RH	_	10	E43	1	
	E125	9	L43	2	Yes
Rear LH	L125	8	C10	1	
		7	010	2	
Rear RH		18	C11	1	
		17	011	2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-263, "Removal and Instal-</u><u>lation"</u>.

NO >> Repair the circuit.

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

DTC DETECTION LOGIC

C1116 STOP LAMP SWITCH

DTC Logic

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В

INFOID:000000011152919

[TYPE 2]

DTC Malfunction detected condition Possible causes **Display Item** · Harness or connector · Stop lamp switch · ABS actuator and electric unit When stop lamp switch signal is not input when brake STOP LAMP SW C1116 (control unit) pedal operates. D · Resistor (models without ICC system) · Battery power supply system Е DTC CONFIRMATION PROCEDURE 1. CHECK SELF-DIAGNOSIS RESULT BRC (P)With CONSULT 1. Erase self-diagnosis result for "ABS". 2. Turn the ignition switch OFF, and wait 10 seconds or more. 3. Start the engine. **CAUTION:** Never start the vehicle. 4. Depress the brake pedal several times. Н 5. Perform self-diagnosis for "ABS". Is DTC "C1116" detected? YES >> Refer to BRC-207, "Diagnosis Procedure". NO >> Inspection End. Diagnosis Procedure INFOID:000000011152920 Regarding Wiring Diagram information, refer to BRC-178, "Wiring Diagram". Κ **1**.CONNECTOR INSPECTION 1. Disconnect stop lamp relay connector and ABS actuator and electric unit (control unit) connector. Check terminals for deformation, disconnection, looseness or damage. 2. Is the inspection result normal? YES >> GO TO 2. Μ NO >> Repair or replace as necessary. 2.CHECK STOP LAMP SWITCH CIRCUIT Ν 1. Connect stop lamp relay connector. Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 5 and 2. ground. Ο

ABS actuator and ele	ectric unit (control unit)	Ground		Ground Condition Voltag		Voltage	•
Connector	Terminal	Cround	Condition	(Approx.)	F		
E125	5		Brake pedal depressed	Battery voltage			
E125	5	_	Brake pedal released	0V	-		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263, "Removal and Installa-</u> tion".

< DTC/CIRCUIT DIAGNOSIS >

$\mathbf{3}$. CHECK STOP LAMP RELAY CIRCUIT FOR OPEN

- 1. Disconnect stop lamp relay connector.
- 2. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 5 and stop lamp relay connector E39 terminal 5.

ABS actuator and ele	ectric unit (control unit)	Stop lamp relay		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E125	5	E39	5	Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace as necessary.

4.CHECK STOP LAMP RELAY CIRCUIT FOR SHORT

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 5 and ground.

ABS actuator and ele	ectric unit (control unit)	Ground	Continuity
Connector	Terminal	Ground	Continuity
E125	5	_	No

Is the inspection result normal?

YES >> Refer to EXL-107, "Work Flow".

NO >> Repair harness or connectors.

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Logic

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[TYPE 2]

INFOID:000000011152921 DTC DETECTION LOGIC В DTC Malfunction detected condition Possible causes **Display Item** When a malfunction is detected in front LH ABS IN C1120 FR LH IN ABS SOL valve. · Harness or connector When a malfunction is detected in front RH ABS IN C1122 FR RH IN ABS SOL · ABS actuator and electric unit valve. D (control unit) When a malfunction is detected in rear LH ABS IN · Fusible link C1124 **RR LH IN ABS SOL** valve · Battery power supply system Ε When a malfunction is detected in rear RH ABS IN C1126 RR RH IN ABS SOL valve. DTC CONFIRMATION PROCEDURE BRC CHECK SELF-DIAGNOSTIC RESULT (R)With CONSULT. Turn ignition switch OFF to ON. 1 Perform self-diagnostic result. 2. Is DTC C1120, C1122, C1124 or C1126 detected? Н YES >> Proceed to diagnosis procedure. Refer to <u>BRC-209</u>, "Diagnosis Procedure". NO >> Inspection End. Diagnosis Procedure INFOID:000000011152922 Regarding Wiring Diagram information, refer to BRC-178, "Wiring Diagram". **1.**CONNECTOR INSPECTION 1. Turn ignition switch OFF. 2. Disconnect ABS actuator and electric unit (control unit) connectors. Check connectors and terminals for deformation, disconnection, looseness or damage. 3. Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace as necessary. Μ 2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) BATTERY POWER SUPPLY Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 3 and ground. Ν ABS actuator and electric unit (control unit) Voltage (Approx.) Connector Terminal E125 3 Battery voltage Ground Is the inspection result normal? YES >> GO TO 3. Ρ NO >> Repair or replace malfunctioning components. 3.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 1, 2 and ground.

BRC-209

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E125	1	Ground	Yes
L 125	2	Giodila	103

Is the inspection result normal?

NO >> Repair or replace malfunctioning components.

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263, "Removal and Installa-</u> tion".

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Logic

А

[TYPE 2]

INFOID:000000011152923 DTC DETECTION LOGIC В DTC Malfunction detected condition Possible causes **Display Item** When a malfunction is detected in front LH ABS OUT FR LH OUT ABS SOL C1121 valve. · Harness or connector When a malfunction is detected in front RH ABS OUT C1123 FR RH OUT ABS SOL · ABS actuator and electric unit valve. D (control unit) When a malfunction is detected in rear LH ABS OUT · Fusible link C1125 **RR LH OUT ABS SOL** valve · Battery power supply system Ε When a malfunction is detected in rear RH ABS OUT C1127 RR RH OUT ABS SOL valve. DTC CONFIRMATION PROCEDURE BRC CHECK SELF-DIAGNOSTIC RESULT (R)With CONSULT. Turn ignition switch OFF to ON. 1 Perform self-diagnostic result. 2. Is DTC C1121, C1123, C1125 or C1127 detected? Н YES >> Proceed to diagnosis procedure. Refer to <u>BRC-211, "Diagnosis Procedure"</u>. NO >> Inspection End. Diagnosis Procedure INFOID:0000000011152924 Regarding Wiring Diagram information, refer to BRC-178, "Wiring Diagram". **1.**CONNECTOR INSPECTION 1. Turn ignition switch OFF. 2. Disconnect ABS actuator and electric unit (control unit) connectors. Check connectors and terminals for deformation, disconnection, looseness or damage. 3. Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace as necessary. Μ 2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) BATTERY POWER SUPPLY Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 3 and ground. Ν ABS actuator and electric unit (control unit) Voltage (Approx.) Connector Terminal E125 3 Battery voltage Ground Is the inspection result normal? YES >> GO TO 3. Ρ NO >> Repair or replace malfunctioning components. 3.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 1, 2 and

Revision: September 2014

ground.

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal		Continuity	
E125	1	Ground	Yes	
L 125	2	Ground	165	

Is the inspection result normal?

NO >> Repair or replace malfunctioning components.

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263, "Removal and Installa-</u> tion".

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

C1130 ENGINE SIGNAL

DTC Logic

[TYPE 2]

INFOID:000000011152925

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DTC	Display Item	Malfunction detected condition	Possible causes
C1130	ENGINE SIGNAL 1	When a malfunction is detected in ECM system.	 ECM ABS actuator and electric unit (control unit) CAN communication line
отс с	ONFIRMATION PROCE	EDURE	
1. CHE	CK SELF-DIAGNOSTIC I	RESULT	
I. Tur 2. Per	CONSULT. n ignition switch OFF to C form self-diagnostic resul [®] C1130 detected?		
YES NO		procedure. Refer to <u>BRC-213, "Diagnosis Pro</u>	ocedure".
Diagn	osis Procedure		INFOID:00000001115292
1.сне	CK SELF-DIAGNOSTIC I	RESULT FOR ENGINE SYSTEM	
Perform	CONSULT. self-diagnostic result. Re unction" (Mexico).	efer to <u>EC-72, "CONSULT Function"</u> (USA an	d Canada) or <u>EC-581, "CON</u>
Perform	self-diagnostic result. Re <u>unction"</u> (Mexico). <u>ECM DTCs detected?</u>	efer to <u>EC-72, "CONSULT Function"</u> (USA an <u>FC Index"</u> (USA and Canada) or <u>EC-610, "DTC</u>	
Perform SULT F Are any YES NO	 self-diagnostic result. Re<u>unction</u>" (Mexico). <u>ECM DTCs detected?</u> > Refer to <u>EC-105, "D1</u> > GO TO 2. 		<u>C Index"</u> (Mexico).
Perform SULT F Are any YES NO 2.CHE	 self-diagnostic result. Re<u>unction</u>" (Mexico). <u>ECM DTCs detected?</u> > Refer to <u>EC-105, "DT</u> > GO TO 2. CK SELF-DIAGNOSTIC I CONSULT. 	<u>FC Index"</u> (USA and Canada) or <u>EC-610, "DTC</u> RESULT FOR ABS ACTUATOR AND ELECTF	<u>C Index"</u> (Mexico).
Perform <u>SULT F</u> <u>Are any</u> YES NO 2. CHE With I. Per 2. Tur 3. Sta 4. Cho	 self-diagnostic result. Re<u>unction</u>" (Mexico). <u>ECM DTCs detected?</u> > Refer to <u>EC-105, "DT</u> > GO TO 2. CK SELF-DIAGNOSTIC I CONSULT. form self-diagnostic resultion switch OFF. rt engine and drive vehicle 	<u>FC Index</u> " (USA and Canada) or <u>EC-610, "DTC</u> RESULT FOR ABS ACTUATOR AND ELECTF t and erase DTCs. e for a short period of time. ator lamp (MIL) turns OFF.	<u>C Index"</u> (Mexico).
Perform <u>SULT F</u> <u>Are any</u> YES NO 2. CHE With . Per 2. Tur 3. Sta 4. Cho 5. Sto 5. Sto 5. Sto	 self-diagnostic result. Re<u>unction</u>" (Mexico). <u>ECM DTCs detected?</u> > Refer to <u>EC-105, "DT</u> > GO TO 2. CK SELF-DIAGNOSTIC I CONSULT. form self-diagnostic resulting ignition switch OFF. rt engine and drive vehicle eck that malfunction indication vehicle and perform self C1130 detected? 	TC Index" (USA and Canada) or EC-610, "DTO RESULT FOR ABS ACTUATOR AND ELECTF t and erase DTCs. e for a short period of time. ator lamp (MIL) turns OFF. f-diagnostic result.	<u>C Index"</u> (Mexico). RIC UNIT (CONTROL UNIT)
Perform <u>SULT F</u> <u>Are any</u> YES NO <u>2</u> .CHE <u>9</u> With 1. Per 2. Tur 3. Sta 4. Cho 5. Sto	 self-diagnostic result. Re<u>unction</u>" (Mexico). <u>ECM DTCs detected?</u> > Refer to <u>EC-105, "DT</u> > GO TO 2. CK SELF-DIAGNOSTIC I CONSULT. form self-diagnostic resulting ignition switch OFF. rt engine and drive vehicle eck that malfunction indication vehicle and perform self C1130 detected? 	<u>FC Index</u> " (USA and Canada) or <u>EC-610, "DTC</u> RESULT FOR ABS ACTUATOR AND ELECTF t and erase DTCs. e for a short period of time. ator lamp (MIL) turns OFF.	<u>C Index"</u> (Mexico). RIC UNIT (CONTROL UNIT)
Perform <u>SULT F</u> <u>Are any</u> YES NO 2. CHE With . Per 2. Tur 3. Sta 4. Cho 5. Sto 5. Sto 5. Sto	 self-diagnostic result. Re<u>unction</u>" (Mexico). <u>ECM DTCs detected?</u> > Refer to <u>EC-105, "DT</u> > GO TO 2. CK SELF-DIAGNOSTIC I CONSULT. form self-diagnostic result n ignition switch OFF. rt engine and drive vehicle eck that malfunction indication p vehicle and perform self C1130 detected? > Replace ABS actuated tion". 	TC Index" (USA and Canada) or EC-610, "DTO RESULT FOR ABS ACTUATOR AND ELECTR t and erase DTCs. e for a short period of time. ator lamp (MIL) turns OFF. f-diagnostic result. or and electric unit (control unit). Refer to BR and connection of connectors for abnormal con	<u>C Index"</u> (Mexico). RIC UNIT (CONTROL UNIT)
Perform <u>SULT F</u> <u>Are any</u> YES NO 2. CHE With I. Per 2. Tur 3. Sta 4. Cho 5. Sto 5. Sto 5	 self-diagnostic result. Re<u>unction</u>" (Mexico). <u>ECM DTCs detected?</u> > Refer to <u>EC-105, "DT</u> > GO TO 2. CK SELF-DIAGNOSTIC I CONSULT. form self-diagnostic resulter in ignition switch OFF. rt engine and drive vehicle eck that malfunction indicate pvehicle and perform self C1130 detected? > Replace ABS actuated tion". > Check pin terminals actuated to the self self. 	TC Index" (USA and Canada) or EC-610, "DTO RESULT FOR ABS ACTUATOR AND ELECTR t and erase DTCs. e for a short period of time. ator lamp (MIL) turns OFF. f-diagnostic result. or and electric unit (control unit). Refer to BR and connection of connectors for abnormal con	<u>C Index"</u> (Mexico). RIC UNIT (CONTROL UNIT)

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1140 ACTUATOR RELAY SYSTEM

DTC Logic

INFOID:000000011152927

[TYPE 2]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

(B) With CONSULT.

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

Is DTC C1140 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-214, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000011152928

Regarding Wiring Diagram information, refer to <u>BRC-178, "Wiring Diagram"</u>.

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

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

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminals 3, 4 and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		(Approx.)
E125	3	- Ground	Battery voltage
	4		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

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

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 1, 2 and ground.

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

ABS actuator and electric unit (control unit)			Continuity	A
Connector	Terminal	— Continuity		
E125	1	Ground	Yes	В
	2		165	D
le the inspection result por	nal?			

Is the inspection result normal?

YES	>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263, "Removal and Installa-</u>	С
	tion".	

NO >> Repair or replace malfunctioning components.

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< DTC/CIRCUIT DIAGNOSIS >

C1142 PRESS SENSOR

DTC Logic

INFOID:0000000011152929

INFOID:000000011152930

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULT

With CONSULT.

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

Is DTC C1142 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-216, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

1.CHECK STOP LAMP SWITCH SYSTEM

Check stop lamp switch system. Refer to <u>BRC-207, "Diagnosis Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning components.

2. CHECK BRAKE FLUID LEAKAGE

Check brake fluid leakage. Refer to BR-8, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

3.CHECK BRAKE PEDAL

Check brake pedal. Refer to <u>BR-7, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

4.CHECK HYDRAULIC BOOSTER ASSEMBLY

Check hydraulic booster assembly. Refer to <u>BR-10, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning components.

5.CHECK SELF DIAGNOSTIC RESULT

(I) With CONSULT.

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

C1142 PRESS SENSOR

< DTC/	/CIRCUIT DIAGNOSIS > [TYPE 2]	
	rform self-diagnostic result.	
<u>Is DTC</u>	C1142 detected?	A
YES	>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263. "Removal and Installa-</u> tion"	
NO	>> Inspection End.	В
		С
		D

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C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1143 STEERING ANGLE SENSOR

DTC Logic

INFOID:000000011152931

[TYPE 2]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

(I) With CONSULT.

1. Turn ignition switch OFF to ON.

2. Perform self-diagnostic result.

Is DTC C1143 detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-218, "Diagnosis Procedure"</u>.

NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000011152932

Regarding Wiring Diagram information, refer to <u>BRC-178, "Wiring Diagram"</u>.

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

2. CHECK STEERING ANGLE SENSOR MOUNTING CONDITION

Check steering angle sensor mounting condition.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

3.CHECK STEERING ANGLE SENSOR POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect steering angle sensor connector.
- 3. Turn ignition switch ON.
- 4. Check voltage between steering angle sensor connector M54 terminal 4 and ground.

Steering a	ngle sensor		Voltage
Connector	Connector Terminal		(Approx.)
M54	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

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NO >> GO TO 4.

4.CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect IPDM E/R connector E119.
- Check continuity between steering angle sensor connector M54 terminal 4 and IPDM E/R connector E119
 Between steering angle sensor connector M54 terminal 4 and IPDM E/R connector E119

Steering a	Steering angle sensor		IPDM E/R		С
Connector	Terminal	Connector	Terminal	Continuity	
M54	4	E119	35	Yes	D

4. Check continuity between steering angle sensor connector M54 terminal 4 and ground.

Steering angle sensor			Continuity	E
Connector	Terminal		Continuity	
M54	4	Ground	No	BRC
le the increation regult nerr				DI

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

NO >> Repair or replace malfunctioning components.

5. CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Check continuity between steering angle sensor connector M54 terminal 1 and ground.

Steering a	ingle sensor		Continuity	
Connector	Terminal		Continuity	I
M54	1	Ground	Yes	
s the inspection result nor	mal?	•		J

YES >> GO TO 6.

NO >> Repair or replace malfunctioning components.

6.CHECK CAN COMMUNICATION LINE

Check "STRG BRANCH LINE CIRCUIT". Refer to <u>LAN-141, "Diagnosis Procedure"</u> (Type 1) or <u>LAN-158,</u> "Diagnosis Procedure" (Type 2).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u>, "<u>Removal and Installa-</u> tion".

NO >> Repair or replace malfunctioning components.

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C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Logic

INFOID:000000011152933

[TYPE 2]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULT

(I) With CONSULT.

Turn ignition switch OFF to ON.

2. Perform self-diagnostic result.

Is DTC C1144 detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-220, "Diagnosis Procedure"</u>.

NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000011152934

1.ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to BRC-190, "Work Procedure".

>> GO TO 2.

2.CHECK SELF-DIAGNOSTIC RESULT

With CONSULT.

Perform self-diagnostic result.

<u>Is DTC C1144 detected?</u> YES >> GO TO 3.

NO >> Inspection End.

 ${\it 3.}$ Check steering angle sensor system

Check steering angle sensor system. Refer to BRC-218. "Diagnosis Procedure".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace malfunctioning components.

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

DTC Logic

INFOID:000000011152935

DTC	Display Item	Malfunction detected condition	Possible causes	
C1145	YAW RATE SENSOR	 When a malfunction is detected in yaw rate signal. When yaw rate signal is not continuously received for 2 seconds or more. When side G signal is not continuously received for 2 seconds or more. When decel G signal is not continuously received for 2 seconds or more. 	 Harness or connector Yaw rate/side/decel G sensor ABS actuator and electric unit (control unit) Ignition power supply system 	
C1146	SIDE G-SEN CIRCUIT	When a malfunction is detected in side/decel G sig- nal.	• Fuse	
		EDURE		
CHE	CK SELF-DIAGNOSTIC F	RESULT		
Turi Per	CONSULT. n ignition switch OFF to C form self-diagnostic result C1145 or C1146 detected	t.		
ES O		procedure. Refer to <u>BRC-221, "Diagnosis Proc</u>	edure".	
agno	osis Procedure		INFOID:000000011152936	
agno	osis Procedure		INFOID:000000011152936	
C		nation, refer to <u>BRC-178. "Wiring Diagram"</u> .	INFOID:000000011152936	
C	ng Wiring Diagram inform	nation, refer to <u>BRC-178, "Wiring Diagram"</u> .	INFOID:000000011152936	
gardi UTIC A mal urns ator	ng Wiring Diagram inform DN: Ifunction in yaw rate/sid during a spin turn, acce lamp is in ON status). T	de/decel G sensor system may be detected eleration turn or drift driving while VDC func This is not a malfunction if the status return	I when the vehicle sharply tion is OFF (VDC OFF indi- is to normal after engine is	
gardi UTIC A mal urns ator starte When or on	ng Wiring Diagram inform N: Ifunction in yaw rate/sid during a spin turn, acce lamp is in ON status). T d again. In that case, era the engine is in runnin a moving unit, SLIP ind	de/decel G sensor system may be detected eleration turn or drift driving while VDC func This is not a malfunction if the status return ase self-diagnosis result memory using CON g status and the vehicle is on a turntable at licator lamp may turn ON and "ABS" self-dia	I when the vehicle sharply tion is OFF (VDC OFF indi- is to normal after engine is ISULT. the entrance of parking lot agnosis may display "YAW	
gardi UTIC a mal urns ator tarte Vhen or on RATE vhen	ng Wiring Diagram inform N: Ifunction in yaw rate/sid during a spin turn, acce lamp is in ON status). T d again. In that case, era the engine is in runnin a moving unit, SLIP ind SENSOR". In this case the vehicle leaves the	de/decel G sensor system may be detected eleration turn or drift driving while VDC func This is not a malfunction if the status return ase self-diagnosis result memory using CON g status and the vehicle is on a turntable at	I when the vehicle sharply tion is OFF (VDC OFF indi- is to normal after engine is ISULT. the entrance of parking lot agnosis may display "YAW the status returns to normal	
gardi UTIC A mal urns ator starte When or on RATE vhen erase	ng Wiring Diagram inform N: Ifunction in yaw rate/sid during a spin turn, acce lamp is in ON status). T d again. In that case, era the engine is in runnin a moving unit, SLIP ind SENSOR". In this case the vehicle leaves the	de/decel G sensor system may be detected eleration turn or drift driving while VDC func This is not a malfunction if the status return ase self-diagnosis result memory using CON g status and the vehicle is on a turntable at licator lamp may turn ON and "ABS" self-dia s, yaw rate sensor is not malfunctioning. The turntable or moving unit and the engine is s	I when the vehicle sharply tion is OFF (VDC OFF indi- is to normal after engine is ISULT. the entrance of parking lot agnosis may display "YAW the status returns to normal	
gardi UTIC A mal urns ator tarte Vhen or on RATE vhen erase CON Turn Disc	ng Wiring Diagram inform DN: Ifunction in yaw rate/sid during a spin turn, acce lamp is in ON status). The d again. In that case, era the engine is in runnin a moving unit, SLIP ind SENSOR". In this case the vehicle leaves the self-diagnosis result mon NECTOR INSPECTION In ignition switch OFF. connect ABS actuator and	de/decel G sensor system may be detected eleration turn or drift driving while VDC func This is not a malfunction if the status return ase self-diagnosis result memory using CON g status and the vehicle is on a turntable at licator lamp may turn ON and "ABS" self-dia s, yaw rate sensor is not malfunctioning. The turntable or moving unit and the engine is s	I when the vehicle sharply tion is OFF (VDC OFF indi- is to normal after engine is ISULT. the entrance of parking lot agnosis may display "YAW he status returns to normal started again. In that case,	
gardi UTIC A mal urns ator starte When or on RATE vhen erase CON Turn Disc Che the in ES	ng Wiring Diagram inform DN: Ifunction in yaw rate/sid during a spin turn, acce lamp is in ON status). The d again. In that case, eractly the engine is in running a moving unit, SLIP indonesis SENSOR". In this case the vehicle leaves the form self-diagnosis result more NECTOR INSPECTION In ignition switch OFF. connect ABS actuator and eck connectors and terming spection result normal? >> GO TO 2.	de/decel G sensor system may be detected eleration turn or drift driving while VDC func This is not a malfunction if the status return ase self-diagnosis result memory using CON g status and the vehicle is on a turntable at licator lamp may turn ON and "ABS" self-dia e, yaw rate sensor is not malfunctioning. Th turntable or moving unit and the engine is se emory using CONSULT.	I when the vehicle sharply tion is OFF (VDC OFF indi- is to normal after engine is ISULT. the entrance of parking lot agnosis may display "YAW he status returns to normal started again. In that case,	
gardi UTIC A mal urns ator starte Vhen or on RATE vhen erase CON Turn Disc Che the in ES O	ng Wiring Diagram inform ON: Ifunction in yaw rate/sid during a spin turn, acce lamp is in ON status). The d again. In that case, era the engine is in running a moving unit, SLIP ind SENSOR". In this case the vehicle leaves the self-diagnosis result models NECTOR INSPECTION In ignition switch OFF. connect ABS actuator and eck connectors and termining spection result normal? >> GO TO 2. >> Repair or replace as	de/decel G sensor system may be detected eleration turn or drift driving while VDC func This is not a malfunction if the status return ase self-diagnosis result memory using CON g status and the vehicle is on a turntable at licator lamp may turn ON and "ABS" self-dia e, yaw rate sensor is not malfunctioning. The turntable or moving unit and the engine is se emory using CONSULT.	I when the vehicle sharply tion is OFF (VDC OFF indi- is to normal after engine is ISULT. the entrance of parking lot agnosis may display "YAW he status returns to normal started again. In that case,	
egardi AUTIC A mal urns cator starte When or on RATE when erase .CON Turn Disc Che the in ES IO	ng Wiring Diagram inform DN: Ifunction in yaw rate/sid during a spin turn, acce lamp is in ON status). The d again. In that case, era the engine is in runnin a moving unit, SLIP ind SENSOR". In this case the vehicle leaves the self-diagnosis result me NECTOR INSPECTION In ignition switch OFF. connect ABS actuator and eck connectors and termining spection result normal? >> GO TO 2. >> Repair or replace as CK YAW RATE/SIDE/DEC	de/decel G sensor system may be detected eleration turn or drift driving while VDC func This is not a malfunction if the status return ase self-diagnosis result memory using CON g status and the vehicle is on a turntable at licator lamp may turn ON and "ABS" self-dia e, yaw rate sensor is not malfunctioning. Th turntable or moving unit and the engine is se emory using CONSULT.	I when the vehicle sharply stion is OFF (VDC OFF indi- is to normal after engine is ISULT. the entrance of parking lot agnosis may display "YAW the status returns to normal started again. In that case,	

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

А

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.

- 2. Disconnect yaw rate/side/decel G sensor connector.
- 3. Turn the ignition switch ON.

4. Check voltage between yaw rate/side/decel G sensor connector M160 terminal 4 and ground.

Yaw rate/side/	decel G sensor		Voltage
Connector	Connector Terminal		(Approx.)
M160	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

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

 ${f 4}$.CHECK YAW RATE/SIDE/DECEL G SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Check continuity between yaw rate/side/decel G sensor connector M160 terminal 1 and ground.

Yaw rate/side/	decel G sensor		Continuity
Connector	Terminal		Continuity
M160	1	Ground	Yes

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning components.

5. CHECK COMMUNICATION LINES

1. Disconnect ABS actuator and electric unit (control unit) connector E125.

2. Check continuity between yaw rate/side/decel G sensor connector M160 terminals 2, 3 and ABS actuator and electric unit (control unit) connector E125 terminals 6, 16.

Yaw rate/side	/decel G sensor	ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M160	2	E125	6	Yes
IVI IOU	3	E125	16	Tes

3. Check continuity between yaw rate/side/decel G sensor connector M160 terminals 2, 3 and ground.

Yaw rate/side/	Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Ground	Continuity
M160	2		No
	3		NU

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning components.

6.CHECK COMMUNICATION LINES RESISTANCE

1. Connect ABS actuator and electric unit (control unit) connector E125.

2. Check resistance between yaw rate/side/decel G sensor connector M160 terminals 2, 3.

Yaw rate/side	/decel G sensor	Resistance
Connector	Terminal	Resistance
 M160	2	100 – 140 Ω
WING	3	100 - 140 22

Is the inspection result normal?

C1145 C1146 YAW RATE/SIDE/DECEL G SENSOR

	CTHU, CTHU TAW NATE/SIDE/DECLE & SENSON	
< DTC/	CIRCUIT DIAGNOSIS > [TYPE 2]	
YES NO	 >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-263, "Removal and Installation"</u>. >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263, "Removal and Installation"</u>. 	A
		В
		С
		D
		E
		BRC
		G
		Н
		I
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		L
		M
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C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

C1155 BRAKE FLUID LEVEL SWITCH

DTC Logic

INFOID:000000011152937

[TYPE 2]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

With CONSULT.

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

Is DTC C1155 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-224, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000011152938

Regarding Wiring Diagram information, refer to <u>BRC-178, "Wiring Diagram"</u>.

1. CHECK BRAKE FLUID LEVEL

1. Turn the ignition switch OFF.

Check brake fluid level. Refer to <u>BR-8. "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Refill brake fluid. Refer to <u>BR-16, "Drain and Refill"</u>.

2.connector inspection

- 1. Turn ignition switch OFF.
- 2. Disconnect combination meter connector M24 and brake fluid level switch connector E21.
- 3. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace as necessary.

3.CHECK BRAKE FLUID LEVEL SWITCH

Check brake fluid level switch. Refer to BRC-225, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace reservoir tank. Refer to <u>BR-29, "Disassembly and Assembly"</u>.

4.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.
- Check continuity between brake fluid level switch harness connector and combination meter harness connector.

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

	el switch	Combin	ation meter	Continuit		
Connector	Terminal	Connector	Terminal	Continuity		
E21	1	M24	25	Yes		
. Check continui	ty between bra	ake fluid level s	witch harness	connector and gr	ound.	
Droko flui	d loval owitch				_	
Connector	d level switch	al	_	Continuity		
E21	1		Ground	No		
s the inspection re	sult normal?			-	_	
YES >> GO TO						
	•	Ifunctioning co	•			
CHECK BRAKE	FLUID LEVEL	_ SWITCH GR	OUND CIRCU	Т		
Check continuity be	tween brake f	luid level switc	h harness conr	nector and groun	d.	
		1			_	
	d level switch		_	Continuity		
Connector E21	Termina 2		Ground	Yes	_	
	_		Ground	fes	_	
<u>s the inspection re</u> YES >> GO TC						
		Ifunctioning co	mpopopto			
	-	-	inponents.			
CHECK COMBI	NATION METE	ER	-	mal Refer to MV	/I-9 "METER SYSTEM	· Svs-
CHECK COMBI	NATION METE	ER	-	mal. Refer to <u>MV</u>	/I-9. "METER SYSTEM	<u>: Sys-</u>
CHECK COMBI	NATION METE	ER	-	mal. Refer to <u>MV</u>	/I-9. "METER SYSTEM	<u>: Sys-</u>
CHECK COMBI Check if indication em Description". the inspection re- YES >> Replac	NATION METE and operation sult normal?	ER of combination	n meter are nor		/I-9, "METER SYSTEM C-263, "Removal and Ir	
CHECK COMBI Check if indication <u>em Description"</u> . <u>s the inspection re</u> YES >> Replac <u>tion"</u> .	NATION METE and operation sult normal? e ABS actuate	ER of combination or and electric	n meter are nor unit (control un	nit). Refer to <u>BR(</u>	C-263, "Removal and Ir	
CHECK COMBI Check if indication <u>em Description</u> ". Sthe inspection res YES >> Replac tion". NO >> Replac	NATION METE and operation <u>sult normal?</u> e ABS actuato e combination	ER of combination or and electric	n meter are nor unit (control un		C-263, "Removal and Ir ation".	<u>istalla-</u>
CHECK COMBI Check if indication <u>em Description"</u> . <u>s the inspection re</u> YES >> Replac <u>tion"</u> .	NATION METE and operation <u>sult normal?</u> e ABS actuato e combination	ER of combination or and electric	n meter are nor unit (control un	nit). Refer to <u>BR(</u>	C-263, "Removal and Ir	<u>istalla-</u>
CHECK COMBI Check if indication <u>em Description</u> ". Sthe inspection res YES >> Replac tion". NO >> Replac	NATION METE and operation sult normal? e ABS actuato e combination pection	ER of combination or and electric meter. Refer to	n meter are nor unit (control un	nit). Refer to <u>BR(</u>	C-263, "Removal and Ir ation".	<u>istalla-</u>
CHECK COMBI Check if indication <u>em Description"</u> . <u>s the inspection reaction reaction</u> YES >> Replace <u>tion"</u> . NO >> Replace Component Insection	NATION METE and operation sult normal? e ABS actuato e combination pection FLUID LEVE	ER of combination or and electric meter. Refer to	n meter are nor unit (control un	nit). Refer to <u>BR(</u>	C-263, "Removal and Ir ation".	<u>istalla-</u>
CHECK COMBI Check if indication Em Description". S the inspection reaction YES >> Replace Tomponent Ins CHECK BRAKE Turn the ignitio Disconnect bra	NATION METE and operation sult normal? e ABS actuato e combination pection FLUID LEVEI n switch OFF. ke fluid level s	ER of combination or and electric meter. Refer to _ SWITCH	n meter are nor unit (control un o <u>MWI-85, "Re</u> connector.	nit). Refer to <u>BR(</u> moval and Install	C-263, "Removal and Ir ation".	<u>istalla-</u>
CHECK COMBI Check if indication Em Description". S the inspection res YES >> Replac Tion". NO >> Replac Component Ins .CHECK BRAKE . Turn the ignitio	NATION METE and operation sult normal? e ABS actuato e combination pection FLUID LEVEI n switch OFF. ke fluid level s	ER of combination or and electric meter. Refer to _ SWITCH	n meter are nor unit (control un o <u>MWI-85, "Re</u> connector.	nit). Refer to <u>BR(</u> moval and Install	C-263, "Removal and Ir ation".	<u>istalla-</u>
CHECK COMBI Check if indication Em Description". S the inspection res YES >> Replac TOMPONENT INS CHECK BRAKE . Turn the ignitio . Disconnect bra . Check continui	NATION METE and operation sult normal? e ABS actuato e combination pection FLUID LEVEI n switch OFF. ke fluid level s ty between ter	ER of combination or and electric meter. Refer to _ SWITCH	n meter are nor unit (control un o <u>MWI-85, "Re</u> connector.	nit). Refer to <u>BR(</u> moval and Install	C-263, "Removal and Ir ation".	<u>istalla-</u>
CHECK COMBI Check if indication <u>om Description</u> ". S the inspection re- YES >> Replace YES >> Replace NO >> Replace Component Ins .CHECK BRAKE . Turn the ignitio . Disconnect brau . Check continui	NATION METE and operation sult normal? e ABS actuato e combination pection FLUID LEVEI n switch OFF. ke fluid level s ty between ter	ER of combination or and electric meter. Refer to _ SWITCH switch harness minals of brake	n meter are nor unit (control un o <u>MWI-85, "Re</u> connector.	nit). Refer to <u>BR(</u> moval and Install	C-263, "Removal and Ir ation".	<u>istalla-</u>
CHECK COMBI Check if indication Em Description". S the inspection res YES >> Replac TOMPONENT INS CHECK BRAKE . Turn the ignitio . Disconnect bra . Check continui	NATION METE and operation sult normal? e ABS actuato e combination pection FLUID LEVEI n switch OFF. ke fluid level s ty between ter	ER of combination or and electric meter. Refer to SWITCH witch harness minals of brake	n meter are nor unit (control un o <u>MWI-85, "Re</u> connector. e fluid level swi	nit). Refer to <u>BR(</u> moval and Install tch.	C-263, "Removal and In ation".	<u>istalla-</u>
CHECK COMBI Check if indication <u>om Description</u> ". S the inspection re- YES >> Replace YES >> Replace NO >> Replace Component Ins .CHECK BRAKE . Turn the ignitio . Disconnect brau . Check continui	NATION METE and operation sult normal? e ABS actuato e combination pection FLUID LEVEI n switch OFF. ke fluid level s ty between ter	ER of combination or and electric meter. Refer to _ SWITCH switch harness minals of brake	n meter are nor unit (control un o <u>MWI-85, "Re</u> connector. e fluid level swi Condition	nit). Refer to <u>BR(</u> moval and Install tch. the specified level.	C-263, "Removal and In ation". INFOID:00000 Continuity	<u>istalla-</u>
CHECK COMBI Check if indication <u>em Description</u> ". S the inspection re- YES >> Replac Terminal CHECK BRAKE . Turn the ignitio Disconnect bra . Check continui	NATION METE and operation sult normal? e ABS actuato e combination pection FLUID LEVEI n switch OFF. ke fluid level s ty between ter	ER of combination or and electric meter. Refer to SWITCH witch harness minals of brake	n meter are nor unit (control un o <u>MWI-85, "Re</u> connector. e fluid level swi Condition	nit). Refer to <u>BR(</u> moval and Install tch. the specified level.	C-263, "Removal and In ation". INFOID:00000	<u>istalla-</u>
CHECK COMBI Check if indication <u>em Description</u> ". S the inspection re- YES >> Replac Terminal CHECK BRAKE . Turn the ignitio Disconnect bra . Check continui	NATION METE and operation sult normal? e ABS actuato e combination pection FLUID LEVEI n switch OFF. ke fluid level s ty between ter ch When brak level.	ER of combination or and electric meter. Refer to _ SWITCH switch harness minals of brake	n meter are nor unit (control un o <u>MWI-85, "Re</u> connector. e fluid level swi Condition	nit). Refer to <u>BR(</u> moval and Install tch. the specified level.	C-263, "Removal and In ation". INFOID:00000 Continuity	<u>istalla-</u>
CHECK COMBIN Check if indication Emposcription". Sthe inspection reaction reaction YES >> Replace YES >> Replace Component Ins CHECK BRAKE . Turn the ignitio . CHECK BRAKE . Turn the ignitio . Disconnect brace . Check continui Brake fluid level switt Terminal 1 – 2 Sthe inspection reaction reaction YES >> Inspection	NATION METE and operation sult normal? e ABS actuato e combination pection FLUID LEVEI n switch OFF. ke fluid level s ty between ter ch When brak level. sult normal? ion End.	ER of combination or and electric meter. Refer to SWITCH switch harness minals of brake	n meter are nor unit (control un o <u>MWI-85, "Re</u> connector. e fluid level swi Condition ervoir tank is within ervoir tank is less t	nit). Refer to <u>BR(</u> moval and Install tch. the specified level.	C-263, "Removal and Ir ation". INFOID:00000 Continuity No Yes	<u>istalla-</u>

C1160 DECEL G SEN SET

< DTC/CIRCUIT DIAGNOSIS >

C1160 DECEL G SEN SET

DTC Logic

INFOID:000000011152940

INFOID:0000000011152941

[TYPE 2]

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1160	DECEL G SEN SET	When calibration of yaw rate/side/decel G sensor is not complete.	 Yaw rate/side/decel G sensor Harness or connector ABS actuator and electric unit (control unit) Decel G sensor calibration is not performed

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

With CONSULT.

1. Turn ignition switch OFF to ON.

2. Perform self-diagnostic result.

Is DTC C1160 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-226, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

1.DECEL G SENSOR CALIBRATION

Perform decel G sensor calibration. Refer to BRC-192, "Work Procedure".

>> GO TO 2.

2.CHECK SELF-DIAGNOSTIC RESULT

BWith CONSULT. Perform self-diagnostic result.

Is DTC C1160 detected?

YES >> GO TO 3.

NO >> Inspection End.

 $\mathbf{3}$.check yaw rate/side/decel g sensor system

Check yaw rate/side/decel G sensor system. Refer to BRC-221, "Diagnosis Procedure".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace malfunctioning components.

C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1164, C1165 CV SYSTEM

DTC Logic

[TYPE 2]

А

INFOID:000000011152942

CHECK	^{7 2} FIRMATION PROC SELF-DIAGNOSTIC	When a malfunction is d When a malfunction is d EDURE		 Harness or connector ABS actuator and electric unit (control unit) Fusible link Battery power supply system
DTC CONI CHECK	FIRMATION PROC		etected in cut valve 2.	Fusible link
1. CHECK With CO 1. Turn ign 2. Perform	SELF-DIAGNOSTIC	EDURE		
With CO 1. Turn igi 2. Perforn				
1. Turn igi 2. Perforn		RESULT		
<u>IS DTC "C1'</u>	nition switch ON. n self-diagnostic resul			
YES >>	164" or "C1165" detect	<u>sted?</u> s procedure. Refer to <u>BR</u>	C-227 "Diagnosis Pro	cedure"
	Inspection End.			<u>occure</u> .
Diagnosis	s Procedure			INFOID:00000001115294
Regarding \	Viring Diagram inforn	nation, refer to <u>BRC-178</u>	, "Wiring Diagram".	
0 0	0 0			
1.CONNE	CTOR INSPECTION			
	nition switch OFF.			
		d electric unit (control ur		or damago
			connection, tooseness	or damage.
	GO TO 2.			
~	Repair or replace as	•		
2.CHECK	ABS ACTUATOR AN	D ELECTRIC UNIT (CO	NTROL UNIT) BATTE	RY POWER SUPPLY
	age between ABS a	ctuator and electric uni	t (control unit) connec	ctor E125 terminals 3, 4 and
ground.				
AE	S actuator and electric ur	it (control unit)		Voltage
Со	nnector	Terminal	—	(Approx.)
	E125	3	Ground	Battery voltage
	E125	4	Giouna	Dallely vollage
ls the inspe YES >> NO >>	<u>ction result normal?</u> GO TO 2. Repair or replace as	•		-
ground.				

Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 1, 2 and ground.

C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E125	1	Ground	Yes
L125	2	Ground	103

Is the inspection result normal?

NO >> Repair or replace malfunctioning components.

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u>, "<u>Removal and Installa-</u> tion".

C1170 VARIANT CODING

< DTC/CIRCUIT DIAGNOSIS >

C1170 VARIANT CODING

DTC Logic

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INFOID:000000011152944

DTC	Display Item	Malfunction detected condition	Possible causes	
C1170	VARIANT CODING	When the information in ABS actuator and electric unit (control unit) is not the same.	ABS actuator and electric unit (control unit)	С
	ONFIRMATION PROCE CK SELF-DIAGNOSTIC F			D
1. Tur 2. Per	CONSULT. n ignition switch ON. form self-diagnostic result C1170 detected?			E
YES NO		procedure. Refer to <u>BRC-229</u> , "Diagnosis Pro	cedure".	BRC
	osis Procedure		INFOID:000000011152945	G
Diagno		ND ELECTRIC UNIT (CONTROL UNIT)	INFOID:000000011152945	G
Diagno 1.REP Replace	LACE ABS ACTUATOR A	ND ELECTRIC UNIT (CONTROL UNIT) ic unit (control unit) even if other DTCs are dis		
Diagno 1.REP Replace	LACE ABS ACTUATOR A ABS actuator and electri self diagnostic result.		splayed with "VARIANT COD-	Н
Diagno 1.REP Replace	LACE ABS ACTUATOR A ABS actuator and electri self diagnostic result.	ic unit (control unit) even if other DTCs are dis	splayed with "VARIANT COD-	Н

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1197 VACUUM SENSOR

DTC Logic

INFOID:0000000011152946

[TYPE 2]

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1197	VACUUM SENSOR	When a malfunction is detected in vacuum sensor.	 Harness or connector Vacuum sensor (brake booster) Vacuum piping ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

(B) With CONSULT.

- 1. Turn the ignition switch ON.
- 2. Perform self-diagnostic result.

Is DTC C1197 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-230, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000011152947

Regarding Wiring Diagram information, refer to BRC-178, "Wiring Diagram".

1.CHECK BRAKE BOOSTER

- 1. Turn the ignition switch OFF.
- 2. Check brake booster. Refer to <u>BR-10, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace brake booster. Refer to <u>BR-31, "Removal and Installation"</u>.

2. CHECK VACUUM PIPING

Check vacuum piping. Refer to BR-33, "Exploded View".

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Replace vacuum piping. Refer to <u>BR-33, "Removal and Installation"</u>.

3.CHECK VACUUM SENSOR CIRCUIT

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

Vacuun	n sensor	ABS actuator and ele	ectric unit (control unit)	Continuity
Connector	Terminal	Connector	Terminal	Continuity
	1		13	
E167	2	E125	32	Yes
	3		28	

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

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

	im sensor		Continuity		A
Connector	Terminal		Continuity		
	1			-	В
E167	2	Ground	No		
	3			_	
s the inspection re					С
YES >> GO TO NO >> Repai	O 4. r or replace malfunct	tioning components			
1. CHECK TERM	•	tioning components.			D
		for damage or loose it (control unit) pin te		e or loose connection with har-	_
ness connector.			0		E
s the inspection re					
YES >> GO TO NO >> Repai	O 5. r or replace malfunct	tioning components			BF
D.REPLACE VAC	•	lioning components.			
_					(
With CONSULT . Connect ABS		c unit (control unit) ha	rness connector.		
2. Replace vacu		<u>BR-31, "Removal an</u>			
CAUTION: Always repla	ce brake booster b	ecause vacuum ser	nsor cannot be dis	assembled.	ŀ
 Erase self-dia 	gnosis result for "AB				
 Turn the ignition Start engine. 	on switch OFF.				
	liagnosis for "ABS".				I
<u>s DTC "C1197" de</u>	•				
	etected?	d electric unit (contro	ol unit). Refer to <u>B</u>	<u>RC-263. "Removal and Installa-</u>	 J
YES >> Repla <u>tion"</u> .	etected?	d electric unit (contro	ol unit). Refer to <u>BF</u>	RC-263, "Removal and Installa-	
YES >> Repla <u>tion"</u> .	ce ABS actuator and	d electric unit (contro	ol unit). Refer to <u>BF</u>	<u> RC-263. "Removal and Installa-</u>	ļ
YES >> Repla <u>tion"</u> .	ce ABS actuator and	d electric unit (contro	ol unit). Refer to <u>B</u>	<u>RC-263. "Removal and Installa-</u>	
YES >> Repla <u>tion"</u> .	ce ABS actuator and	d electric unit (contro	ol unit). Refer to <u>BF</u>	<u>RC-263. "Removal and Installa-</u>	
YES >> Repla <u>tion"</u> .	ce ABS actuator and	d electric unit (contro	ol unit). Refer to <u>BF</u>	<u>RC-263. "Removal and Installa-</u>	L
YES >> Repla <u>tion"</u> .	ce ABS actuator and	d electric unit (contro	ol unit). Refer to B	<u>RC-263. "Removal and Installa-</u>	I K
YES >> Repla <u>tion"</u> .	ce ABS actuator and	d electric unit (contro	ol unit). Refer to Br	<u>RC-263. "Removal and Installa-</u>	I K
YES >> Repla <u>tion"</u> .	ce ABS actuator and	d electric unit (contro	ol unit). Refer to <u>BF</u>	<u>RC-263, "Removal and Installa-</u>	L
YES >> Repla <u>tion"</u> .	ce ABS actuator and	d electric unit (contro	ol unit). Refer to Br	<u>RC-263. "Removal and Installa-</u>	L

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C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1198 VACUUM SENSOR

DTC Logic

DTC	Display Item	Malfunction detected condition	Possible causes
C1198	VACUUM SEN CIR	 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. 	 Harness or connector Vacuum sensor (brake booster) ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULT

() With CONSULT.

- 1. Turn the ignition switch ON.
- 2. Perform self-diagnostic result.

Is DTC C1198 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-232</u>, "Diagnosis Procedure".
- NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000011152949

Regarding Wiring Diagram information, refer to BRC-178, "Wiring Diagram".

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

Vacuun	Vacuum sensor ABS actuator and electric unit (control unit)		Continuity	
Connector	Terminal	Connector	Terminal	Continuity
	1		13	
E167	2	E125	32	Yes
	3	†	28	

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

Vacuun	n sensor		Continuity
Connector	Terminal	_	Continuity
	1		
E167	2	Ground	No
	3		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning components.

2.CHECK TERMINAL

INFOID:000000011152948

C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >	[TYPE 2]
 Check vacuum sensor pin terminals for damage or loose connection with harness connector. Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection ness connector. 	n with har-
Is the inspection result normal?	
YES $>>$ GO TO 3.	
NO >> Repair or replace malfunctioning components.	
3.REPLACE VACUUM SENSOR	
With CONSULT	
 Connect ABS actuator and electric unit (control unit) harness connector. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u>. 	
CAUTION:	
Always replace brake booster because vacuum sensor cannot be disassembled.	
3. Erase self-diagnosis result for "ABS".	
4. Turn the ignition switch OFF.	
 Start engine. Perform self-diagnosis for "ABS". 	
Is DTC "C1198" detected?	
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u> , "Removal ar	nd Installa-
tion".	
NO >> Inspection End.	

C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

C1199 BRAKE BOOSTER

DTC Logic

INFOID:0000000011152950

[TYPE 2]

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1199	BRAKE BOOSTER	When brake booster vacuum is approx. 0 kPa (0 mm- Hg) during engine running.	 Harness or connector Vacuum sensor (brake booster) Vacuum piping ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULT

(B) With CONSULT.

- 1. Turn the ignition switch ON.
- 2. Perform self-diagnostic result.

Is DTC C1199 detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-234</u>, "Diagnosis Procedure".
- NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000011152951

Regarding Wiring Diagram information, refer to <u>BRC-178, "Wiring Diagram"</u>.

1.CHECK BRAKE BOOSTER

- 1. Turn the ignition switch OFF.
- 2. Check brake booster. Refer to <u>BR-10, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace brake booster. Refer to <u>BR-31, "Removal and Installation"</u>.

2. CHECK VACUUM PIPING

Check vacuum piping. Refer to BR-33, "Exploded View".

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Replace vacuum piping. Refer to <u>BR-33, "Removal and Installation"</u>.

3.CHECK VACUUM SENSOR CIRCUIT

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

Vacuun	n sensor	ABS actuator and ele	ectric unit (control unit)	Continuity
Connector	Terminal	Connector	Terminal	Continuity
	1		13	
E167	2	E125	32	Yes
	3	+	28	

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

C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

Connector Terminal Continuity 1 1 Ground No 1 2 Ground No 1 3 Ground No 1 Sector Palace malfunctioning components. No 4.CHECK TERMINAL Check vacuum sensor pin terminals for damage or loose connection with harness connector. • Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with ness connector. Is the inspection result normal? YES YES > GO TO 5. NO >> Repair or replace malfunctioning components. 5.REPLACE VACUUM SENSOR @With CONSULT 1. Connect ABS actuator and electric unit (control unit) harness connector. 2. Replace vacuum sensor. Refer to BR-31, "Removal and Installation".	
E167 2 Ground No s the inspection result normal? YES >> GO TO 4. NO >> Repair or replace malfunctioning components. 4. CHECK TERMINAL • Check vacuum sensor pin terminals for damage or loose connection with harness connector. • Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with ness connector. • Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with ness connector. • Sthe inspection result normal? YES >> GO TO 5. NO >> Repair or replace malfunctioning components. 5. REPLACE VACUUM SENSOR © With CONSULT 1. Connect ABS actuator and electric unit (control unit) harness connector. 2. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u> .	
3 s the inspection result normal? YES >> GO TO 4. NO >> Repair or replace malfunctioning components. 4. CHECK TERMINAL Check vacuum sensor pin terminals for damage or loose connection with harness connector. Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with ness connector. s the inspection result normal? YES >> GO TO 5. NO >> Repair or replace malfunctioning components. D. REPLACE VACUUM SENSOR With CONSULT Connect ABS actuator and electric unit (control unit) harness connector. 2. Replace vacuum sensor. Refer to BR-31, "Removal and Installation".	
s the inspection result normal? YES >> GO TO 4. NO >> Repair or replace malfunctioning components. 4.CHECK TERMINAL Check vacuum sensor pin terminals for damage or loose connection with harness connector. Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with ness connector. s the inspection result normal? YES >> GO TO 5. NO >> Repair or replace malfunctioning components. D.REPLACE VACUUM SENSOR With CONSULT Connect ABS actuator and electric unit (control unit) harness connector. 2. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u> .	
YES >> GO TO 4. NO >> Repair or replace malfunctioning components. I.CHECK TERMINAL Check vacuum sensor pin terminals for damage or loose connection with harness connector. Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with ness connector. s the inspection result normal? YES >> GO TO 5. NO >> Repair or replace malfunctioning components. J.REPLACE VACUUM SENSOR With CONSULT Connect ABS actuator and electric unit (control unit) harness connector. Replace vacuum sensor. Refer to BR-31, "Removal and Installation".	
 NO >> Repair or replace malfunctioning components. CHECK TERMINAL Check vacuum sensor pin terminals for damage or loose connection with harness connector. Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with ness connector. a the inspection result normal? YES >> GO TO 5. NO >> Repair or replace malfunctioning components. D.REPLACE VACUUM SENSOR With CONSULT Connect ABS actuator and electric unit (control unit) harness connector. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u>. 	
CHECK TERMINAL Check vacuum sensor pin terminals for damage or loose connection with harness connector. Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with ness connector. the inspection result normal? YES >> GO TO 5. NO >> Repair or replace malfunctioning components. REPLACE VACUUM SENSOR With CONSULT Connect ABS actuator and electric unit (control unit) harness connector. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u> .	
Check vacuum sensor pin terminals for damage or loose connection with harness connector. Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with ness connector. s the inspection result normal? YES >> GO TO 5. NO >> Repair or replace malfunctioning components. D. REPLACE VACUUM SENSOR With CONSULT . Connect ABS actuator and electric unit (control unit) harness connector. e. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u> .	
Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with ness connector. <u>s the inspection result normal?</u> YES >> GO TO 5. NO >> Repair or replace malfunctioning components. D .REPLACE VACUUM SENSOR With CONSULT . Connect ABS actuator and electric unit (control unit) harness connector. 2. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u> .	
ness connector. <u>s the inspection result normal?</u> YES >> GO TO 5. NO >> Repair or replace malfunctioning components. D.REPLACE VACUUM SENSOR With CONSULT . Connect ABS actuator and electric unit (control unit) harness connector. 2. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u> .	bar
 YES >> GO TO 5. NO >> Repair or replace malfunctioning components. D.REPLACE VACUUM SENSOR With CONSULT 1. Connect ABS actuator and electric unit (control unit) harness connector. 2. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u>. 	nai-
 NO >> Repair or replace malfunctioning components. D.REPLACE VACUUM SENSOR With CONSULT Connect ABS actuator and electric unit (control unit) harness connector. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u>. 	_
	В
With CONSULT Connect ABS actuator and electric unit (control unit) harness connector. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u> .	
 Connect ABS actuator and electric unit (control unit) harness connector. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u>. 	
. Replace vacuum sensor. Refer to <u>BR-31, "Removal and Installation"</u> .	
CAUTION:	
Always replace brake booster because vacuum sensor cannot be disassembled.	
 B. Erase self-diagnosis result for "ABS". Turn the ignition switch OFF. 	
5. Start engine.	
6. Perform self-diagnosis for "ABS".	
s DTC "C1199" detected?	
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263, "Removal and Ins</u> tion".	<u>talla-</u>
NO >> Inspection End.	
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C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C119A VACUUM SENSOR

DTC Logic

INFOID:000000011152952

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C119A	VACUUM SEN VOLT	When a malfunction is detected in supply power voltage of vacuum sensor.	 Harness or connector Vacuum sensor (brake booster) ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULT

With CONSULT.

- 1. Turn the ignition switch ON.
- 2. Perform self-diagnostic result.

Is DTC C119A detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-236, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000011152953

Regarding Wiring Diagram information, refer to <u>BRC-178, "Wiring Diagram"</u>.

1.CHECK VACUUM SENSOR POWER SUPPLY

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

Vacuun	1 sensor		Voltage
Connector	Terminal		(Approx.)
E167	3	Ground	0 V

4. Turn the ignition switch ON.

CAUTION:

Never start engine.

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

Vacuun	Vacuum sensor		Voltage
Connector	Terminal		(Approx.)
E167	3	Ground	4.75 V – 5.25 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK VACUUM SENSOR POWER SUPPLY CIRCUIT

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

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

Vacuum	sensor	ABS actuator and	d electric unit (control unit) Continuity		А
Connector	Terminal	Connector	Terminal	Continuity		
E167	3	E125	28	Yes		В
4. Check cor	ntinuity betwe	een vacuum ser	nsor harness connec	tor and ground.		D
V	acuum sensor			0 11 11		С
Connector	Te	erminal	_	Continuity		
E167		3	Ground	No		-
s the inspection	on result nor	mal?				D
NO >> R	efer to <u>BRC-</u> epair or repla	<u>201, "Diagnosis</u>	Procedure". ng components.	t (control unit) p	ower supply and ground circuit.	E
I. Turn the ig	gnition switch	n OFF.	nsor harness connect	tor and ground.		BF
	<u>,</u>					
Connecto	Vacuum senso	r Terminal	_	Continuity		G
E167		2	Ground	Yes		
s the inspection		malO				ŀ
. СНЕСК ТЕ	RMINAL		ng components.			
Check ABS	actuator and		lamage or loose con ontrol unit) pin termi		ness connector. e or loose connection with har-	J
ness connects the inspection		mal?				
•			ectric unit (control u	nit). Refer to BF	C-263, "Removal and Installa-	k
<u>tic</u>	<u>on"</u> .					
NO >> R	epair or repla	ice maifunctioni	ng components.			
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U1000 CAN COMM CIRCUIT

Description

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

DTC Logic

DTC DETECTION LOGIC

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

Diagnosis Procedure

INFOID:0000000011152956

1. CHECK SELF-DIAGNOSTIC RESULT

With CONSULT.

Turn ignition switch ON.

2. Perform self-diagnostic result.

Is DTC U1000 detected?

YES >> Proceed to diagnosis procedure. Refer to LAN-21, "Trouble Diagnosis Flow Chart".

NO >> Refer to <u>GI-47, "Intermittent Incident"</u>.

INFOID:0000000011152954

INFOID:000000011152955

HILL DESCENT CONTROL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

HILL DESCENT CONTROL SWITCH

Description

The hill descent control switch activates (turn ON) the hill descent control function when the hill descent control switch is pressed.

Component Function Check

1. CHECK 4WD SHIFT SWITCH (HILL DESCENT CONTROL SWITCH) OPERATION

Turn ON/OFF the hill descent control switch and check that the hill descent control indicator lamp in the combination meter turns ON/OFF correctly.

C	ondition	Hill desce	ent control indicat tion status			Е
Hill descent cor	ntrol switch: ON		ON			
Hill descent cor	ntrol switch: OFF		OFF			BRC
Is the inspecti	on result norn	nal?				DILO
	spection End to to diagnosis	s procedure. F	Refer to <u>BRC-2</u>	239, "Diagnosi	s Procedure".	G
Diagnosis	Procedure				INFOID:000000011657513	-
						Н
Regarding Wiring Diagram information, refer to BRC-178. "Wiring Diagram".						
1. CHECK 4W	VD SHIFT SW	/ITCH (HILL D	DESCENT CO	NTROL SWIT	CH)	I
Perform the h	ill descent cor	ntrol switch co	mponent insp	ection. Refer t	o BRC-240, "Component Inspection".	
Is the inspecti	on result norn	nal?				J
. = • •	O TO 2	((1				
~	eplace hill de					К
Z.CHECK 4V	VD SHIFT SW	/ITCH (HILL E	DESCENT CO	NTROL SWIT	CH) HARNESS	
				unit) connecto		
	ntinuity betwe			c unit (control	unit) connector E125 terminal 29 and hill	L
uescent c						
ABS actuator a	and electric unit					ЪЛ
	ol unit)	Hill descent	control switch	Continuity		Μ
Connector	Terminal	Connector	Terminal			

3. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 29 and ground.

1

Yes

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal		Continuity	
E125	29	Ground	No	

M212

Is the inspection result normal?

YES >> GO TO 3

E125

NO >> Repair or replace harness.

29

3.CHECK 4WD SHIFT SWITCH (HILL DESCENT CONTROL SWITCH) GROUND

Check continuity between hill descent control switch connector M212 terminal 2 and ground.

BRC-239

INFOID:000000011657511

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HILL DESCENT CONTROL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

Hill descent	lescent control switch		Continuity
Connector	Terminal		Continuity
M212	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace harness.

4.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-18, "Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263. "Removal and Installa-</u> tion".

NO >> Replace combination meter. Refer to <u>MWI-85, "Removal and Installation"</u>.

Component Inspection

INFOID:000000011657514

1.CHECK 4WD SHIFT SWITCH (HILL DESCENT CONTROL SWITCH)

1. Turn ignition switch OFF.

- 2. Disconnect hill descent control switch connector.
- 3. Check continuity between hill descent control switch terminals.

Hill descent control switch terminals	Condition	Continuity
1 – 2	Hill descent control switch is ON.	Yes
1 – 2	Hill descent control switch is OFF.	No

Is the inspection result normal?

YES >> Inspection End

NO >> Replace hill descent control switch. Refer to <u>BRC-267</u>, "Removal and Installation"

Special Repair Requirement

INFOID:000000011657515

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-190</u>, "<u>Description</u>".

>> GO TO 2

2.calibration of decel g sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-192</u>, "<u>Description</u>".

>> END

PARKING BRAKE SWITCH

DTC/CIRCUIT DIAG	SNOSIS >				[TYPE 2]
PARKING BRAK	KE SWITCH				
Description					INFOID:000000011152957
Fransmits the parking I	orake switch signa	to the combi	nation meter.		
Component Funct	-				INFOID:000000011152958
1.COMBINATION ME		Λ1			
1. Start engine.	TER INFOT SIGN	AL			
2. Monitor BRAKE W	/L in DATA MONIT	OR while ap	olying and releasin	ng the parking br	rake.
Condition	CONS	ULT			
Parking brake	applied : ON				
Parking brake	released : OFF				
>> Inspection	End				
>> Inspection					
iagnosis Proced	ure				INFOID:000000011152959
egarding Wiring Diag	ram information, re	eter to <u>MWI-3</u>	1, "Wiring Diagran	<u>n"</u> .	
. Disconnect combir	nation meter harne	ss connector			rness connector E52.
. Disconnect combir	nation meter harne between combinat	ss connector ion meter ha			rness connector E52. 2 and parking brake
 Disconnect combination Check continuity switch harness continuity 	nation meter harne between combinat nnector E52 termir	ss connector ion meter ha	irness connector	M24 terminal 1	
 Check continuity switch harness con Combination 	nation meter harne between combinat nnector E52 termin	ss connector ion meter ha al 1.	Parking brake swit	M24 terminal 1	
 Disconnect combin Check continuity switch harness continuity 	nation meter harne between combinat nnector E52 termir	ss connector ion meter ha al 1. Con	irness connector	M24 terminal 1	2 and parking brake
Disconnect combin Check continuity switch harness con Combinati	nation meter harne between combinat nnector E52 termin on meter Terminal 12	ss connector ion meter ha al 1. Con	Parking brake swit	M24 terminal 1 tch Terminal 1	2 and parking brake Continuity Yes
Disconnect combin Check continuity switch harness con Combinati Connector M24 . Check continuity b	nation meter harne between combinat nnector E52 termin on meter Terminal 12 etween combinatio	ss connector ion meter ha al 1. Con	Parking brake swit	M24 terminal 1 tch Terminal 1	2 and parking brake Continuity Yes
Disconnect combin Check continuity I switch harness con Combinati Connector M24 Check continuity b Cor	nation meter harne between combinat nnector E52 termin on meter Terminal 12 etween combination	ss connector ion meter ha al 1. Con Eon meter harr	Parking brake swit	M24 terminal 1 tch Terminal 1	2 and parking brake Continuity Yes
Disconnect combin Check continuity is switch harness con Combinati Connector M24 Check continuity b Con Con	nation meter harne between combinat nnector E52 termin on meter Terminal 12 etween combination mbination meter	ss connector ion meter ha al 1. Con E on meter harr	Parking brake swit	M24 terminal 1 tch Terminal 1	2 and parking brake Continuity Yes Ind ground. Continuity
Disconnect combin Check continuity is switch harness con Combinati Connector M24 Check continuity b Cor Connector M24	nation meter harne between combinat nnector E52 termin on meter Terminal 12 etween combination mbination meter Term 1	ss connector ion meter ha al 1. Con Eon meter harr	Parking brake swit	M24 terminal 1 tch Terminal 1	2 and parking brake Continuity Yes and ground.
Disconnect combin Check continuity I switch harness con Combinati Connector M24 Check continuity b Con Con Con Con Con Con Con Con Con Con	nation meter harne between combinat nnector E52 termin on meter Terminal 12 etween combination mbination meter Term 1 normal?	ss connector ion meter ha al 1. Con E on meter harr	Parking brake swit	M24 terminal 1 tch Terminal 1	2 and parking brake Continuity Yes Ind ground. Continuity
Disconnect combin Check continuity I switch harness con Combinati Connector M24 Check continuity b Cor Connector M24 the inspection result YES >> Inspection	nation meter harne between combinat nnector E52 termin on meter Terminal 12 etween combination mbination meter Term 1 normal?	ss connector ion meter ha al 1. Con E on meter harr	Parking brake swit	M24 terminal 1 tch Terminal 1	2 and parking brake Continuity Yes Ind ground. Continuity
Disconnect combin Check continuity is switch harness con Combinati Connector M24 Check continuity b Cor Connector M24 the inspection result YES >> Inspection NO >> Repair or r	nation meter harne between combination on meter Terminal 12 retween combination mbination meter 1 normal? End. replace harness or	ss connector ion meter ha al 1. Con E on meter harr	Parking brake swit	M24 terminal 1 tch Terminal 1	2 and parking brake Continuity Yes Ind ground. Continuity
Disconnect combin Check continuity I switch harness con Combinati Connector M24 Check continuity b Cor Connector M24 the inspection result YES >> Inspection NO >> Repair or r Component Inspe	nation meter harne between combination on meter Terminal 12 etween combination mbination meter 1 normal? End. replace harness or Ction	ss connector ion meter ha al 1. Con E on meter harr	Parking brake swit	M24 terminal 1 tch Terminal 1	2 and parking brake Continuity Yes and ground. Continuity No
Disconnect combin Check continuity I switch harness con Combinati Connector M24 Check continuity b Cor Connector M24 the inspection result YES >> Inspection NO >> Repair or r Component Inspe .CHECK PARKING F	nation meter harne between combination on meter Terminal 12 etween combination mbination meter Commal? End. replace harness or Ction BRAKE SWITCH	ss connector ion meter ha al 1. Con E on meter harr	Parking brake swit nector 52 ess connector M2 Ground	M24 terminal 1 tch Terminal 1 4 terminal 12 ar	2 and parking brake Continuity Yes and ground. Continuity No
Disconnect combin Check continuity is switch harness con Combinati Connector M24 Check continuity b Cor Connector M24 Sthe inspection result YES >> Inspection NO >> Repair or r Component Inspe .CHECK PARKING F	nation meter harne between combination on meter Terminal 12 etween combination mbination meter Commal? End. replace harness or Ction BRAKE SWITCH	ss connector ion meter ha al 1. Con E on meter harr	Parking brake swit nector 52 ess connector M2 Ground	M24 terminal 1 tch Terminal 1 4 terminal 12 ar	2 and parking brake Continuity Yes and ground. Continuity No
Disconnect combin Check continuity is switch harness con Combinati Connector M24 Con Connector M24 Connector M24 Sthe inspection result YES >> Inspection	nation meter harne between combination on meter Terminal 12 etween combination mbination meter Commal? End. replace harness or Ction BRAKE SWITCH	ss connector ion meter ha al 1. Con E on meter harr hinal 2 connectors.	Parking brake swit nector 52 ess connector M2 Ground	M24 terminal 1 tch Terminal 1 4 terminal 12 ar	2 and parking brake Continuity Yes and ground. Continuity No
Disconnect combin Check continuity is switch harness con Combinati Connector M24 Check continuity b Cor Connector M24 Sthe inspection result YES >> Inspection NO >> Repair or r Component Inspe .CHECK PARKING F Check continuity betwee Component	nation meter harne between combination on meter Terminal 12 etween combination mbination meter End. Teplace harness or CtiON BRAKE SWITCH Een parking brake so	ss connector ion meter ha al 1. Con E on meter harr hinal 2 connectors.	Parking brake swit nector 52 ess connector M2 Ground	M24 terminal 1 tch Terminal 1 24 terminal 12 ar 4 terminal 12 ar 58 ground.	2 and parking brake Continuity Yes ad ground. Continuity No
Disconnect combin Check continuity is switch harness con Combinati Connector M24 Check continuity b Cor Connector M24 Sthe inspection result YES >> Inspection NO >> Repair or r Component Inspe .CHECK PARKING I Check continuity between	nation meter harne between combination on meter Terminal 12 etween combination mbination meter End. Teplace harness or CtiON BRAKE SWITCH Een parking brake so	ss connector ion meter ha al 1. Con E on meter harr hinal 2 connectors.	Parking brake swithector Parking brake swithector Parking brake swithector S2 ess connector M2 Ground al 1 and switch cas Condition	M24 terminal 1 tch Terminal 1 t4 terminal 12 ar se ground.	2 and parking brake Continuity Yes nd ground. Continuity No INFOID:000000011152960 Continuity

YES >> Inspection End.

NO >> Replace parking brake switch. Refer to <u>PB-7, "Exploded View"</u>.

< DTC/CIRCUIT DIAGNOSIS >

VDC OFF SWITCH

INFOID:0000000011152961

[TYPE 2]

1. CHECK VDC OFF SWITCH OPERATION

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

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-242, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:0000000011152962

Regarding Wiring Diagram information, refer to <u>BRC-178, "Wiring Diagram"</u>.

1.CONNECTOR INSPECTION

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector E125 and VDC OFF switch connector M71.
- 3. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2.

- NO >> Repair or replace as necessary.
- 2. CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to <u>BRC-243, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace VDC OFF switch.

3.CHECK VDC OFF SWITCH SIGNAL

With CONSULT.

- Connect ABS actuator and electric unit (control unit) connector E125 and VDC OFF switch connector M71.
- 2. Turn ignition switch ON.
- 3. In "DATA MONITOR" select "OFF SW" and check VDC OFF switch signal.

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

Is the inspection result normal?

YES >> Refer to <u>BRC-187, "Work Flow"</u>.

NO >> GO TO 4.

4.CHECK VDC OFF SWITCH CIRCUIT

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector E125 and VDC OFF switch connector M71.
- 3. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 30 and VDC OFF switch connector M71 terminal 1.

ABS actuator and ele	ABS actuator and electric unit (control unit)		VDC OFF switch		
Connector	Terminal	Connector Terminal		Continuity	
E125	30	M71	1	Yes	

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

4. Check continuity between ABS actuator and electric unit (control unit) connector terminal E125 terminal 30 and ground.

ABS actuator and ele	ABS actuator and electric unit (control unit)		Continuity	-
Connector	Terminal		Continuity	В
E125	30	Ground	No	-
Is the inspection result norm	al?			С
YES >> GO TO 5.				0

NO >> Repair or replace malfunctioning components.

5.CHECK VDC OFF SWITCH GROUND CIRCUIT

Check continuity between VDC OFF switch connector M71 terminal 2 and ground.

	VDC OFF	⁻ switch		Continuity	
	Connector	Terminal	—	Continuity	
	M71	2	Ground	Yes	BRC
Is the ir	nspection result norma	al?			
YES	>> Replace ABS ac tion".	tuator and electric unit (cont	rol unit). Refer to <u>BRC-2</u>	63, "Removal and Installa-	G
NO	>> Repair or replace	e malfunctioning components			
NO >> Repair or replace malfunctioning components. Component Inspection INFOID:00000011152963					

1.CHECK VDC OFF SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect VDC OFF switch connector.

3. Check continuity between terminals of VDC OFF switch connector.

VDC OFF switch terminals	Condition	Continuity	J
1-2	VDC OFF switch pressed	Yes	
1-2	VDC OFF switch released	No	K

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace VDC OFF switch.

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< DTC/CIRCUIT DIAGNOSIS >

ABS WARNING LAMP

Component Function Check

INFOID:000000011152964

[TYPE 2]

1.CHECK ABS WARNING LAMP FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-244. "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000011152965

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT.
 Perform self-diagnostic result.

Are any DTCs detected?

YES >> Refer to <u>BRC-176, "DTC Index"</u>. NO >> GO TO 2.

2. CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to <u>MWI-9</u>, <u>"METER SYSTEM : System Description"</u>.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263. "Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-85, "Removal and Installation"</u>.

BRAKE WARNING LAMP

BRAKE WARNING LAMP	
< DTC/CIRCUIT DIAGNOSIS > [TYPE 2]	
BRAKE WARNING LAMP	
Component Function Check	ŀ
1. CHECK BRAKE WARNING LAMP FUNCTION (1)	E
Check that brake warning lamp in combination meter turns ON for approximately 2 seconds after ignition switch is turned ON.	
Is the inspection result normal?	(
YES >> GO TO 2.	
NO >> Proceed to diagnosis procedure. Refer to <u>BRC-245, "Diagnosis Procedure"</u> .	[
2.CHECK BRAKE WARNING LAMP FUNCTION (2)	-
Check that brake warning lamp in combination meter turns ON/OFF when parking brake is operated. Is the inspection result normal?	
YES >> Inspection End.	E
NO >> Check parking brake switch system. Refer to <u>BRC-241, "Diagnosis Procedure"</u> .	
Diagnosis Procedure	BI
1.PERFORM THE SELF-DIAGNOSIS	
With CONSULT.	(
Perform self-diagnostic result.	
Are any DTCs detected?	ŀ
YES >> Refer to <u>BRC-176, "DTC Index"</u> . NO >> GO TO 2.	
2. CHECK COMBINATION METER	
Check if indication and operation of combination meter are normal. Refer to MWI-9, "METER SYSTEM : Sys-	
tem Description".	
Is the inspection result normal?	,
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u> , " <u>Removal and Installa-</u> tion".	
NO >> Replace combination meter. Refer to <u>MWI-85. "Removal and Installation"</u> .	ŀ
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HILL DESCENT CONTROL INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

HILL DESCENT CONTROL INDICATOR LAMP

Description

INFOID:000000011657516

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×: ON –: OFF

Condition	Hill descent control indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
Hill descent control function is malfunctioning.	-

Component Function Check

1. CHECK HILL DESCENT CONTROL INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON. <u>Is the inspection result normal?</u>

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-246, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:0000000011657518

INFOID:000000011657517

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-165. "CONSULT Function"</u>. Is the inspection result normal?

- YES >> GO TO 2
- NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-18, "Description"</u>. <u>Is the inspection result normal?</u>

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263. "Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-85, "Removal and Installation"</u>.

Special Repair Requirement

INFOID:000000011657519

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-190, "Description"</u>.

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-192</u>, "<u>Description</u>".

>> END

VDC OFF INDICATOR LAMP

VDC OFF INDICATOR LAMP	
< DTC/CIRCUIT DIAGNOSIS > [TYPE 2]	_
VDC OFF INDICATOR LAMP	A
Component Function Check	
1 .CHECK VDC OFF INDICATOR LAMP FUNCTION (1)	В
Check that VDC OFF indicator lamp in combination meter turns ON for approximately 2 seconds after ignition switch is turned ON.	1
Is the inspection result normal?	С
YES >> GO TO 2.	
NO >> Proceed to diagnosis procedure. Refer to <u>BRC-247, "Diagnosis Procedure"</u> .	D
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.	E
NO >> Check VDC OFF switch. Refer to <u>BRC-242, "Diagnosis Procedure"</u> .	
Diagnosis Procedure	。 BRC
1.PERFORM THE SELF-DIAGNOSIS	
(P)With CONSULT.	G
Perform self diagnostic result.	
Are any DTCs detected?	Н
YES >> Refer to <u>BRC-176, "DTC Index"</u> . NO >> GO TO 2.	
2. CHECK COMBINATION METER	I
Check if indication and operation of combination meter are normal. Refer to <u>MWI-9</u> , <u>"METER SYSTEM : System Description</u> ".	-
Is the inspection result normal?	J
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u> , "Removal and Installa- tion".	:
NO >> Replace combination meter. Refer to <u>MWI-85, "Removal and Installation"</u> .	Κ
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SLIP INDICATOR LAMP

Component Function Check

1. CHECK SLIP INDICATOR LAMP FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-248. "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT. Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to <u>BRC-176, "DTC Index"</u>. NO >> GO TO 2.

2. CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to <u>MWI-9</u>, <u>"METER SYSTEM : System Description"</u>.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u>, "<u>Removal and Installa-</u> tion".
- NO >> Replace combination meter. Refer to <u>MWI-85, "Removal and Installation"</u>.

INFOID:0000000011152970

INFOID:0000000011152971

APPLICATION NOTICE

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS APPLICATION NOTICE

Application Notice

INFOID:000000011645028

[TYPE 2]

Service information	Remarks	C
TYPE 1	VDC/TCS/ABS	C
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS	

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VDC/TCS/ABS

< SYMPTOM DIAGNOSIS >

VDC/TCS/ABS

INFOID:000000011152972

[TYPE 2]

Symptom Table

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

Symptom	Check item	Reference	
Excessive ABS function operation fre-	Brake force distribution	BRC-251, "Diag- nosis Procedure"	
	Looseness of front and rear axle		
4	Wheel sensor and rotor system	<u></u>	
Unexpected pedal reaction	Brake pedal stroke	BRC-252, "Diag-	
	Make sure the braking force is sufficient when the ABS is not operating.	nosis Procedure"	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-253, "Diag- nosis Procedure"	
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-254, "Diag- nosis Procedure"	
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-255, "Diag-	
	ABS actuator and electric unit (control unit)	nosis Procedure"	
Vehicle jerks during VDC/TCS/ABS con- trol	ABS actuator and electric unit (control unit)		
	ТСМ	<u>BRC-256, "Diag-</u> nosis Procedure"	
	ECM	<u></u>	

NOTE:

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

EXCESSIVE OPERATION FREQUENCY

EACESSIVE OPERATION FREQUENCT	
< SYMPTOM DIAGNOSIS > [TYPE 2]	1
EXCESSIVE OPERATION FREQUENCY	
Description	3
VDC function, TCS function, ABS function, EBD function, hill start assist function or hill descent control func tion operates in excessive operation frequency.	-
Diagnosis Procedure	4
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: Refer to <u>FAX-6</u>, "Inspection". 	
Rear axle: Refer to <u>RAX-5. "Inspection"</u> .	
Is the inspection result normal?	
YES >> GO TO 3.	
NO >> Repair or replace malfunctioning components. 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 <u>BRC-258</u>, "Removal and Installation - Front Wheel Sensor". 	
• Rear wheel sensor: Refer to <u>BRC-260</u> , "Removal and Installation - Rear Wheel Sensor".	
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 <u>BRC-262, "Removal and Installation - Front Sensor Rotor"</u>. 	
 Rear sensor rotor: Refer to <u>BRC-262</u>, "Removal and Installation - Rear Sensor Rotor". 	
5.CHECK WARNING LAMP TURNS OFF	_
Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn OFF approx. 1 second afte key switch is turned ON and stay in OFF status during driving. CAUTION:	r
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 >> Inspection End. NO >> Perform self-diagnosis result. Refer to <u>BRC-165, "CONSULT Function"</u>. 	
INO ~ PEHOITH SEIF-UIAGHOSIS LESUIL. REIEL LO <u>DRO-103, CONSULT FUNCTION</u> .	

UNEXPECTED BRAKE PEDAL REACTION

< SYMPTOM DIAGNOSIS >

UNEXPECTED BRAKE PEDAL REACTION

Description

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

Diagnosis Procedure

1.CHECK FRONT AND REAR AXLE

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

• Front axle: Refer to <u>FAX-6, "Inspection"</u>.

Rear axle: Refer to <u>RAX-5, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning components.

2. CHECK DISC ROTOR

Check disc rotor runout.

· Front: Refer to BR-11, "DISC ROTOR : Inspection".

· Rear: Refer to BR-13, "DISC ROTOR : Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Refinish the disc rotor.

3.CHECK BRAKE FLUID LEAKAGE

Check fluid leakage. Refer to <u>BR-8, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning components.

4.CHECK BRAKE PEDAL

Check brake pedal. Refer to <u>BR-7, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust brake pedal. Refer to <u>BR-15, "Adjustment"</u>.

5.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check 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 >> Inspection End.

NO >> Check brake system.

INFOID:0000000011152975

INFOID:000000011152976

THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS > [TYPE 2]	
THE BRAKING DISTANCE IS LONG	А
Description	
Brake stopping distance is long when ABS function is operated.	В
Diagnosis Procedure	
CAUTION: Brake stopping distance on slippery roads like a rough road, gravel road or snowy road may become longer when ABS is operated than when ABS is not operated. 1.CHECK BRAKING FORCE	C
Check brake force using a brake tester. <u>Is the inspection result normal?</u> YES >> GO TO 2. NO >> Check brake system. 2. CHECK BRAKE PERFORMANCE	E
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 >> Inspection End. NO >> Check brake system.	G
NO >> Check blake system.	Н
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ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

ABS FUNCTION DOES NOT OPERATE

Description

VDC function, TCS function, ABS function, EBD function, hill start assist function or hill descent control function does not operate.

Diagnosis Procedure

INFOID:000000011152980

INFOID:000000011152979

CAUTION:

- VDC function, TCS function, ABS function, EBD function, hill start assist function and hill descent control function never operate when the vehicle speed is 10 km/h (6.2 MPH) or less. However, hill start assist function operates when the vehicle speed is 0 km/h (0 MPH) (the vehicle is in stop status).
- VDC function and TCS function never operate when VDC OFF switch is operated (when VDC OFF indicator lamp turns ON).
- Hill descent control function operates when hill descent control switch is operated (when hill descent control system on indicator light 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 >> Inspection End.
- NO >> Perform self-diagnosis result. Refer to <u>BRC-165. "CONSULT Function"</u>.

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

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< SYMPTOM DIAGNOSIS > [TYPE 2]	
BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS	•
Description	1
 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	?
1.SYMPTOM CHECK 1	В
Check that there are pedal vibrations when the engine is started.	
Do vibrations occur? YES >> GO TO 2. NO >> Check brake pedal. Refer to <u>BR-7, "Inspection"</u> .	
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 result. Refer to BRC-165 . "CONSULT Function".	

3.SYMPTOM CHECK 3

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

Does the symptom occur?

- YES >> Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit).
- NO >> Inspection End.

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VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Description

The vehicle jerks when VDC function, TCS function, ABS functionEBD function, hill start assist function or hill descent control function operates.

Diagnosis Procedure

1.CHECK SYMPTOM

Check that the vehicle jerks when VDC function, TCS function, ABS function, EBD function, hill start assist function or hill descent control function operates.

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 2.

2.PERFORM THE SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis result. Refer to <u>BRC-165, "CONSULT Function"</u>.

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-176, "DTC Index"</u>.

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.
- Connect harness connector and perform self-diagnosis result. Refer to <u>BRC-165</u>, "CONSULT Function".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace connector terminal.

4.CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

With CONSULT

Perform self-diagnosis result for "ENGINE" and "TRANSMISSION".

Is any DTC detected?

- YES >> Check the DTC.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-263</u>, "<u>Removal and Installa-</u> tion".

INFOID-000000011152984

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

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INFOID:000000011152985

[TYPE 2]

Symptom	Result
Brake pedal slightly vibrates and operation sound (motor sound and sound from suspen- sion) occurs when VDC function, TCS function, ABS function, EBD function, hill start assist function or hill descent control function operates.	This is not a malfunction, because it is caused by VDC function, TCS function, ABS function, EBD function, hill start as- sist function or hill descent control func- tion 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 corner- ing, when VDC function or TCS function is operated.	
Brake pedal vibrates and motor sound from the engine room occurs when the engine starts or the vehicle starts just after starting the engine.	This is not a malfunction because it is caused by operation check of ABS actuator and electric unit (control unit).
Acceleration may be felt insufficient depending on the road conditions.	This is not a malfunction because it is caused by TCS function that puts the highest priority to obtain the optimum traction (stability).
TCS function may operate momentarily while driving on a road where friction coefficient varies or when downshifting or fully depressing accelerator pedal.	
ABS warning lamp and VDC warning lamp may turn ON when the vehicle is on a rotating urntable 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 nor- mal road. If the normal condition is re- stored, there is no malfunction. In that case, erase "ABS" self-diagnosis result memory with CONSULT.
VDC warning lamp may turn ON and VDC function and TCS function may not normally op- erate, 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 and 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 vehi- cle on a chassis dynamometer, operate VDC OFF switch so that TCS function is OFF.)

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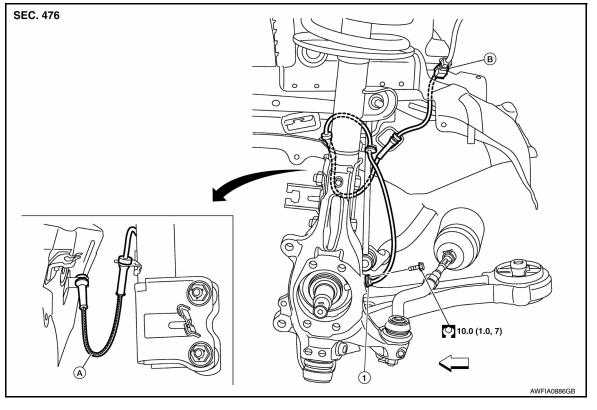
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UNIT REMOVAL AND INSTALLATION WHEEL SENSOR

Exploded View - Front Wheel Sensor

INFOID:0000000011152986

[TYPE 2]



- 1. Front wheel sensor
- A. Color line (slant line)
- B. Front wheel sensor connector

← Front

Removal and Installation - Front Wheel Sensor

CAUTION:

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

REMOVAL

- 1. Remove the front wheel and tire using power tool. Refer to WT-58, "Adjustment".
- 2. Partially remove the fender protector to gain access to the wheel sensor harness connector.
- 3. Disconnect the front wheel sensor harness connector.
- 4. Remove the front wheel sensor bolt.
- 5. Remove the front wheel sensor from the strut bracket and body brackets.
- 6. Remove the front wheel sensor from the steering knuckle.

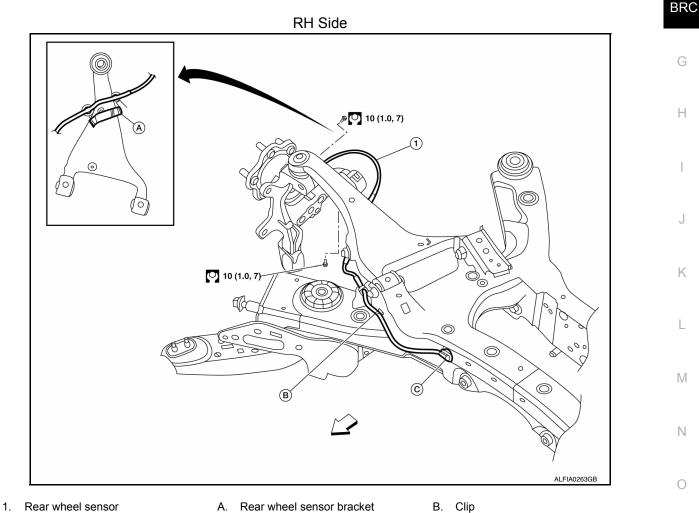
INSTALLATION

Revision: September 2014

Installation is in the reverse order of removal. CAUTION:

- When installing, make sure there is no foreign material such as iron chips on and in the hole in the steering knuckle for the front wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- Do not twist front wheel sensor harness when installing front wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that front wheel sensor harness is not twisted after installation.





- C. Rear wheel sensor connector
- A. Rear wheel sensor bracket <>> Front



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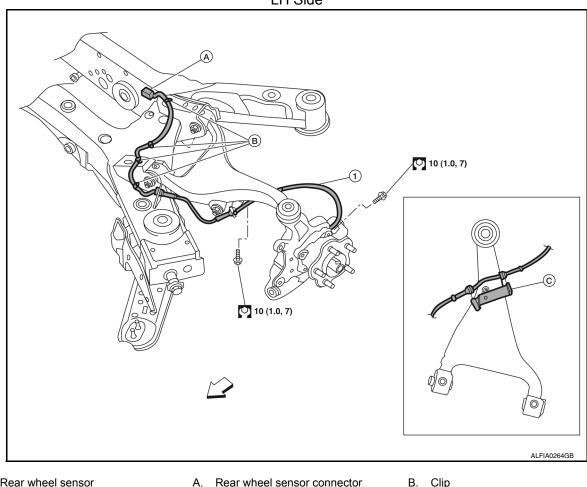
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[TYPE 2]

WHEEL SENSOR

< UNIT REMOVAL AND INSTALLATION >

LH Side



1. Rear wheel sensor

C. Rear wheel sensor bracket

∠ Front

Removal and Installation - Rear Wheel Sensor

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CAUTION:

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

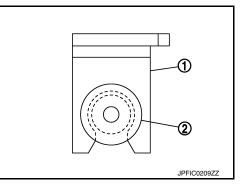
REMOVAL

- Remove the rear wheel and tire using power tool. Refer to <u>WT-58, "Adjustment"</u>.
- 2. Remove the rear wheel sensor bolt.
- Disconnect the rear wheel sensor harness connector. 3.
- 4. Remove the rear wheel sensor from the sensor brackets.
- 5. Remove the rear wheel sensor from the rear knuckle.

INSTALLATION

Installation is in the reverse order of removal. CAUTION:

- When installing, make sure there is no foreign material such as iron chips on and in the hole in the rear knuckle for the rear wheel sensor. Make sure no foreign material has been caught in the sensor A rotor. Remove any foreign material and clean the mount.
- Do not twist rear wheel sensor harness when installing rear wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that rear wheel sensor harness is not twisted after installation.



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SENSOR ROTOR

Removal and Installation - Front Sensor Rotor

The front wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to <u>FAX-8</u>, "<u>Removal and Installation</u>".

Removal and Installation - Rear Sensor Rotor

The rear wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to <u>RAX-7</u>, "<u>Removal and Installation</u>".

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< UNIT REMOVAL AND INSTALLATION >

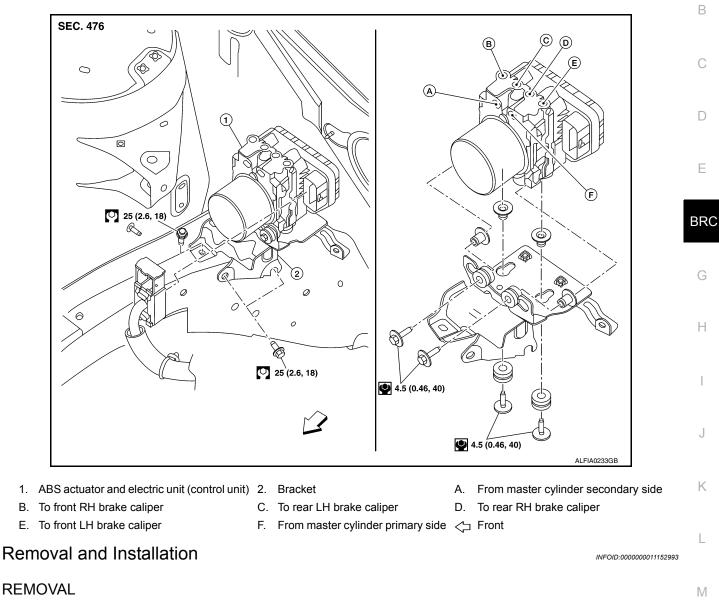
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

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[TYPE 2]

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REMOVAL

CAUTION:

• To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged.

Do not remove actuator by holding harness.

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

- Disconnect negative battery terminal. Refer to <u>PG-95</u>, "Exploded View".
- Remove cowl top. Refer to <u>EXT-25, "Removal and Installation"</u>.
- Disconnect the harness connector from the ABS actuator and electric unit (control unit).
- 4. Separate brake tubes from ABS actuator and electric unit (control unit). Refer to BR-22, "FRONT : Exploded View".
- 5. Remove ABS actuator and electric unit (control unit) bracket bolts.
- 6. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

Installation is in the reverse order of removal.

- After work is completed, bleed air from brake tube. Refer to BR-16, "Bleeding Brake System".
- Adjust the neutral position of steering angle sensor. Refer to <u>BRC-190. "Work Procedure"</u>.
- Perform calibration of the yaw rate/side/decel G sensor: Refer to BRC-192, "Work Procedure".

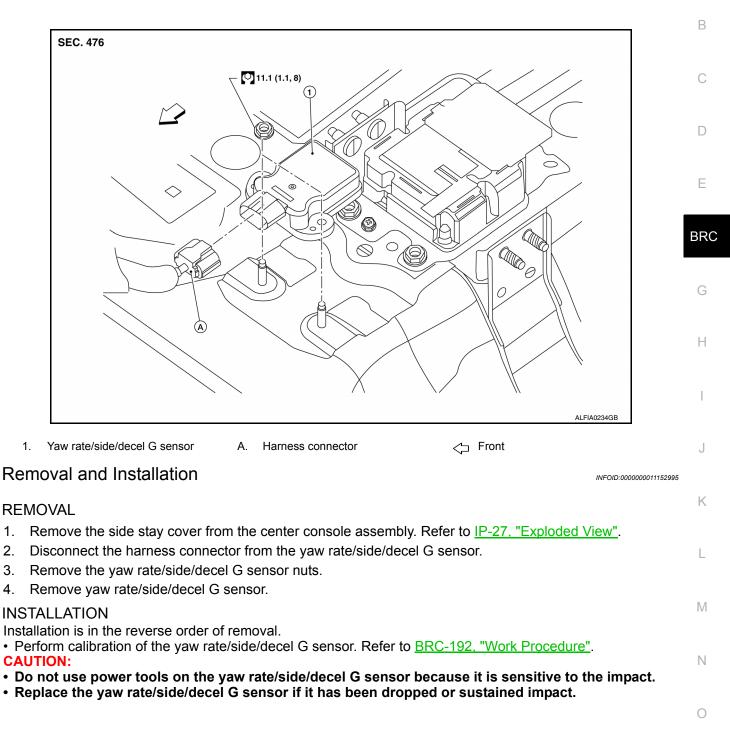
CAUTION:

- To install, use flare nut crowfoot and torque wrench.
- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Do not install actuator by holding harness.
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked.

YAW RATE/SIDE/DECEL G SENSOR

Exploded View

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STEERING ANGLE SENSOR

Removal and Installation

To remove and install the steering angle sensor, remove and install spiral cable. Refer to <u>SR-15. "Removal</u> and Installation".

HILL DESCENT CONTROL SWITCH

< UNIT REMOVAL AND INSTALLATION >

HILL DESCENT CONTROL SWITCH

Removal and Installation

The hill descent control switch is integral part of the 4WD shift switch, to remove and install the hill descent control switch. Refer to <u>DLN-73</u>, "<u>Removal and Installation</u>".

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[TYPE 2]