

BRC

SECTION

BRAKE CONTROL SYSTEM

CONTENTS

ABS	ECU DIAGNOSIS INFORMATION	22
PRECAUTION	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	22
PRECAUTIONS	Reference Value	22
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	Fail-safe	24
Precaution for Brake System	DTC Inspection Priority Chart	25
Precaution for Brake Control System	DTC Index	26
Precaution for Harness Repair	WIRING DIAGRAM	27
PREPARATION	BRAKE CONTROL SYSTEM	27
PREPARATION	Wiring Diagram	27
Special Service Tool	BASIC INSPECTION	34
Commercial Service Tool	DIAGNOSIS AND REPAIR WORK FLOW	34
SYSTEM DESCRIPTION	Work Flow	34
COMPONENT PARTS	Diagnostic Work Sheet	35
Component Parts Location	DTC/CIRCUIT DIAGNOSIS	36
Component Description	C1101, C1102, C1103, C1104 WHEEL SENSOR	36
ABS Actuator and Electric Unit (Control Unit)	DTC Logic	36
Wheel Sensor and Sensor Rotor	Diagnosis Procedure	36
Stop Lamp Switch	C1105, C1106, C1107, C1108 WHEEL SENSOR	40
Brake Fluid Level Switch	DTC Logic	40
Parking Brake Switch	Diagnosis Procedure	40
SYSTEM	C1109 POWER AND GROUND SYSTEM	42
ABS	DTC Logic	42
ABS : System Diagram	Diagnosis Procedure	42
ABS : System Description	C1110 CONTROL FAILURE	44
ABS : ABS Function	DTC Logic	44
ABS : EBD Function	Diagnosis Procedure	44
ABS : Fail-safe	C1111 PUMP MOTOR	45
DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]	DTC Logic	45
CONSULT Function (ABS)		

Diagnosis Procedure	45	EXCESSIVE ABS FUNCTION OPERATION	
C1115 ABS SENSOR [ABNORMAL SIGNAL]..	47	FREQUENCY	63
DTC Logic	47	Diagnosis Procedure	63
Diagnosis Procedure	47	UNEXPECTED PEDAL REACTION	64
C1120, C1122, C1124, C1126 ABS IN VALVE		Diagnosis Procedure	64
SYSTEM	49	THE BRAKING DISTANCE IS LONG	65
DTC Logic	49	Diagnosis Procedure	65
Diagnosis Procedure	49	ABS FUNCTION DOES NOT OPERATE	66
C1121, C1123, C1125, C1127 ABS OUT		Diagnosis Procedure	66
VALVE SYSTEM	51	PEDAL VIBRATION OR ABS OPERATION	
DTC Logic	51	SOUND OCCURS	67
Diagnosis Procedure	51	Diagnosis Procedure	67
C1130 ENGINE SIGNAL	53	NORMAL OPERATING CONDITION	68
DTC Logic	53	Description	68
Diagnosis Procedure	53	REMOVAL AND INSTALLATION	69
C1140 ACTUATOR RELAY SYSTEM	54	WHEEL SENSOR	69
DTC Logic	54	FRONT WHEEL SENSOR	69
Diagnosis Procedure	54	FRONT WHEEL SENSOR : Exploded View	69
U1000 CAN COMM CIRCUIT	56	FRONT WHEEL SENSOR : Removal and Instal-	
DTC Logic	56	lation	69
Diagnosis Procedure	56	REAR WHEEL SENSOR	70
U1010 CONTROL UNIT (CAN)	57	REAR WHEEL SENSOR : Exploded View	70
Description	57	REAR WHEEL SENSOR : Removal and Installa-	
DTC Logic	57	tion	70
Diagnosis Procedure	57	SENSOR ROTOR	72
PARKING BRAKE SWITCH	58	FRONT SENSOR ROTOR	72
Component Function Check	58	FRONT SENSOR ROTOR : Removal and Instal-	
Diagnosis Procedure	58	lation	72
Component Inspection	59	REAR SENSOR ROTOR	72
ABS WARNING LAMP	60	REAR SENSOR ROTOR : Removal and Installa-	
Component Function Check	60	tion	72
Diagnosis Procedure	60	ABS ACTUATOR AND ELECTRIC UNIT	
BRAKE WARNING LAMP	61	(CONTROL UNIT)	73
Component Function Check	61	Exploded View	73
Diagnosis Procedure	61	Removal and Installation	73
SYMPTOM DIAGNOSIS	62		
ABS	62		
Symptom Table	62		

PRECAUTION

PRECAUTIONS

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

INFOID:000000009619483

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.

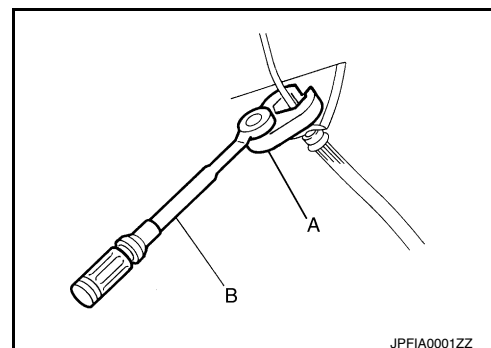
Precaution for Brake System

INFOID:000000009619484

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-12, "Fluids and Lubricants"](#).
- Do not reuse drained brake fluid.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Do not use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with a crow-foot (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.



PRECAUTIONS

< PRECAUTION >

[ABS]

Precaution for Brake Control System

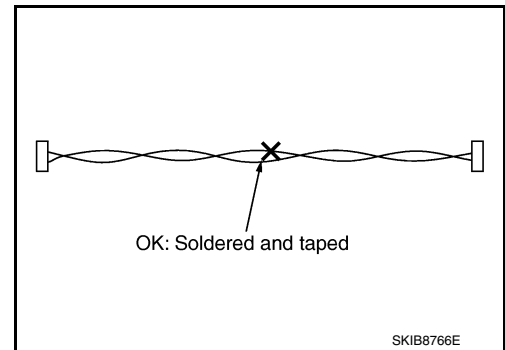
INFOID:000000009619485

- 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.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspension-related 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.

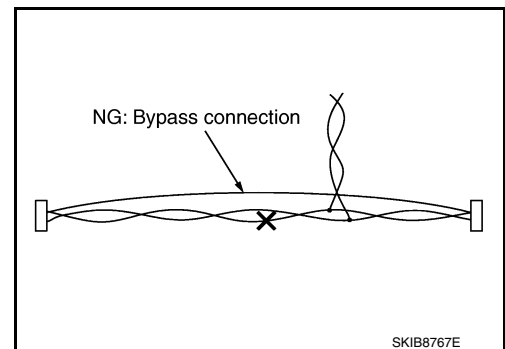
Precaution for Harness Repair

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



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



PREPARATION

< PREPARATION >

[ABS]

PREPARATION

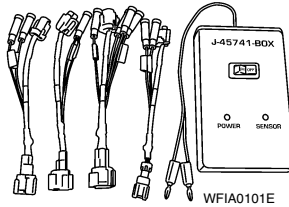
PREPARATION

Special Service Tool

INFOID:000000009619487

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

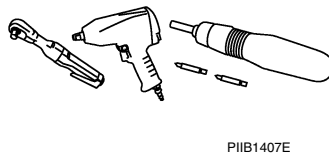
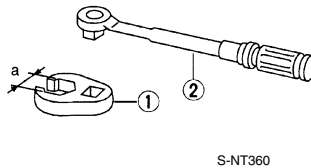
Tool number (Kent-Moore No.) Tool name	Description
KV991J0080 (J-45741) ABS active wheel sensor tester	Checking operation of ABS active wheel sensors



Commercial Service Tool

INFOID:000000009619488

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

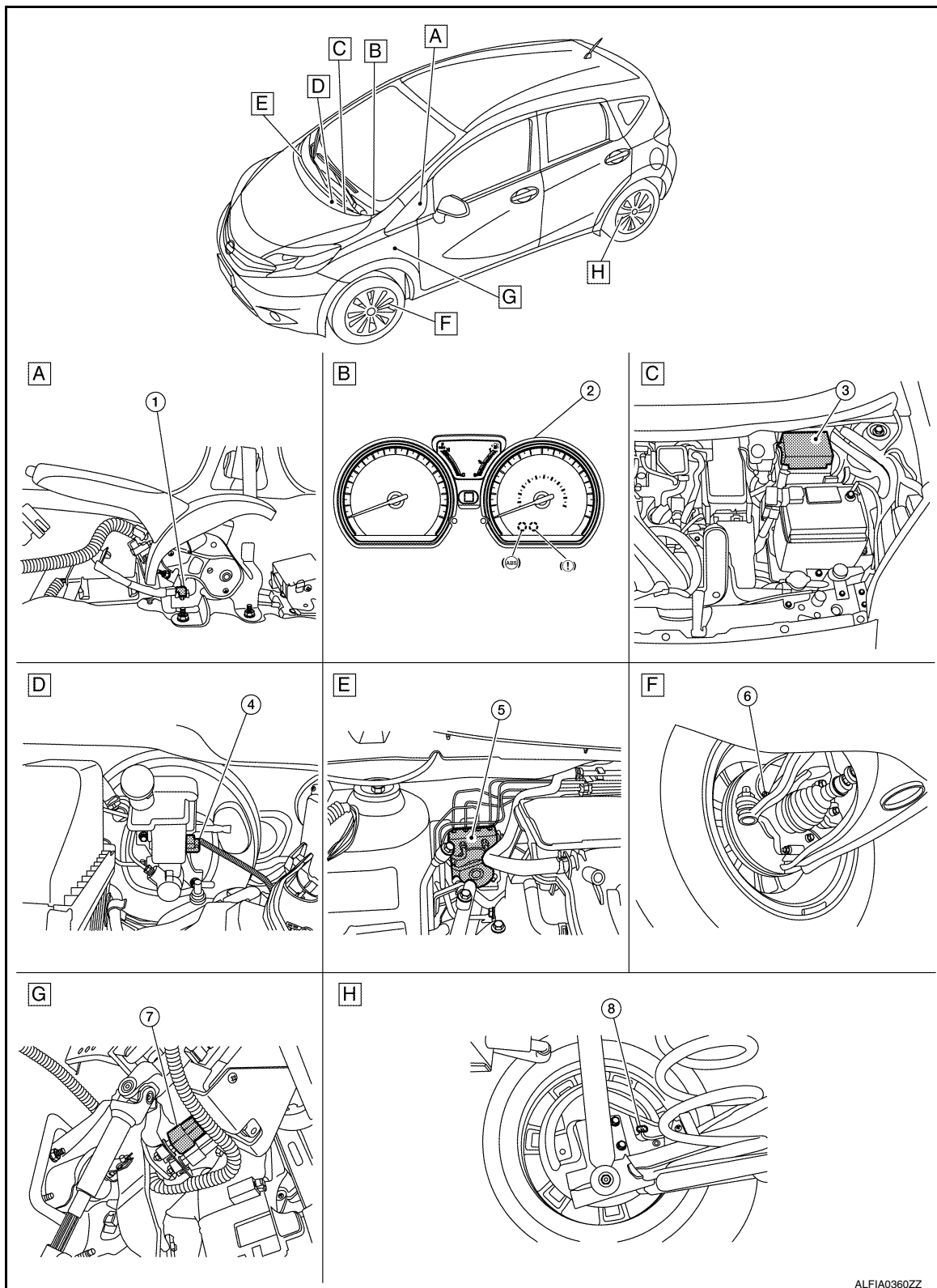


SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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COMPONENT PARTS

[ABS]

< SYSTEM DESCRIPTION >

A	Parking brake switch (view with console removed)	B	Combination meter	C	IPDM E/R
D	Brake fluid level switch (view with IPDM E/R removed)	E	ABS actuator and electric unit (con- trol unit)	F	Front wheel sensor
G	Stop lamp switch	H	Rear wheel sensor		

Component Description

INFOID:000000009365050

No.	Component	Reference/Function
1	Parking brake switch	BRC-8, "Parking Brake Switch"
2	Combination meter	MWI-6, "METER SYSTEM : Combination Meter"
3	IPDM E/R	PCS-4, "Component Parts Location"
4	Brake fluid level switch	BRC-8, "Brake Fluid Level Switch"
5	ABS actuator and electric unit (con- trol unit)	BRC-7, "ABS Actuator and Electric Unit (Control Unit)"
6	Front wheel speed sensor	BRC-7, "Wheel Sensor and Sensor Rotor"
7	Stop lamp switch	BRC-8, "Stop Lamp Switch"
8	Rear wheel speed sensor	BRC-7, "Wheel Sensor and Sensor Rotor"

ABS Actuator and Electric Unit (Control Unit)

INFOID:000000009365051

Electric unit (control unit) is integrated with actuator and comprehensively controls ABS function and EBD function.

ELECTRIC UNIT (CONTROL UNIT)

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

ACTUATOR

The following components are integrated with ABS actuator.

Pump

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

Motor

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

Motor Relay

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

Actuator Relay (Main Relay)

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

ABS IN Valve

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

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 and wheel cylinder to master cylinder by bypassing orifice of each valve when brake is released.

Reservoir

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

Wheel Sensor and Sensor Rotor

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NOTE:

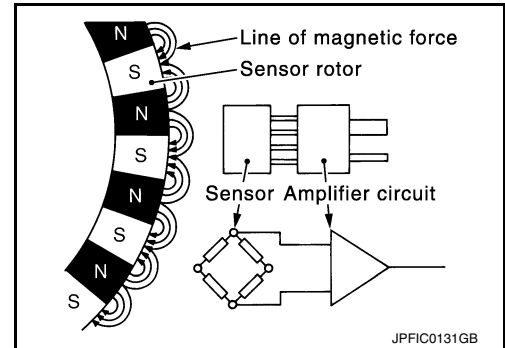
- Wheel sensor of front wheel is installed on steering knuckle.

COMPONENT PARTS

[ABS]

< SYSTEM DESCRIPTION >

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



Stop Lamp Switch

INFOID:000000009365053

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

Brake Fluid Level Switch

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

Parking Brake Switch

INFOID:000000009365057

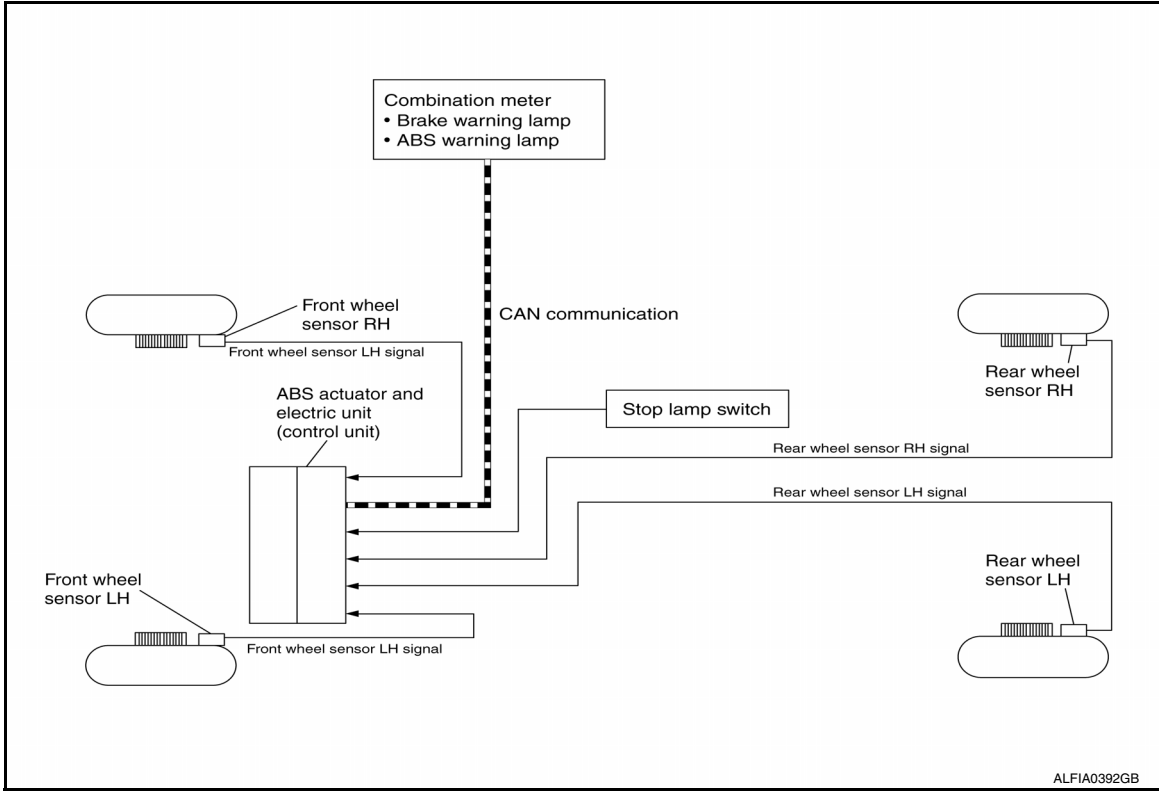
Detects the operation status of parking brake switch and transmits converted electric signal from combination meter to ABS actuator and electric unit (control unit) via CAN communication.

SYSTEM

ABS

ABS : System Diagram

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ABS : System Description

INFOID:000000009365059

- The system switches fluid pressure of each brake caliper and each wheel cylinder 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 ABS and EBD functions.
- 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
Combination meter	Transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Brake fluid level switch signal • Parking brake switch signal Receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • ABS warning lamp signal • Brake warning lamp signal

VALVE OPERATION (ABS AND EBD FUNCTIONS)

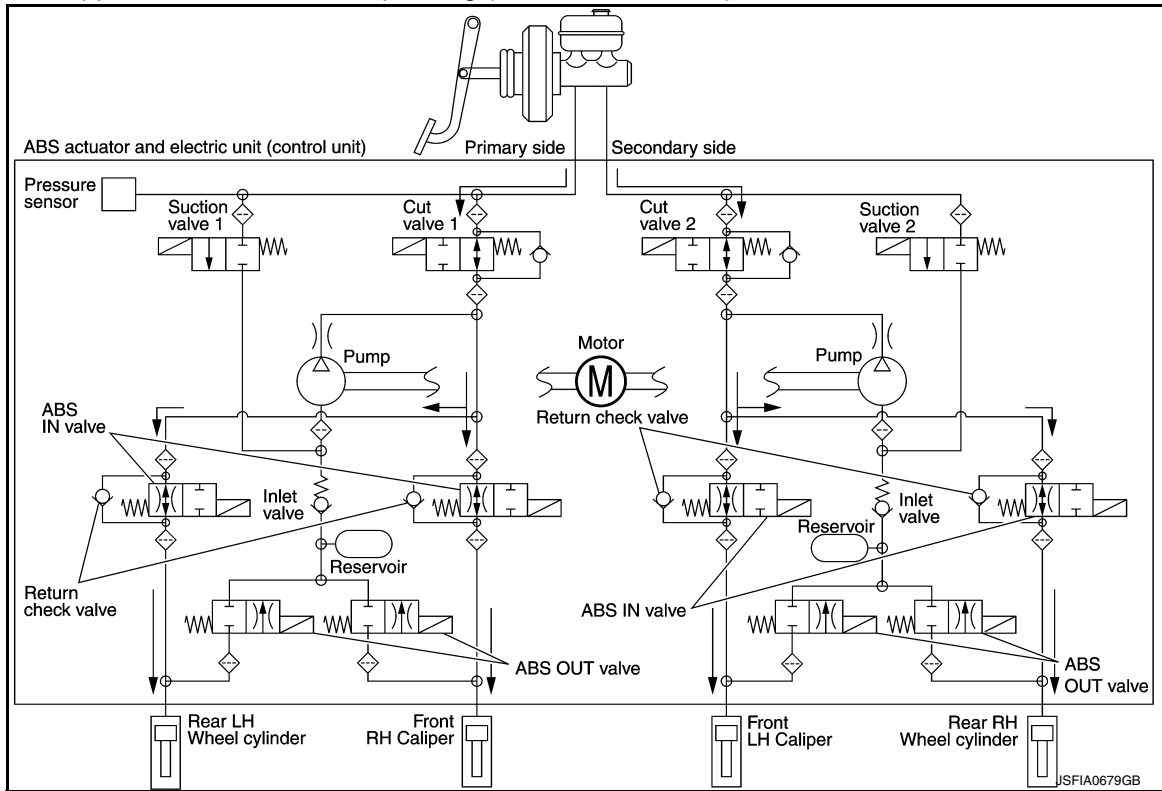
The control unit built into the ABS actuator and electric unit (control unit) controls fluid pressure of the brake calipers by operating each valve.

SYSTEM

[ABS]

< SYSTEM DESCRIPTION >

Brake Pedal Applied or ABS Function Operating (Pressure Increases)



Name	Not activated	During 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)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is not supplied (open)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper and each wheel cylinder (fluid pressure)	—	Pressure increases

Front RH brake caliper

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

Front LH brake caliper

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

Rear RH wheel cylinder

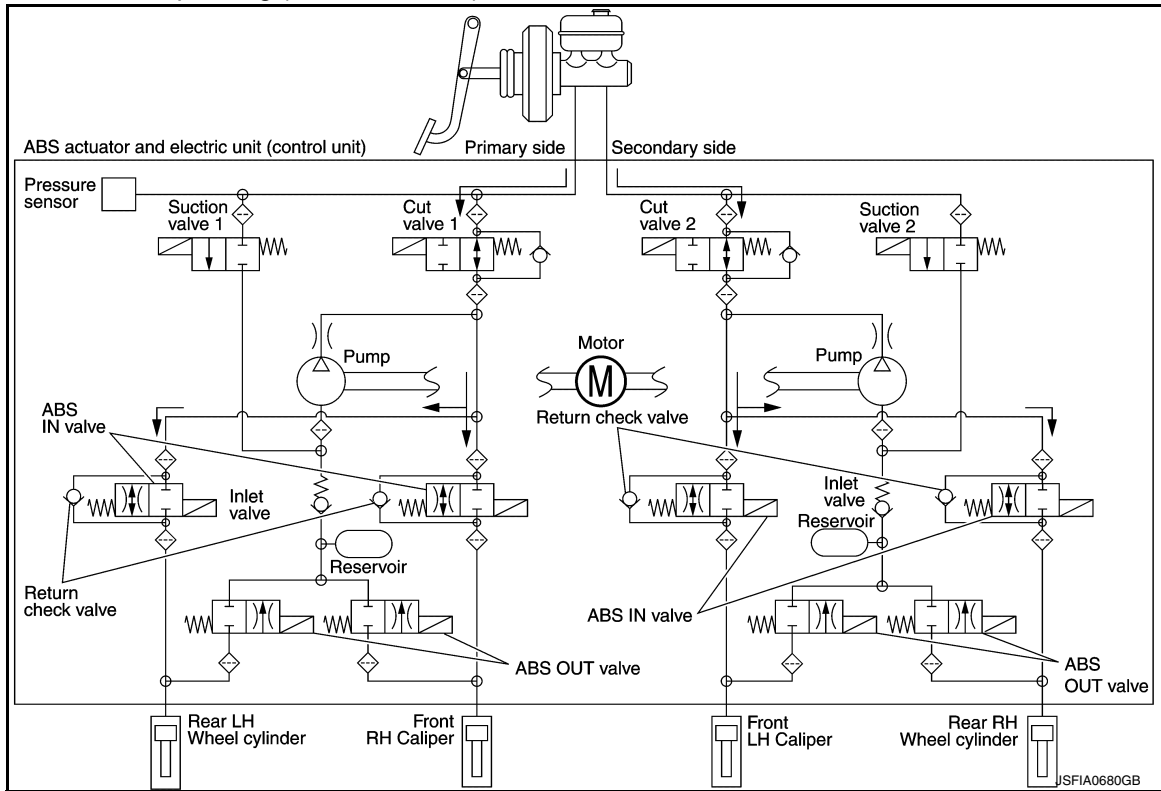
- When the cut valve 2 and the ABS IN valve opens, brake fluid is supplied to the rear RH wheel cylinder from the master cylinder through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

Rear LH wheel cylinder

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

< SYSTEM DESCRIPTION >

ABS Function Starts Operating (Pressure Holds)



Name	Not activated	During pressure holds
Cut valve 1	Power supply is not supplied (open)	Power supply is not supplied (open)
Cut valve 2	Power supply is not supplied (open)	Power supply is not supplied (open)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is supplied (close)
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)
Each brake caliper and each wheel cylinder (fluid pressure)	—	Pressure holds

Front RH brake caliper

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

Front LH brake caliper

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

Rear RH wheel cylinder

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

Rear LH wheel cylinder

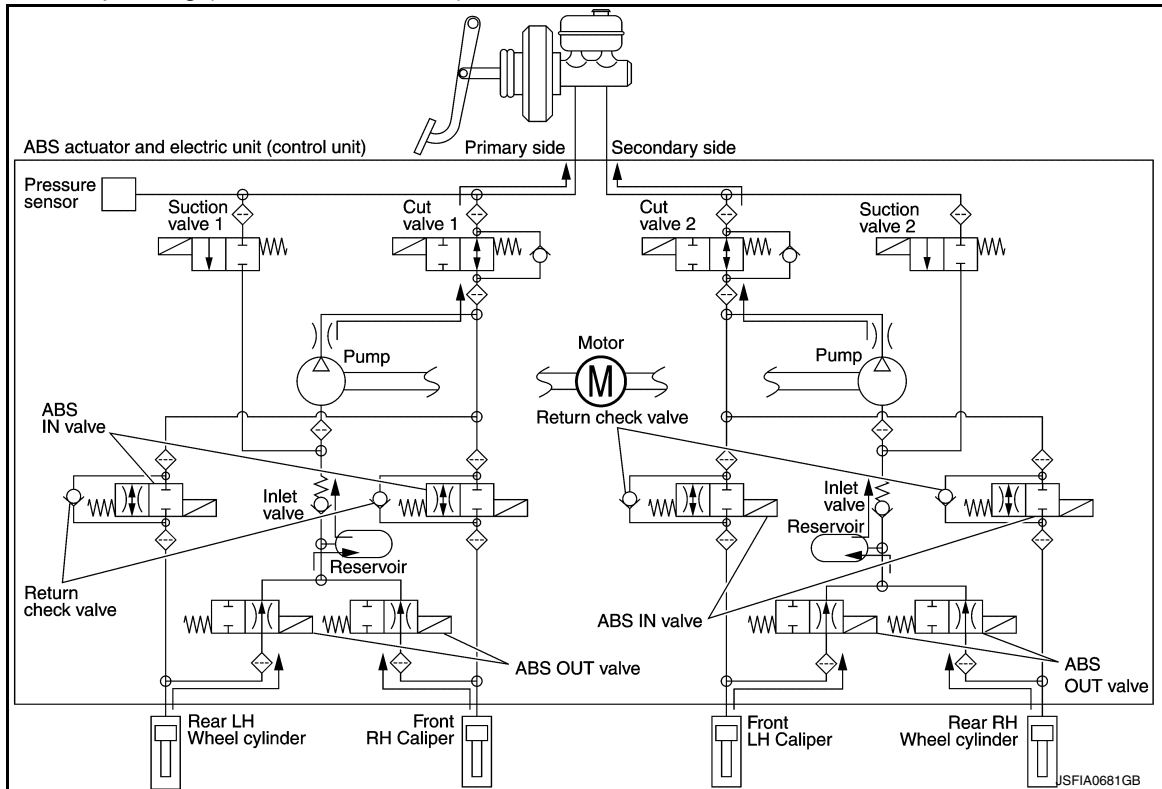
- Since the ABS IN valve and the ABS OUT valve are closed, the rear LH wheel cylinder, master cylinder, and reservoir are blocked. This maintains fluid pressure applied on the rear LH wheel cylinder.

SYSTEM

[ABS]

< SYSTEM DESCRIPTION >

ABS Function Operating (Pressure Decreases)



Name	Not activated	During 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)
Suction valve 1	Power supply is not supplied (close)	Power supply is not supplied (close)
Suction valve 2	Power supply is not supplied (close)	Power supply is not supplied (close)
ABS IN valve	Power supply is not supplied (open)	Power supply is supplied (close)
ABS OUT valve	Power supply is not supplied (close)	Power supply is supplied (open)
Each brake caliper and each wheel cylinder (fluid pressure)	—	Pressure decreases

Front RH brake caliper

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

Front LH brake caliper

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

Rear RH wheel cylinder

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

Rear LH wheel cylinder

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

Component Parts and Function

SYSTEM

< SYSTEM DESCRIPTION >

[ABS]

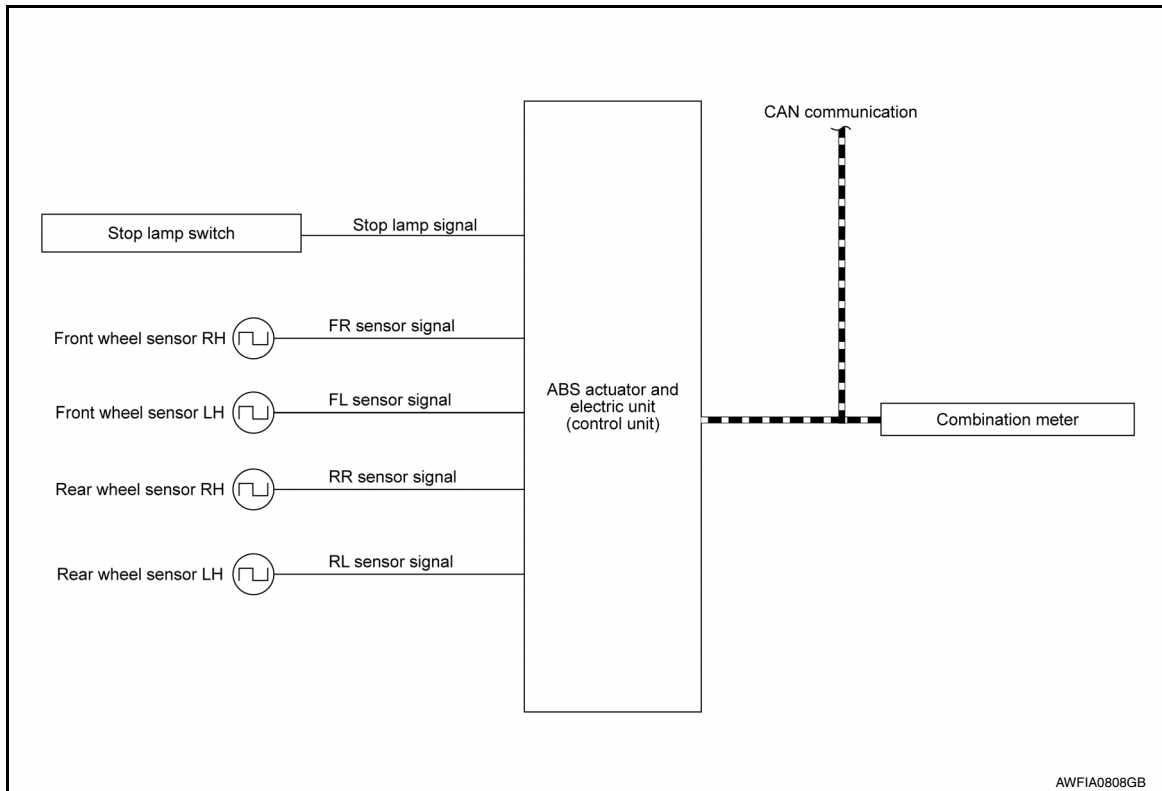
Component	Function
Pump	Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.
Motor	Activates the pump according to signals from ABS actuator and electric unit (control unit).
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from 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 and wheel cylinder to master cylinder by bypassing orifice of each valve when brake is released.
Reservoir	Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper and wheel cylinder.

CONDITIONS FOR WARNING LAMP ILLUMINATION

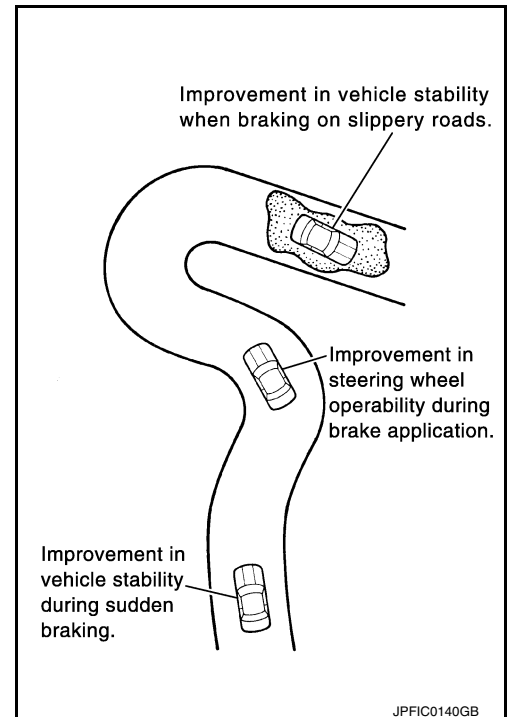
Turns ON when ignition switch turns ON and turns OFF when the system is normal, for bulb check purposes.

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

SYSTEM DIAGRAM



- By preventing wheel lock through brake force (brake fluid pressure) control that is electronically controlled by detecting wheel speed during braking, stability during emergency braking is improved so that obstacles can be easily bypassed by steering operation.
- During braking, control units calculate wheel speed and pseudo-vehicle speed, and transmit 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 while cornering.
 - Obstacles may be easily bypassed by steering operation during braking.
- CONSULT can be used to diagnose the system.
- Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for ABS function. However, EBD function operates normally. Refer to [BRC-16. "ABS : Fail-safe"](#).



INPUT SIGNAL AND OUTPUT SIGNAL

SYSTEM

< SYSTEM DESCRIPTION >

[ABS]

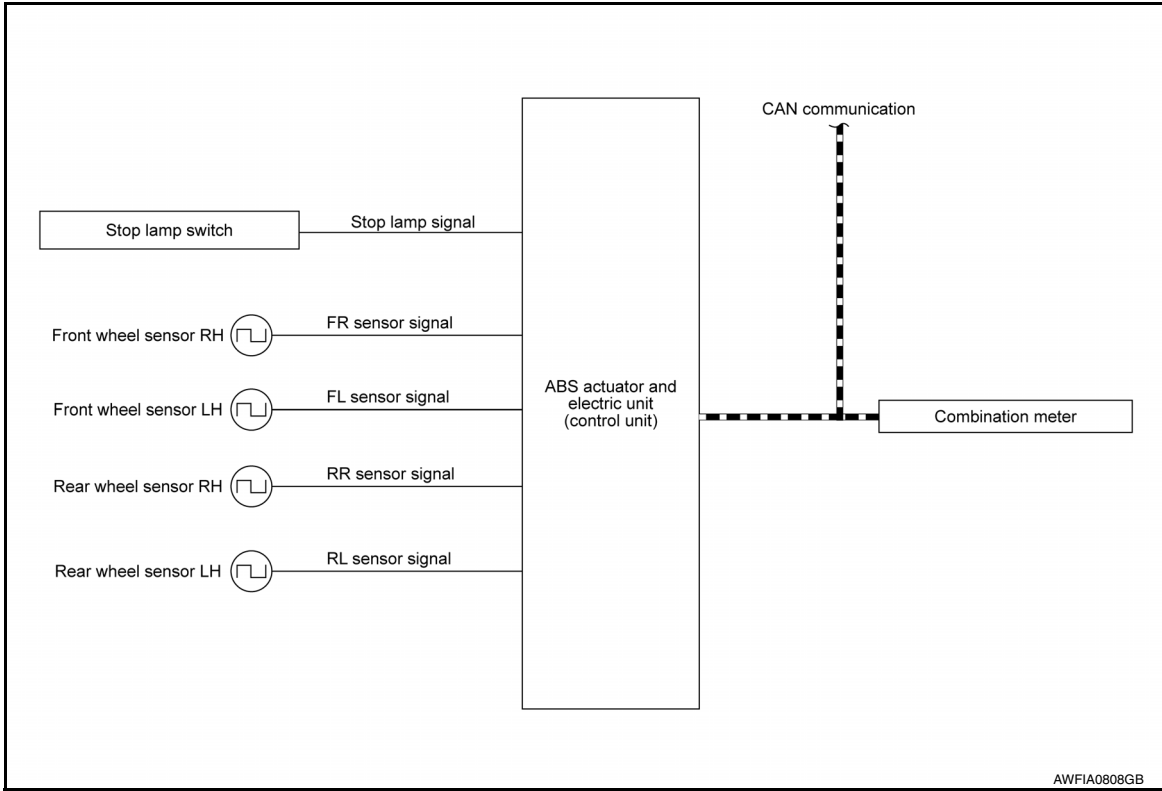
Major signal transmission between each unit via communication lines is shown in the following table.

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

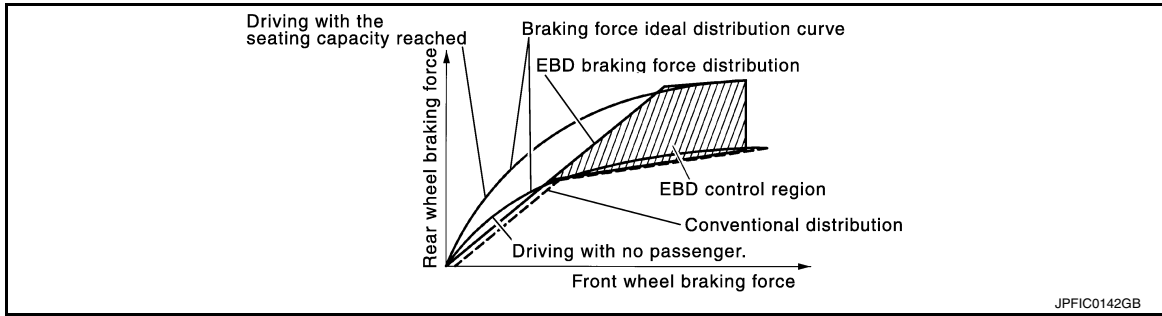
ABS : EBD Function

INFOID:0000000009667732

SYSTEM DIAGRAM



- 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).

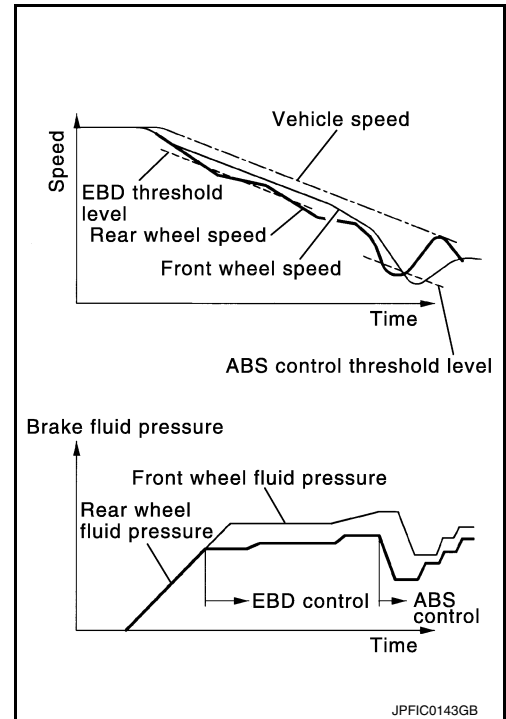


SYSTEM

[ABS]

< 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 ABS function and EBD function. Refer to [BRC-24, "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
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. • Brake warning lamp signal

ABS : Fail-safe

INFOID:000000009365064

ABS FUNCTION

ABS 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 ABS functions. However, EBD functions operate normally.

EBD FUNCTION

ABS warning lamp and brake 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 ABS and EBD functions.

SYSTEM

< SYSTEM DESCRIPTION >

[ABS]

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: • ABS • EBD (only when both rear wheels are malfunctioning)
C1102	When an open circuit is detected in rear LH wheel sensor circuit.	
C1103	When an open circuit is detected in front RH wheel sensor circuit.	
C1104	When an open circuit is detected in front LH wheel sensor circuit.	
C1105	- When a short circuit is detected in rear RH wheel sensor circuit. - When power supply voltage of rear RH wheel sensor is in following state. - Rear RH wheel sensor power supply voltage: $7.2\text{ V} \geq$ Rear RH wheel sensor power supply voltage - When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. - When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal.	
C1106	- When a short circuit is detected in rear LH wheel sensor circuit. - When power supply voltage of rear LH wheel sensor is in following state. - Rear LH wheel sensor power supply voltage: $7.2\text{ V} \geq$ Rear LH wheel sensor power supply voltage - When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. - When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal.	
C1107	- When a short circuit is detected in front RH wheel sensor circuit. - When power supply voltage of front RH wheel sensor is in following state. - Front RH wheel sensor power supply voltage: $7.2\text{ V} \geq$ Front RH wheel sensor power supply voltage - When distance between front RH wheel sensor and front RH wheel sensor rotor is large. - When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal.	
C1108	- When a short circuit is detected in front LH wheel sensor circuit. - When power supply voltage of front LH wheel sensor is in following state. - Front LH wheel sensor power supply voltage: $7.2\text{ V} \geq$ Front LH wheel sensor power supply voltage - When distance between front LH wheel sensor and front LH wheel sensor rotor is large. - When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal.	
C1109	- When ignition power supply voltage is in following state. - Ignition power supply voltage: $10\text{ V} \geq$ Ignition power supply voltage. - Ignition power supply voltage: $16\text{ V} \leq$ Ignition power supply voltage.	
C1110	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	
C1111	When a malfunction is detected in motor or motor relay.	The following functions are suspended: • ABS
C1115	When difference in wheel speed between any wheel and others is detected when the vehicle is driven, because of installation of tires other than specified.	The following functions are suspended: • ABS • EBD

A
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P

SYSTEM

< SYSTEM DESCRIPTION >

[ABS]

DTC	Malfunction detected condition	Fail-safe condition
C1120	When a malfunction is detected in front LH ABS IN valve.	The following functions are suspended: • ABS • EBD
C1121	When a malfunction is detected in front LH ABS OUT valve.	
C1122	When a malfunction is detected in front RH ABS IN valve.	
C1123	When a malfunction is detected in front RH ABS OUT valve.	
C1124	When a malfunction is detected in rear LH ABS IN valve.	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	
C1126	When a malfunction is detected in rear RH ABS IN valve.	
C1127	When a malfunction is detected in rear RH ABS OUT valve.	
C1130	When a CAN signal malfunction is detected.	
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended: • ABS • EBD
U1000	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.	
U1010	When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit).	

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

< SYSTEM DESCRIPTION >

[ABS]

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

CONSULT Function (ABS)

INFOID:000000009365065

APPLICATION ITEMS

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

Direct Diagnostic Mode	Description
ECU identification	The ABS actuator and electric unit (control unit) part number is displayed.
Self Diagnostic Result	The ABS actuator and electric unit (control unit) self diagnostic results are displayed.
Data Monitor	The ABS actuator and electric unit (control unit) input/output data is displayed in real time.
Active Test	The ABS actuator and electric unit (control unit) activates outputs to test components.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication is displayed.

ECU IDENTIFICATION

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

SELF DIAGNOSTIC RESULT

Operation Procedure

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

How To Erase Self Diagnostic Result

1. After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp and brake warning lamp turn OFF.

CAUTION:

If memory cannot be erased, perform applicable diagnosis.

NOTE:

- When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp and brake warning lamp will not turn OFF even when the system is normal, unless the vehicle is driven at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
- Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).

Display Item List

Refer to [BRC-26. "DTC Index"](#).

DATA MONITOR

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

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

< SYSTEM DESCRIPTION >

[ABS]

Item (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR RH OUT SOL (On/Off)	—	×	×	Front RH OUT ABS solenoid (On/Off) status is displayed.
FR LH IN SOL (On/Off)	—	×	×	Front LH IN ABS solenoid (On/Off) status is displayed.
FR LH OUT SOL (On/Off)	—	×	×	Front LH OUT ABS solenoid (On/Off) status is displayed.
RR RH IN SOL (On/Off)	—	×	×	Rear RH IN ABS solenoid (On/Off) status is displayed.
RR RH OUT SOL (On/Off)	—	×	×	Rear RH OUT ABS solenoid (On/Off) status is displayed.
RR LH IN SOL (On/Off)	—	×	×	Rear LH IN ABS solenoid (On/Off) status is displayed.
RR LH OUT SOL (On/Off)	—	×	×	Rear LH OUT ABS solenoid (On/Off) status is displayed.
EBD WARN LAMP (On/Off)	—	—	×	Brake warning lamp (On/Off) status is displayed.
STOP LAMP SW (On/Off)	×	×	×	Stop lamp switch (On/Off) status is displayed.
MOTOR RELAY (On/Off)	—	×	×	ABS motor relay signal (On/Off) status is displayed.
ACTUATOR RLY (On/Off)	—	×	×	ABS actuator relay signal (On/Off) status is displayed.
ABS WARN LAMP (On/Off)	—	×	×	ABS warning lamp (On/Off) status is displayed.
BATTERY VOLT (V)	×	×	×	Voltage (V) supplied to ABS actuator and electric unit (control unit) is displayed.
ENGINE SPEED	×	×	×	Engine speed status is displayed.
EBD SIGNAL (On/Off)	—	—	×	EBD operation (On/Off) status is displayed.
ABS SIGNAL (On/Off)	—	—	×	ABS operation (On/Off) status is displayed.
EBD FAIL SIG (On/Off)	—	—	×	EBD fail signal (On/Off) status is displayed.
ABS FAIL SIG (On/Off)	—	—	×	ABS fail signal (On/Off) status is displayed.
CRANKING SIG (On/Off)	—	—	×	The input state of the key SW START position signal is displayed.

×: Applicable

—: Not applicable

ACTIVE TEST MODE

CAUTION:

- Do not perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.
- The active test cannot be performed with the ABS warning lamp or brake warning lamp on.
- ABS warning lamp and brake warning lamp turn on during active test.

NOTE:

- When active test is performed while depressing the pedal, the pedal depression amount will change. This is normal.
- "TEST IS STOPPED" is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" is displayed, to perform test again, touch BACK.

Test Item

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

< SYSTEM DESCRIPTION >

[ABS]

ABS SOLENOID VALVE

- Select “Up”, “Keep” and “Down”. Then use screen monitor to check that solenoid valve operates as shown in the table below.

Test item	Display item	Display (Note)		
		Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
	FR RH OUT SOL	Off	Off	On*
FR LH SOL	FR LH IN SOL	Off	On	On
	FR LH OUT SOL	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
	RR RH OUT SOL	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
	RR LH OUT SOL	Off	Off	On*

*: On for 1 to 2 seconds after the select, and then Off.

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

ABS MOTOR

- Select “On” and “Off”. Make sure motor relay and actuator relay operates as shown in table below.

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

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[ABS]

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000009365066

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short-circuited.

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FR LH SENSOR	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display ($\pm 10\%$ or less)	Vehicle running (Note 1)
FR RH SENSOR	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display ($\pm 10\%$ or less)	Vehicle running (Note 1)
RR LH SENSOR	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display ($\pm 10\%$ or less)	Vehicle running (Note 1)
RR RH SENSOR	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display ($\pm 10\%$ or less)	Vehicle running (Note 1)
FR RH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR RH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR RH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[ABS]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
RR RH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR LH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR LH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
EBD WARN LAMP	EBD warning lamp (Note 2)	When EBD warning lamp is ON	On
		When EBD warning lamp is OFF	Off
STOP LAMP SW	Brake pedal operation	When brake pedal is depressed	On
		When brake pedal is not depressed	Off
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	On
		When the motor relay and motor are not operating	Off
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	On
		When the actuator relay is not operating	Off
ABS WARN LAMP	ABS warning lamp (Note 2)	When ABS warning lamp is ON	On
		When ABS warning lamp is OFF	Off
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
ENGINE SPEED	Engine speed status	Engine stopped	0 RPM
		Engine running	Almost same reading as tachometer
EBD SIGNAL	EBD operation	EBD is active	On
		EBD is inactive	Off
ABS SIGNAL	ABS operation	ABS is active	On
		ABS is inactive	Off
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	On
		EBD is normal	Off
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	On
		ABS is normal	Off
CRANKING SIG	Crank operation	Crank is active	On
		Crank is inactive	Off

Note 1: Confirm tire pressure is normal.

Note 2: On and off timing for warning lamps and indicator lamps.

- Refer to [BRC-14, "ABS : ABS Function"](#).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[ABS]

< ECU DIAGNOSIS INFORMATION >

- Refer to [BRC-15, "ABS : EBD Function"](#).

Fail-safe

INFOID:000000009365067

ABS FUNCTION

ABS 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 ABS functions. However, EBD functions operate normally.

EBD FUNCTION

ABS warning lamp, brake 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 ABS and EBD functions.

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: • ABS • EBD (only when both rear wheels are malfunctioning)
C1102	When an open circuit is detected in rear LH wheel sensor circuit.	
C1103	When an open circuit is detected in front RH wheel sensor circuit.	
C1104	When an open circuit is detected in front LH wheel sensor circuit.	
C1105	• When a short circuit is detected in rear RH wheel sensor circuit. • When power supply voltage of rear RH wheel sensor is in following state. - Rear RH wheel sensor power supply voltage: $7.2\text{ V} \geq$ Rear RH wheel sensor power supply voltage • When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. • When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal.	
C1106	• When a short circuit is detected in rear LH wheel sensor circuit. • When power supply voltage of rear LH wheel sensor is in following state. - Rear LH wheel sensor power supply voltage: $7.2\text{ V} \geq$ Rear LH wheel sensor power supply voltage • When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. • When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal.	
C1107	• When a short circuit is detected in front RH wheel sensor circuit. • When power supply voltage of front RH wheel sensor is in following state. - Front RH wheel sensor power supply voltage: $7.2\text{ V} \geq$ Front RH wheel sensor power supply voltage • When distance between front RH wheel sensor and front RH wheel sensor rotor is large. • When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal.	
C1108	• When a short circuit is detected in front LH wheel sensor circuit. • When power supply voltage of front LH wheel sensor is in following state. - Front LH wheel sensor power supply voltage: $7.2\text{ V} \geq$ Front LH wheel sensor power supply voltage • When distance between front LH wheel sensor and front LH wheel sensor rotor is large. • When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal.	
C1109	• When ignition power supply voltage is in following state. - Ignition power supply voltage: $10\text{ V} \geq$ Ignition power supply voltage. - Ignition power supply voltage: $16\text{ V} \leq$ Ignition power supply voltage.	The following functions are suspended: • ABS • EBD
C1110	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	
C1111	When there is a failure on the pump motor	The following functions are suspended: • ABS • EBD
C1115	When difference in wheel speed between any wheel and others is detected when the vehicle is driven, because of installation of tires other than specified.	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[ABS]

DTC	Malfunction detected condition	Fail-safe condition
C1120	When a malfunction is detected in front LH ABS IN valve.	The following functions are suspended: • ABS • EBD
C1121	When a malfunction is detected in front LH ABS OUT valve.	
C1122	When a malfunction is detected in front RH ABS IN valve.	
C1123	When a malfunction is detected in front RH ABS OUT valve.	
C1124	When a malfunction is detected in rear LH ABS IN valve.	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	
C1126	When a malfunction is detected in rear RH ABS IN valve.	
C1127	When a malfunction is detected in rear RH ABS OUT valve.	
C1130	When a CAN signal malfunction is detected..	
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended: • ABS • EBD
U1000	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.	
U1010	When detecting error during the initial diagnosis of CAN controller of ABS actuator and electrical unit (control unit).	

DTC Inspection Priority Chart

INFOID:000000009365068

When multiple DTCs are displayed simultaneously, check each one using the following priority list.

Priority	Detected item (DTC)
1	• U1000 CAN COMM CIRCUIT • U1010 CAN COMM CIRCUIT
2	• C1110 CONTROLLER FAILURE
3	• C1130 ENGINE SIGNAL 1 • C1144 ST ANG SEN SIGNAL
4	• C1109 BATTERY VOLTAGE [ABNORMAL] • C1111 PUMP MOTOR • C1140 ACTUATOR RLY
5	• C1101 RR RH SENSOR-1 • C1102 RR LH SENSOR-1 • C1103 FR RH SENSOR-1 • C1104 FR LH SENSOR-1 • C1105 RR RH SENSOR-2 • C1106 RR LH SENSOR-2 • C1107 FR RH SENSOR-2 • C1108 FR LH SENSOR-2 • C1115 ABS SENSOR [ABNORMAL SIGNAL] • C1120 FR LH IN ABS SOL • C1121 FR LH OUT ABS SOL • C1122 FR RH IN ABS SOL • C1123 FR RH OUT ABS SOL • C1124 RR LH IN ABS SOL • C1125 RR LH OUT ABS SOL • C1126 RR RH IN ABS SOL • C1127 RR RH OUT ABS SOL

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[ABS]

DTC Index

INFOID:000000009365069

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	BRC-36, "DTC Logic"
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	BRC-40, "DTC Logic"
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-42, "DTC Logic"
C1110	CONTROLLER FAILURE	BRC-44, "DTC Logic"
C1111	PUMP MOTOR	BRC-45, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-47, "DTC Logic"
C1120	FR LH IN ABS SOL	BRC-49, "DTC Logic"
C1121	FR LH OUT ABS SOL	BRC-51, "DTC Logic"
C1122	FR RH IN ABS SOL	BRC-49, "DTC Logic"
C1123	FR RH OUT ABS SOL	BRC-51, "DTC Logic"
C1124	RR LH IN ABS SOL	BRC-49, "DTC Logic"
C1125	RR LH OUT ABS SOL	BRC-51, "DTC Logic"
C1126	RR RH IN ABS SOL	BRC-49, "DTC Logic"
C1127	RR RH OUT ABS SOL	BRC-51, "DTC Logic"
C1130	ENGINE SIGNAL 1	BRC-53, "DTC Logic"
C1140	ACTUATOR RLY	BRC-54, "DTC Logic"
U1000	CAN COMM CIRCUIT	BRC-56, "DTC Logic"
U1010	CONTROL UNIT [CAN]	BRC-57, "DTC Logic"

BRAKE CONTROL SYSTEM

[ABS]

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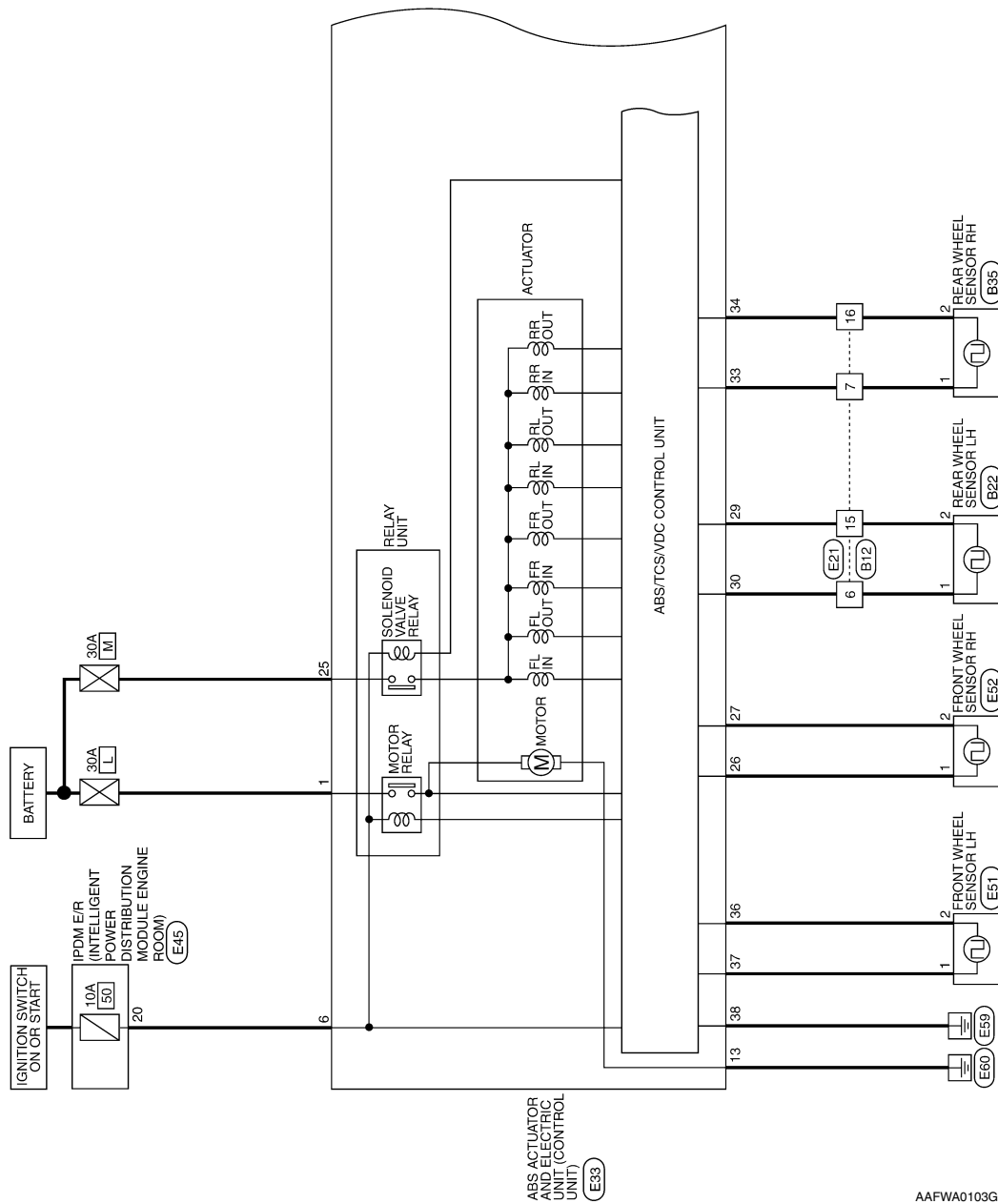
WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:000000009365070

BRAKE CONTROL SYSTEM

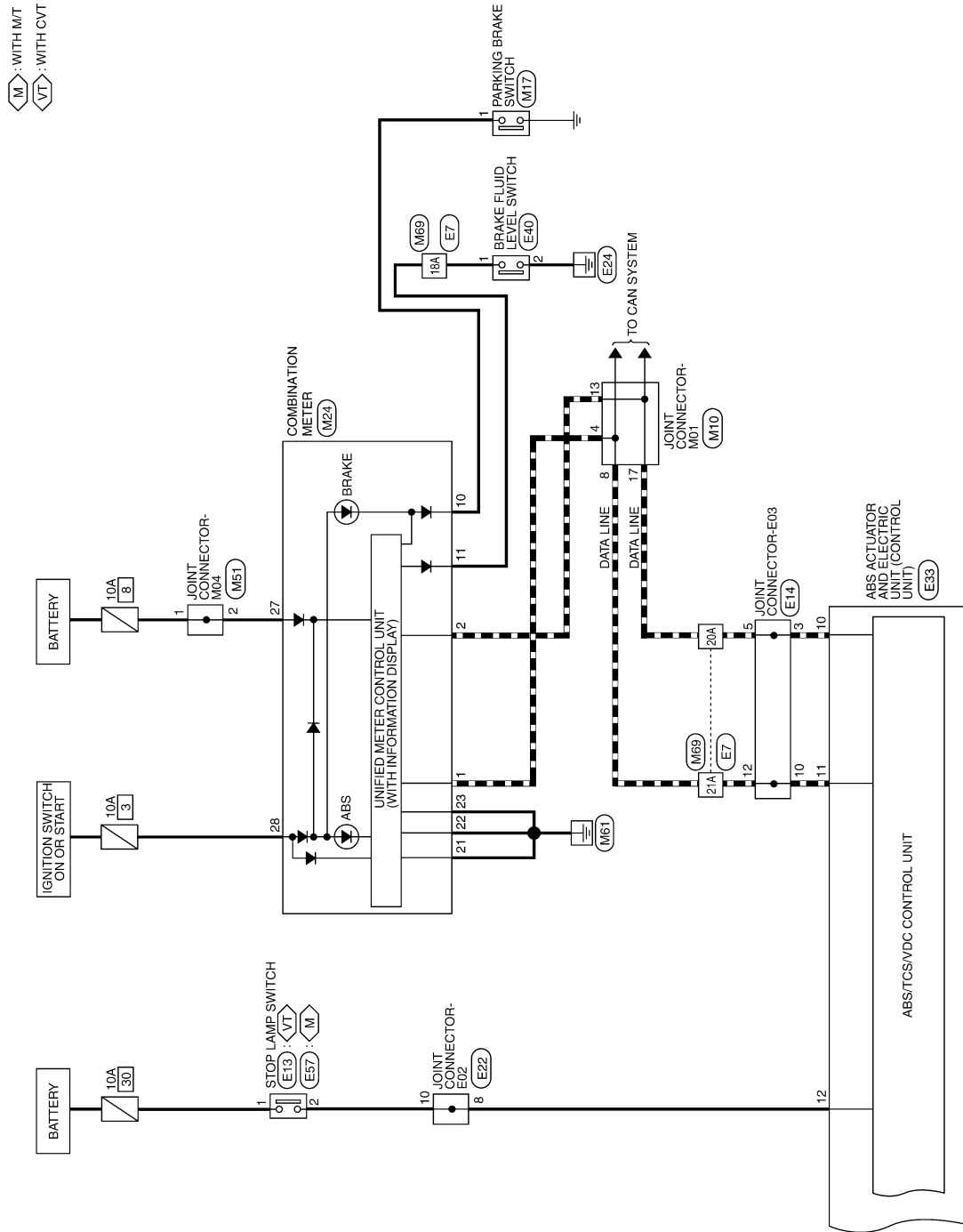


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BRAKE CONTROL SYSTEM

[ABS]

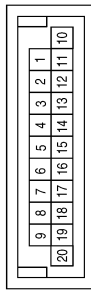
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BRAKE CONTROL SYSTEM CONNECTORS

Connector No.	M10
Connector Name	JOINT CONNECTOR-M01
Connector Color	BLUE



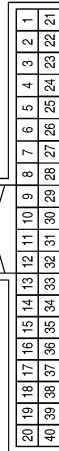
Terminal No.	Color of Wire	Signal Name
4	L	—
8	L	—
13	P	—
17	P	—

Connector No.	M17
Connector Name	PARKING BRAKE SWITCH
Connector Color	BLACK

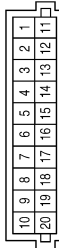


Terminal No.	Color of Wire	Signal Name
1	SB	—

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



Connector No.	M51
Connector Name	JOINT CONNECTOR-M04
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	P	CAN-L
10	SB	PKB SW
11	BR	BRAKE OIL SW
21	B	GND (ILLUMINATION)
22	B	GND (POWER)
23	B/W	GND (CIRCUIT)
27	R/W	BAT
28	GR	IGN

Terminal No.	Color of Wire	Signal Name
1	L/G	—
12	R/W	—

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BRAKE CONTROL SYSTEM

[ABS]

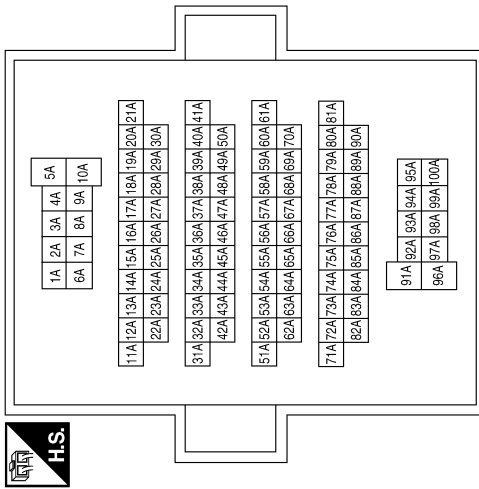
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Connector No.	E13
Connector Name	STOP LAMP SWITCH (WITH CVT)
Connector Color	WHITE



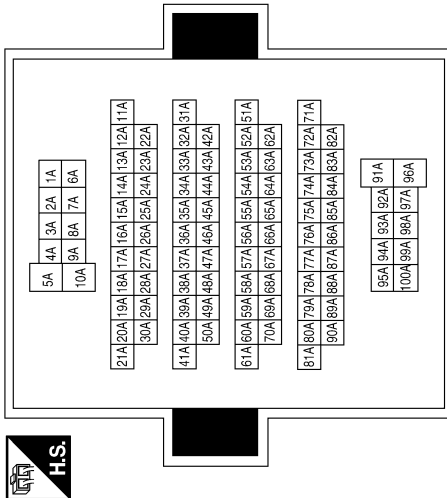
Terminal No.	Color of Wire	Signal Name
1	SB	—
2	LG	—

Connector No.	E7
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
18A	LG	—
20A	P	—
21A	L	—

Connector No.	M69
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
18A	BR	—
20A	P	—
21A	L	—

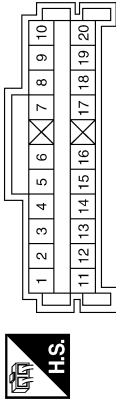
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BRAKE CONTROL SYSTEM

[ABS]

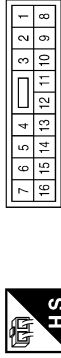
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Connector No.	E22
Connector Name	JOINT CONNECTOR-E02
Connector Color	WHITE



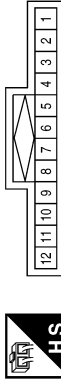
Terminal No.	Color of Wire	Signal Name
8	LG	-
10	LG	-

Connector No.	E21
Connector Name	WIRE TO WIRE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
6	B	-
7	SB	-
15	W	-
16	V	-

Connector No.	E14
Connector Name	JOINT CONNECTOR-E03
Connector Color	BLUE

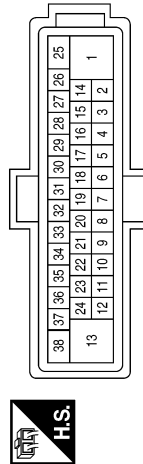


Terminal No.	Color of Wire	Signal Name
3	P	-
5	P	-
10	L	-
12	L	-

Terminal No.	Color of Wire	Signal Name
24	-	-
25	W	ECU SUPPLY
26	LG	WSS FR SIG (-)
27	Y	WSS FR PWR (+)
28	-	-
29	W	WSS RL PWR (+)
30	B	WSS RL SIG (-)
31	-	-
32	-	-
33	SB	WSS RR SIG (-)
34	V	WSS RR PWR (+)
35	-	-
36	R	WSS FL PWR (+)
37	G	WSS FL SIG (-)
38	B	GND (SOL)

Terminal No.	Color of Wire	Signal Name
7	-	-
8	-	-
9	-	-
10	P	CAN-L
11	L	CAN-H
12	LG	BLS
13	B	GND (MTR)
14	-	-
15	-	-
16	-	-
17	-	-
18	-	-
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-

Connector No.	E33
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	MOTOR SUPPLY
2	-	-
3	-	-
4	-	-
5	-	-
6	BR	IGN

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BRAKE CONTROL SYSTEM

[ABS]

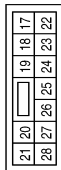
< WIRING DIAGRAM >

Connector No.	E51
Connector Name	FRONT WHEEL SENSOR LH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	G	—
2	R	—

Connector No.	E45
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
20	BR	ABS ECU

Connector No.	E40
Connector Name	BRAKE FLUID LEVEL SWITCH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	LG	—
2	B	—

Connector No.	B12
Connector Name	WIRE TO WIRE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
6	V	—
7	SB	—
15	W	—
16	O	—

Connector No.	E57
Connector Name	STOP LAMP SWITCH (WITH M/T)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	SB	—
2	LG	—

Connector No.	E52
Connector Name	FRONT WHEEL SENSOR RH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	LG	—
2	Y	—

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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[ABS]

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Connector No.	B35
Connector Name	REAR WHEEL SENSOR RH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	SB	-
2	O	-

Connector No.	B22
Connector Name	REAR WHEEL SENSOR LH
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	V	-
2	W	-

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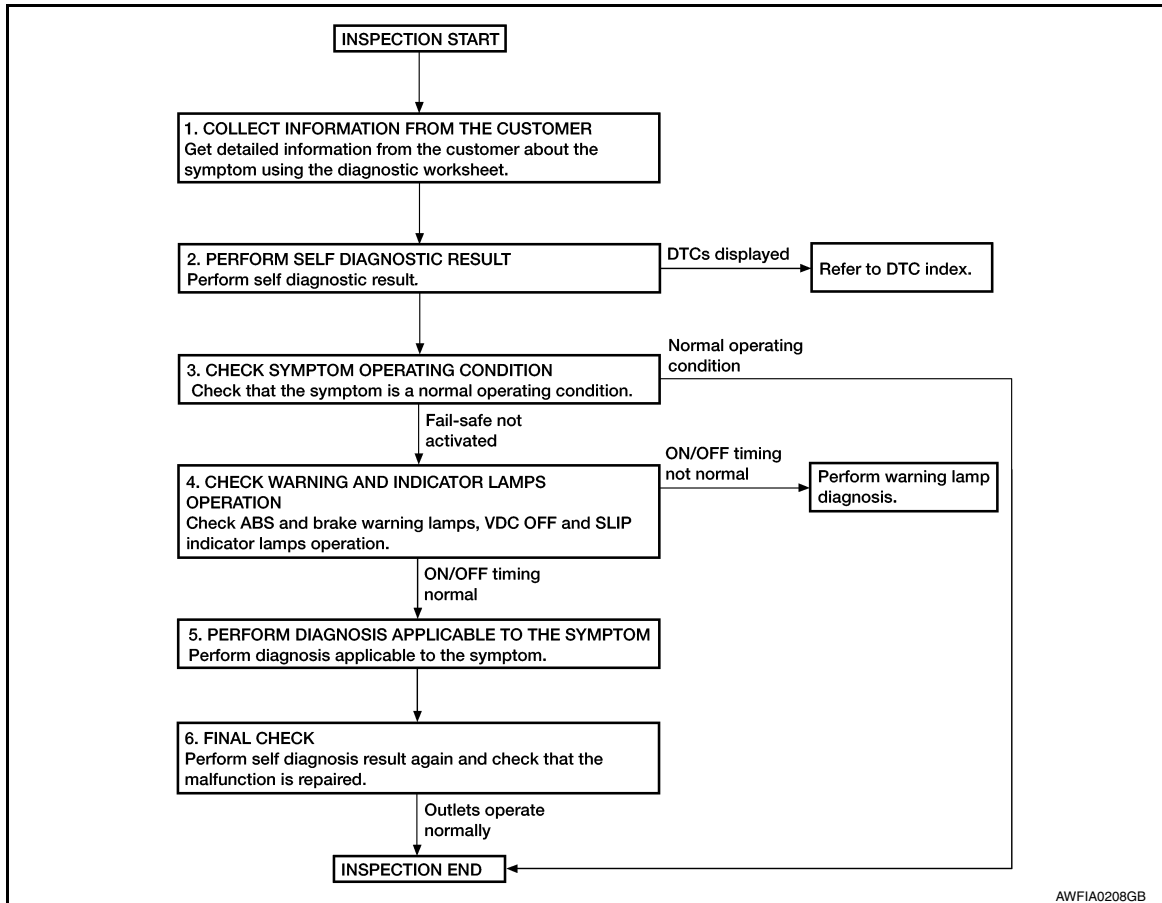
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000009365071

OVERALL SEQUENCE



DETAILED FLOW

1.COLLECT INFORMATION FROM THE CUSTOMER

Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnostic worksheet. Refer to [BRC-35, "Diagnostic Work Sheet"](#).

>> GO TO 2.

2.PERFORM SELF DIAGNOSTIC RESULT

Perform self diagnostic result. Refer to [BRC-19, "CONSULT Function \(ABS\)"](#).

Are any DTCs displayed?

YES >> Refer to [BRC-26, "DTC Index"](#).

NO >> GO TO 3.

3.CHECK SYMPTOM OPERATING CONDITION

Check that the symptom is a normal operating condition. Refer to [BRC-68, "Description"](#).

Is the symptom a normal operating condition?

YES >> Inspection End.

NO >> GO TO 4.

4.CHECK WARNING AND INDICATOR LAMPS OPERATION

Check ABS and brake warning lamps. Refer to [MWI-7, "METER SYSTEM : System Description"](#).

DIAGNOSIS AND REPAIR WORK FLOW

[ABS]

< BASIC INSPECTION >

Is ON/OFF timing normal?

YES >> GO TO 5.

NO >> Perform warning lamp diagnosis. Refer to [BRC-60. "Component Function Check"](#) (ABS warning lamp), [BRC-61. "Component Function Check"](#) (brake warning lamp).

5.PERFORM DIAGNOSIS APPLICABLE TO THE SYMPTOM

Perform diagnosis applicable to the symptom. Refer to [BRC-62. "Symptom Table"](#).

>> GO TO 6.

6.FINAL CHECK

Perform self diagnostic result again, and check that the malfunction is repaired. After checking, erase the self diagnosis memory. Refer to [BRC-19. "CONSULT Function \(ABS\)"](#).

>> Inspection End.

Diagnostic Work Sheet

INFOID:000000009365072

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

SFIA3265E

C1101, C1102, C1103, C1104 WHEEL SENSOR

[ABS]

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Logic

INFOID:000000009549271

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.	- Harness or connector - Wheel sensor - ABS actuator and electric unit (control unit)
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.	
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.	
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

④ With CONSULT.

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

Is DTC C1101, C1102, C1103 or C1104 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-36, "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009549272

Regarding Wiring Diagram information, refer to [BRC-27, "Wiring Diagram"](#).

1.CONFIRM DTC

④ With CONSULT

- Perform self-diagnostic result of ABS and record all active DTCs.
- Clear all DTCs.
- Perform DTC confirmation procedure. Refer to [BRC-36, "DTC Logic"](#).

Does DTC C1101, C1102, C1103 or C1104 reset?

- YES >> GO TO 2.
NO >> Refer to [GI-41, "Intermittent Incident"](#).

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.

3.HARNESS AND CONNECTOR INSPECTION

C1101, C1102, C1103, C1104 WHEEL SENSOR

[ABS]

< DTC/CIRCUIT DIAGNOSIS >

1. Disconnect ABS actuator and electric unit (control unit) connector E33 and wheel sensor connector of suspect wheel.
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 [BRC-69, "FRONT WHEEL SENSOR : Removal and Installation"](#) or [BRC-70, "REAR WHEEL SENSOR : Removal and Installation"](#).

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	Voltage
Wheel	Connector	Terminal		
Front LH	E51	1	—	0V
		2		
Front RH	E52	1		
		2		
Rear LH	B22	1		
		2		
Rear RH	B35	1		
		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		

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

Front LH	E51	1	—	No
		2		
Front RH	E52	1		
		2		
Rear LH	B22	1		
		2		
Rear RH	B35	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.

Wheel Sensor		(+)	(-)	Continuity
Wheel	Connector	Terminal	Terminal	
Front LH	E51	1	2	No
Front RH	E52			
Rear LH	B22			
Rear RH	B35			

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 E33 and harness connector of suspect wheel sensor.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E33	37	E51	1	Yes
		36		2	
26		E52	1		
27			2		
30		B22	1		
29			2		
33		B35	1		
34			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 E33 terminal and ground.

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E33	6	—	Ignition switch ON	Battery voltage
			Ignition switch OFF	0V

Is the inspection result normal?

YES >> GO TO 10.

NO >> Check the following:

- 10A fuse No. 50 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 E33 terminals and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E33	13	Ground	Yes
	38		

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 E33.
2. Turn ignition switch ON.
3. Check voltage between suspect wheel sensor harness connector terminals.

Wheel Sensor		(+)	(-)	Voltage (Approx.)
Wheel	Connector	Terminal	Terminal	
Front LH	E51	1	2	Battery voltage
Front RH	E52			
Rear LH	B22			
Rear RH	B35			

Is the inspection result normal?

YES >> Replace wheel sensor. Refer to [BRC-69, "FRONT WHEEL SENSOR : Removal and Installation"](#) or [BRC-70, "REAR WHEEL SENSOR : Removal and Installation"](#). Then, GO TO 12.

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).

12.CONFIRM REPAIR

Ⓔ With CONSULT

1. Clear all DTCs.
2. Perform DTC confirmation procedure. Refer to [BRC-36, "DTC Logic"](#).

Does DTC C1105, C1106, C1107 or C1108 reset?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).

NO >> Inspection End.

C1105, C1106, C1107, C1108 WHEEL SENSOR

[ABS]

< DTC/CIRCUIT DIAGNOSIS >

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Logic

INFOID:000000009549273

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.	- Wheel sensor - ABS actuator and electric unit (control unit) - Sensor rotor
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.	
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.	
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

④ With CONSULT.

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

Is DTC C1105, C1106, C1107 or C1108 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-40, "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009549274

Regarding Wiring Diagram information, refer to [BRC-27, "Wiring Diagram"](#).

1.CONFIRM DTC

④ With CONSULT

- Perform self-diagnostic result of ABS and record all active DTCs.
- Clear all DTCs.
- Perform DTC confirmation procedure. Refer to [BRC-36, "DTC Logic"](#).

Does DTC C1105, C1106, C1107 or C1108 reset?

- YES >> GO TO 2.
NO >> Refer to [GI-41, "Intermittent Incident"](#).

2.CHECK TIRE PRESSURE AND TIRE WEAR

Check tires for excessive wear and proper inflation. Refer to [WT-4, "Inspection"](#).

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

[ABS]

< 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 [BRC-69, "FRONT WHEEL SENSOR : Removal and Installation"](#) or [BRC-70, "REAR WHEEL SENSOR : Removal and Installation"](#). Then, GO TO 5.

NO >> Repair or replace as necessary.

5.CONFIRM REPAIR

④ With CONSULT

1. Clear all DTCs.
2. Perform DTC confirmation procedure. Refer to [BRC-36, "DTC Logic"](#).

Does DTC C1105, C1106, C1107 or C1108 reset?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).

NO >> Inspection End.

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C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

C1109 POWER AND GROUND SYSTEM

DTC Logic

INFOID:000000009365081

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

④ With CONSULT.

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

Is DTC C1109 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-42, "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009365082

Regarding Wiring Diagram information, refer to [BRC-27, "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 E33 terminal 28 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage
Connector	Terminal			
E33	6	—	Ignition switch ON	Battery voltage
			Ignition switch OFF	0V

Is the inspection result normal?

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

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

1. Turn ignition switch OFF.
2. Check continuity between ABS actuator and electric unit (control unit) connector E33 terminals 13, 38 and ground.

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E33	13	Ground	Yes
	38		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.

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C1110 CONTROL FAILURE

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

C1110 CONTROL FAILURE

DTC Logic

INFOID:000000009365083

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	• ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE
EMERGENCY BRAKE
VARIANT CODING

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-44. "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009365084

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

CAUTION:

Replace ABS actuator and electric unit (control unit) when self diagnostic result shows items other than those applicable.

- >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73. "Removal and Installation"](#).

C1111 PUMP MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

C1111 PUMP MOTOR

DTC Logic

INFOID:000000009365085

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

ⓘ With CONSULT.

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

Is DTC C1111 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-45, "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009365086

Regarding Wiring Diagram information, refer to [BRC-27, "Wiring Diagram"](#).

1.CONNECTOR INSPECTION

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connectors.
- 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 E33 terminal 1 and ground.

ABS actuator and electric unit (control unit)		—	Voltage
Connector	Terminal		
E33	1	Ground	Battery voltage

Is the inspection result normal?

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

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

Check continuity between ABS actuator and electric unit (control unit) connector E33 terminals 13, 38 and ground.

C1111 PUMP MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E33	13	Ground	Yes
	38		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.

C1115 ABS SENSOR [ABNORMAL SIGNAL]

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

C1115 ABS SENSOR [ABNORMAL SIGNAL]

DTC Logic

INFOID:000000009365087

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

☑ With CONSULT.

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

Is DTC C1115 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-47, "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009365088

Regarding Wiring Diagram information, refer to [BRC-27, "Wiring Diagram"](#).

CAUTION:

Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector E33 and wheel sensor connector of wheel with DTC.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

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

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

- YES >> GO TO 3.
NO >> Replace the wheel sensor. Refer to [BRC-69, "FRONT WHEEL SENSOR : Removal and Installation"](#) (front) or [BRC-70, "REAR WHEEL SENSOR : Removal and Installation"](#) (rear).

3.CHECK TIRES

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

Is the inspection result normal?

C1115 ABS SENSOR [ABNORMAL SIGNAL]

[ABS]

< 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		
Front LH	E51	1	—	No
		2		
Front RH	E52	1		
		2		
Rear LH	B22	1		
		2		
Rear RH	B35	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 E33 and wheel sensor connector of wheel with DTC.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	Yes
Front LH	E33	37	E51	1	
		36		2	
Front RH		26	E52	1	
		27		2	
Rear LH		30	B22	1	
		29		2	
Rear RH		33	B35	1	
		34		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).

NO >> Repair the circuit.

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Logic

INFOID:000000009365091

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

 With CONSULT.

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

Is DTC C1120, C1122, C1124 or C1126 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-49, "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009365092

Regarding Wiring Diagram information, refer to [BRC-27, "Wiring Diagram"](#).

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check connector 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 E33 terminal 25 and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E33	25	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 E33 terminals 13, 38 and ground.

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E33	13	Ground	Yes
	38		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Logic

INFOID:000000009365093

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

④ With CONSULT.

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

Is DTC C1121, C1123, C1125 or C1127 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-51, "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009365094

Regarding Wiring Diagram information, refer to [BRC-27, "Wiring Diagram"](#).

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check connector 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 E33 terminal 25 and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E33	25	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 E33 terminals 13, 38 and ground.

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E33	13	Ground	Yes
	38		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

C1130 ENGINE SIGNAL

DTC Logic

INFOID:000000009365095

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

Ⓔ With CONSULT.

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

Is DTC C1130 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-53, "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009365096

1.CHECK SELF DIAGNOSTIC RESULT FOR ENGINE SYSTEM

Ⓔ With CONSULT.

Perform self diagnostic result. Refer to [EC-53, "CONSULT Function"](#).

Are any ECM DTCs detected?

- YES >> Refer to [EC-76, "DTC Index"](#).
NO >> GO TO 2.

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

Ⓔ With CONSULT.

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

Is DTC C1130 detected?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).
NO >> Check pin terminals and connection of connectors for abnormal conditions. Repair or replace malfunctioning components.

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

C1140 ACTUATOR RELAY SYSTEM

DTC Logic

INFOID:000000009365097

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

④With CONSULT.

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

Is DTC C1140 detected?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-54, "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009365098

Regarding Wiring Diagram information, refer to [BRC-27, "Wiring Diagram"](#).

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check connector 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 E33 terminal 25 and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E33	25	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 E33 terminals 13, 38 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E33	13	Ground	Yes
	38		

C1140 ACTUATOR RELAY SYSTEM

[ABS]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES
- >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).
- NO
- >> Repair or replace malfunctioning components.

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U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

U1000 CAN COMM CIRCUIT

DTC Logic

INFOID:000000009365112

DTC DETECTION LOGIC

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

Diagnosis Procedure

INFOID:000000009365113

1. CHECK DTC DETECTION

Ⓔ With CONSULT.

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

Is DTC U1000 detected?

- YES >> Proceed to diagnosis procedure. Refer to [LAN-15. "Trouble Diagnosis Flow Chart"](#).
NO >> Refer to [GI-41. "Intermittent Incident"](#).

U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

U1010 CONTROL UNIT (CAN)

Description

INFOID:000000009452284

Initial diagnosis of ABS actuator and electric unit (control unit)

DTC Logic

INFOID:000000009452285

DTC DETECTION LOGIC

DTC	Items (CONSULT screen terms)	DTC detection condition	Possible cause
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

ⓘ With CONSULT.

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

Is DTC U1010 detected?

YES >> Proceed to diagnosis procedure. Refer to [BRC-57, "Diagnosis Procedure"](#).
NO >> Inspection End.

Diagnosis Procedure

INFOID:000000009452286

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

Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).

>> Inspection End.

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

PARKING BRAKE SWITCH

Component Function Check

INFOID:000000009365116

1.CHECK PARKING BRAKE SWITCH OPERATION

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-58, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000009365117

Regarding Wiring Diagram information, refer to [BRC-27, "Wiring Diagram"](#).

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

2.CHECK PARKING BRAKE SWITCH

Check parking brake switch. Refer to [BRC-59, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace parking brake switch. Refer to [PB-6, "Exploded View"](#).

3.CHECK PARKING BRAKE SWITCH SIGNAL

④With CONSULT.

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

Condition	DATA MONITOR
Actuate parking brake	On
Release parking brake	Off

Is the inspection result normal?

YES >> Refer to [BRC-34, "Work Flow"](#).

NO >> GO TO 4.

4.CHECK PARKING BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter and parking brake switch connectors.
3. Check continuity between combination meter connector and parking brake switch connector M17 terminal 1.

Combination meter		Parking brake switch		Continuity
Connector	Terminal	Connector	Terminal	
M24	10	M17	1	Yes

4. Check continuity between combination meter connector and ground.

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

Combination meter		—	Continuity
Connector	Terminal		
M24	10	Ground	No

Is the inspection result normal?

- YES >> Replace combination meter. Refer to [MWI-48, "Removal and Installation"](#).
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:000000009365118

1.CHECK PARKING BRAKE SWITCH

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

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

Is the inspection result normal?

- YES >> Inspection End.
NO >> Replace parking brake switch. Refer to [PB-6, "Exploded View"](#).

ABS WARNING LAMP

Component Function Check

INFOID:000000009365122

1.CHECK ABS WARNING LAMP FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-60, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000009365123

1.PERFORM THE SELF-DIAGNOSIS

④With CONSULT.

Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to [BRC-26, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-7, "METER SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-48, "Removal and Installation"](#).

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[ABS]

BRAKE WARNING LAMP

Component Function Check

INFOID:000000009365124

1.CHECK BRAKE WARNING LAMP FUNCTION (1)

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to [BRC-61. "Diagnosis Procedure"](#).

2.CHECK BRAKE WARNING LAMP FUNCTION (2)

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check parking brake switch system. Refer to [BRC-58. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000009365125

BRC

1.PERFORM THE SELF-DIAGNOSIS

Ⓔ With CONSULT.

Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to [BRC-26. "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-7. "METER SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-73. "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-48. "Removal and Installation"](#).

SYMPTOM DIAGNOSIS

ABS

Symptom Table

INFOID:000000009365130

If ABS warning lamp turns ON, perform self-diagnosis.

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-63, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-64, "Diagnosis Procedure"
	Make sure the braking force is sufficient when the ABS is not operating.	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-65, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-66, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-67, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	

NOTE:

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

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[ABS]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:000000009365131

1.CHECK START

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles. Refer to front: [FSU-6. "Inspection"](#), rear: [RSU-5. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following:

- Wheel sensor installation for damage
- Sensor rotor installation for damage
- Wheel sensor connector
- Wheel sensor harness

Is the inspection result normal?

YES >> GO TO 4.

- NO >> • Replace wheel sensor [BRC-69. "FRONT WHEEL SENSOR : Removal and Installation"](#) (front) or [BRC-70. "REAR WHEEL SENSOR : Removal and Installation"](#) (rear).
- Replace sensor rotor [BRC-72. "FRONT SENSOR ROTOR : Removal and Installation"](#) (front) or [BRC-72. "REAR SENSOR ROTOR : Removal and Installation"](#) (rear).
- Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Perform self diagnostic result. Refer to [BRC-19. "CONSULT Function \(ABS\)"](#).

UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS >

[ABS]

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:000000009365132

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to [BR-8, "Inspection and Adjustment"](#).

Is the stroke too big?

- YES >> • Bleed air from brake line and hose. Refer to [BR-12, "Bleeding Brake System"](#).
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: [BR-8, "Inspection and Adjustment"](#) or brake booster assembly [BR-14, "Inspection"](#).

NO >> GO TO 2.

2.CHECK ABS FUNCTION

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

Is the inspection result normal?

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

THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[ABS]

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:000000009365133

CAUTION:

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

1. CHECK ABS FUNCTION

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

Is the inspection result normal?

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

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ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[ABS]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:000000009365134

CAUTION:

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

1.CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Perform self diagnostic result. Refer to [BRC-19, "CONSULT Function \(ABS\)"](#).

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[ABS]

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:000000009365135

CAUTION:

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

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

1. SYMPTOM CHECK 1

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

Do symptoms occur?

YES >> GO TO 2.

NO >> Inspect the brake pedal.

2. SYMPTOM CHECK 2

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

Do symptoms occur?

YES >> GO TO 3.

NO >> Perform self diagnostic result. Refer to [BRC-19. "CONSULT Function \(ABS\)".](#)

3. SYMPTOM CHECK 3

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

Do symptoms occur?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.

NO >> Inspection End.

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[ABS]

NORMAL OPERATING CONDITION

Description

INFOID:000000009365137

Symptom	Result
Slight vibrations are felt on the brake pedal and operation noises occur when ABS is activated.	This is a normal condition due to the ABS activation.
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	
The brake pedal vibrates and motor operation noises occur from the engine room after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.

WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[ABS]

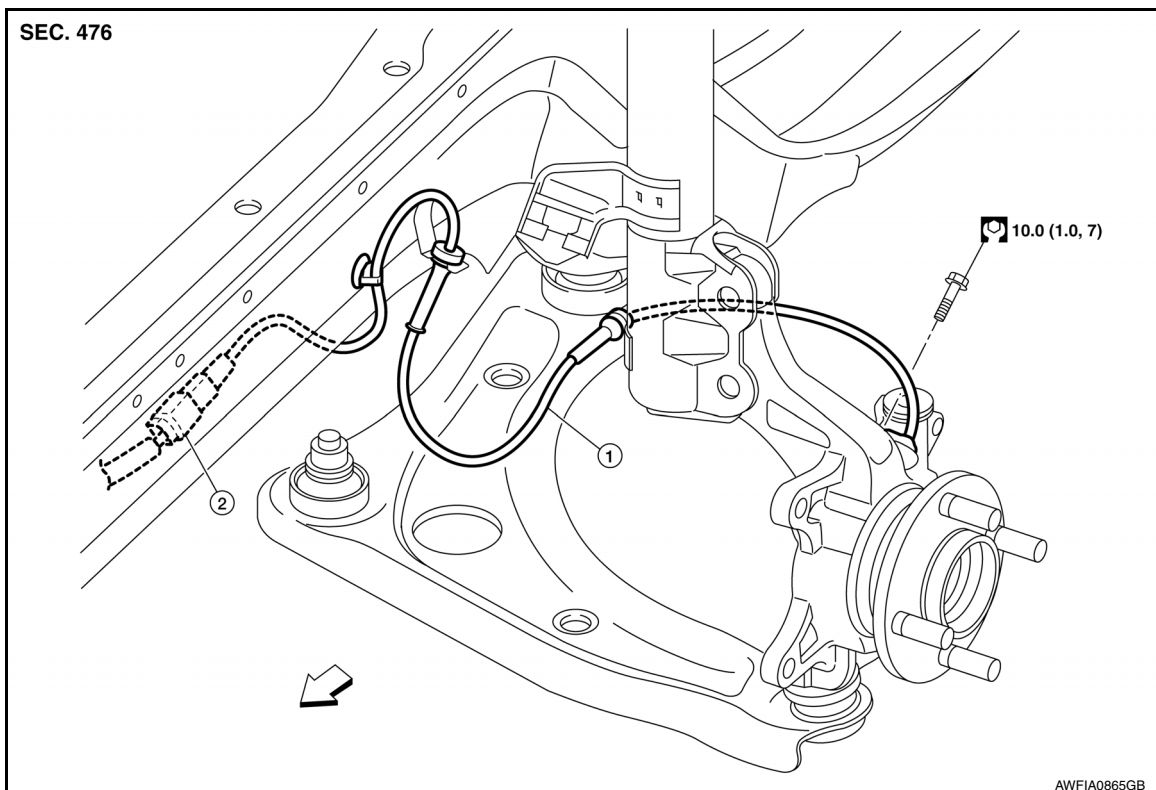
REMOVAL AND INSTALLATION

WHEEL SENSOR

FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:000000009619489



1. Front wheel sensor

2. Harness connector

← Front

FRONT WHEEL SENSOR : Removal and Installation

INFOID:000000009619490

CAUTION:

- Be careful not to damage front wheel sensor edge and sensor rotor teeth.
- When removing the front wheel hub, first remove the front wheel sensor from the steering knuckle. Failure to do so may result in damage to the front wheel sensor, 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 sensor rotor. Fix as necessary and then install the front wheel sensor.

REMOVAL

1. Remove wheel and tire using power tool. Refer to [WT-8, "Removal and Installation"](#).
2. Remove fender protector. Refer to [EXT-24, "Removal and Installation"](#).
3. Disconnect the harness connector from the front wheel sensor.
4. Remove bolt and front wheel sensor from steering knuckle.
5. Release front wheel sensor harness clips from the vehicle.

INSTALLATION

Installation is in the reverse order of the removal.

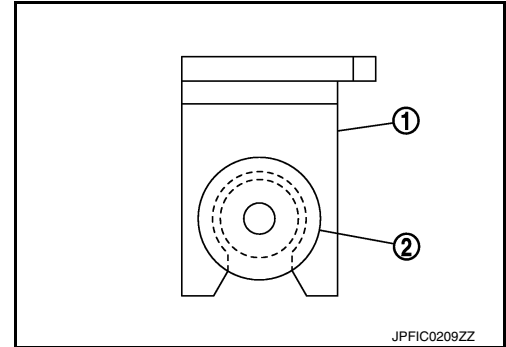
WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[ABS]

CAUTION:

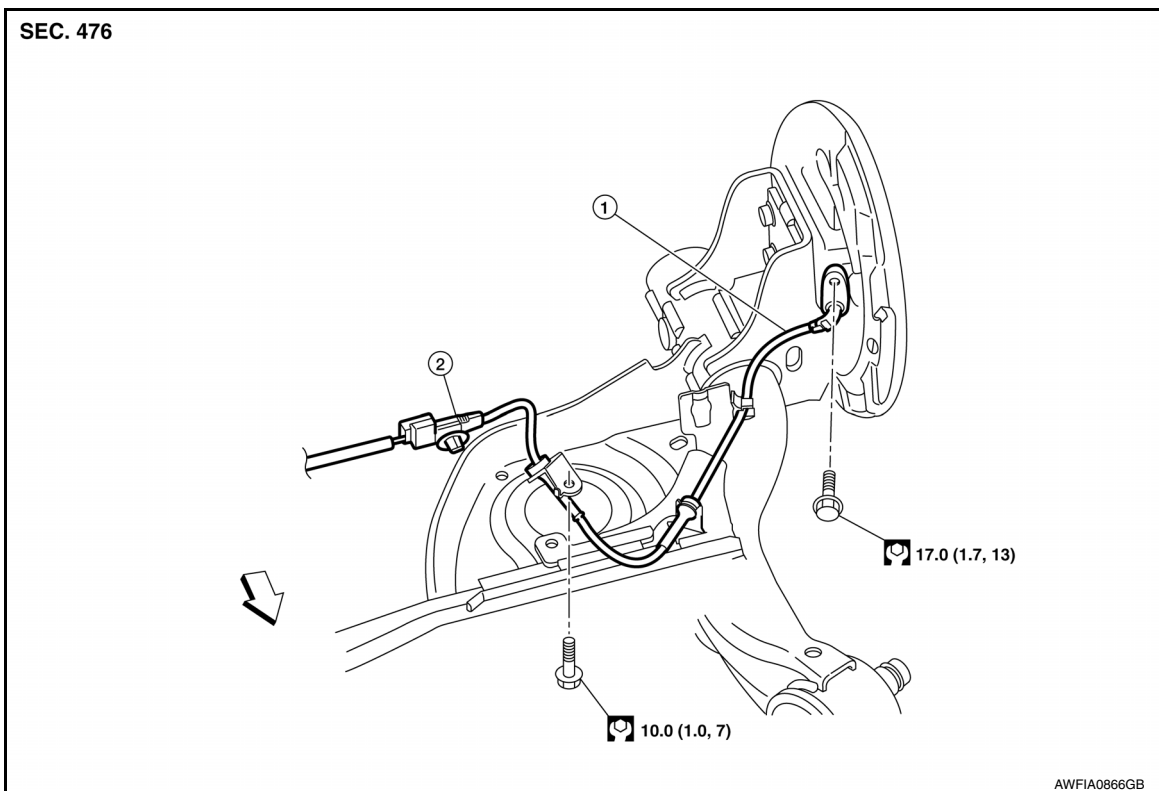
Do not twist front wheel sensor harness when installing front wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that front wheel sensor harness is not twisted after installation.



REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:000000009619491



1. Rear wheel sensor

2. Harness connector

← Front

REAR WHEEL SENSOR : Removal and Installation

INFOID:000000009619492

CAUTION:

- Be careful not to damage rear wheel sensor edge and sensor rotor teeth.
- When removing the rear wheel hub, first remove the rear wheel sensor from the back plate. Failure to do so may result in damage to the rear wheel sensor, 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 back plate for the rear wheel sensor, or if a foreign object is caught in the surface of the sensor rotor. Fix as necessary and then install the rear wheel sensor.

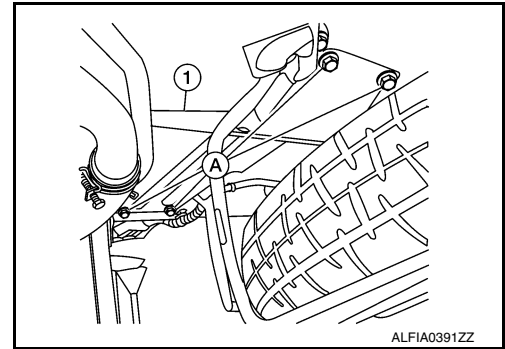
REMOVAL

WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[ABS]

1. Remove bolts (A) and support bracket (1) (LH side only).



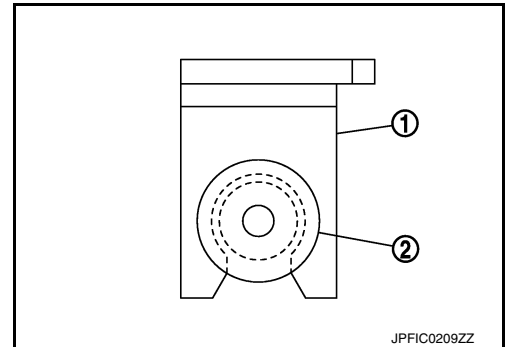
2. Disconnect the harness connector from the rear wheel sensor.
3. Release rear wheel sensor harness clips from the vehicle.
4. Remove bolts and rear wheel sensor from back plate.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

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.



A
B
C
D
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BRC
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O
P

SENSOR ROTOR

< REMOVAL AND INSTALLATION >

[ABS]

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Removal and Installation

INFOID:0000000009619493

REMOVAL

Remove sensor rotor from steering knuckle. Refer to [FAX-9, "Exploded View"](#).

INSTALLATION

Installation is in the reverse order of removal.

REAR SENSOR ROTOR

REAR SENSOR ROTOR : Removal and Installation

INFOID:0000000009619494

REMOVAL

Remove sensor rotor from brake drum. Refer to [BR-40, "Exploded View"](#).

CAUTION:

Do not reuse rear sensor rotor.

INSTALLATION

Installation is in the reverse order of removal.

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

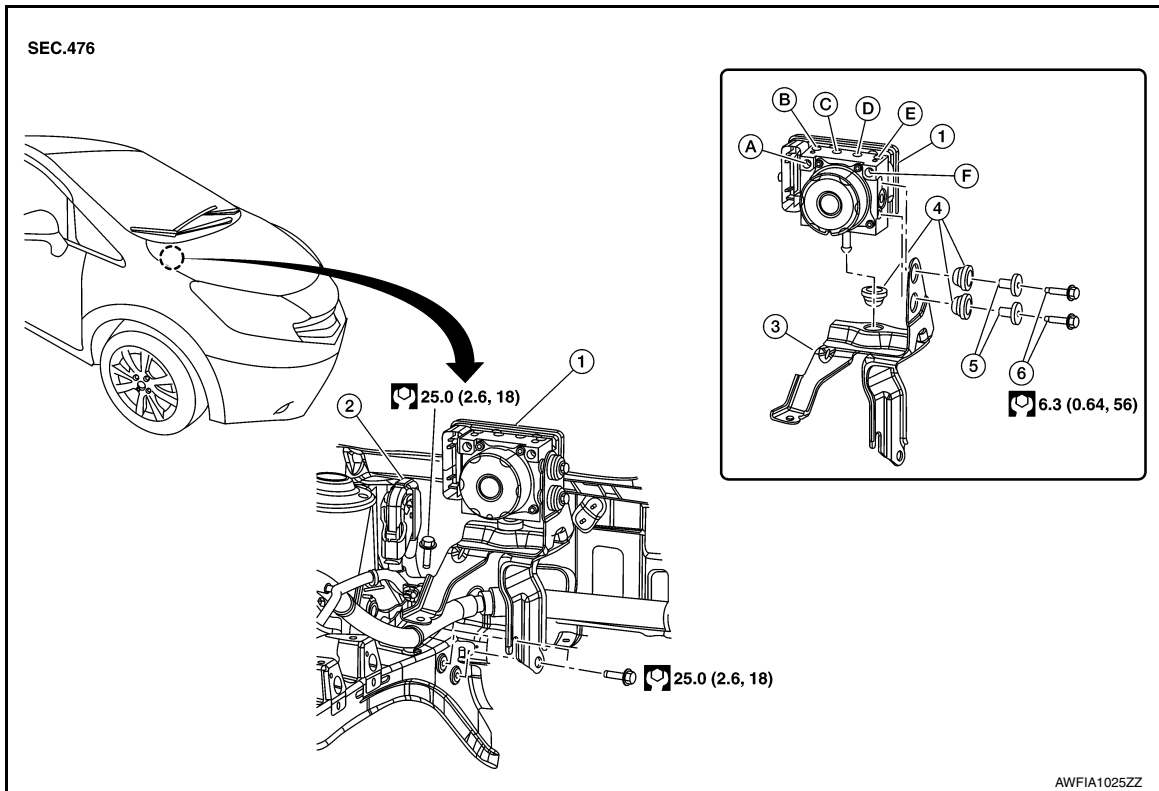
< REMOVAL AND INSTALLATION >

[ABS]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

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- | | | |
|--|--|------------------------------------|
| 1. ABS actuator and electric unit (control unit) | 2. ABS actuator and electric unit (control unit) harness connector | 3. Bracket |
| 4. Bushing | 5. Insulating clip | 6. Bolt |
| A. To master cylinder secondary side | B. To rear brake tube (RH) | C. To front brake tube (LH) |
| D. To front brake tube (RH) | E. To rear brake tube (LH) | F. To master cylinder primary side |

Removal and Installation

INFOID:0000000009619496

REMOVAL

CAUTION:

- Before servicing, disconnect the battery cable from negative terminal.
- 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.

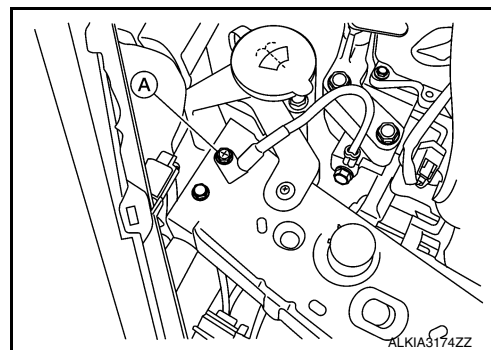
1. Disconnect negative battery cable. Refer to [PG-69, "Removal and Installation \(Battery\)"](#).
2. Disconnect vacuum hose from intake manifold. Refer to [BR-32, "Exploded View"](#).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[ABS]

< REMOVAL AND INSTALLATION >

3. Remove ground harness bolt (A) and ground harness from radiator core support.



4. Disconnect high-pressure pipe from expansion valve. Refer to [HA-27, "Exploded View"](#).
CAUTION:
Cap or wrap the joint of the A/C piping and expansion valve with suitable material such as vinyl tape to avoid the entry of air.
5. Remove low-pressure flexible hose. Refer to [HA-27, "LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation"](#).
6. Loosen flare nut from brake tubes using a flare nut wrench, then remove brake tubes from ABS actuator and electric unit (control unit). Refer to [BR-21, "FRONT : Exploded View"](#).
7. Disconnect the harness connector from the ABS actuator and electric unit (control unit).
8. Remove ABS actuator and electric unit (control unit) bracket bolts.
9. Remove the ABS actuator and electric unit (control unit) and bracket as an assembly.
10. Remove bracket and bushing from ABS actuator and electric unit (if necessary).

INSTALLATION

Installation is in the reverse order of removal.

- Bleed the brake system. Refer to [BR-12, "Bleeding Brake System"](#).

CAUTION:

- Replace the ABS actuator and electric unit (control unit) if it has been dropped or sustained an impact.
- Do not install actuator by holding harness.
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure harness connector is securely locked.