SECTION BRAKE CONTROL SYSTEM

А

В

С

D

Е

CONTENTS

WITHOUT ESP

PRECAUTION6
PRECAUTIONS
Precaution Necessary for Steering Wheel Rota- tion after Battery Disconnect
SYSTEM DESCRIPTION9
COMPONENT PARTS9Component Parts Location9Component Description10Wheel Sensor and Sensor Rotor11ABS Actuator and Electric Unit (Control Unit)11Stop Lamp Switch12
SYSTEM13System Description13Fail-safe19
ABS FUNCTION
EBD FUNCTION
DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]24 CONSULT-III Function
ECU DIAGNOSIS INFORMATION27
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Fail-safe	BR
WIRING DIAGRAM32	G
BRAKE CONTROL SYSTEM32 Wiring Diagram32	Н
BASIC INSPECTION33	
DIAGNOSIS AND REPAIR WORK FLOW33 Work Flow	I
DTC/CIRCUIT DIAGNOSIS	J
C1101, C1102, C1103, C1104 WHEEL SEN- SOR	K
C1105, C1106, C1107, C1108 WHEEL SEN- SOR	L
Diagnosis Procedure40 C1109 POWER AND GROUND SYSTEM45 DTC Logic45 Diagnosis Procedure45	Ν
C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)47 DTC Logic47 Diagnosis Procedure47	O
C1111 ABS MOTOR, MOTOR RELAY SYS- TEM	P
C1115 WHEEL SENSOR50	

DTC Logic50

Diagnosis Procedure	. 50
C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM	EG
DTC Logic Diagnosis Procedure	. 56
C1121, C1123, C1125, C1127 ABS OUT	. 50
VALVE SYSTEM	. 58
DTC Logic	
Diagnosis Procedure	. 58
C1140 ACTUATOR RELAY SYSTEM	. 60
DTC Logic	
Diagnosis Procedure	
U1000 CAN COMM CIRCUIT	
Description	
DTC Logic Diagnosis Procedure	
-	
U1010 CONTROL UNIT (CAN)	
Description	
DTC Logic Diagnosis Procedure	
POWER SUPPLY AND GROUND CIRCUIT Diagnosis Procedure	
STOP LAMP SWITCH	
Component Function Check	
Diagnosis Procedure	
Component Inspection	
PARKING BRAKE SWITCH	
Component Function Check Diagnosis Procedure	
Component Inspection	
BRAKE FLUID LEVEL SWITCH	
Component Function Check Diagnosis Procedure	
Component Inspection	
ABS WARNING LAMP Component Function Check	
Diagnosis Procedure	
-	
BRAKE WARNING LAMP Component Function Check	
Diagnosis Procedure	
SYMPTOM DIAGNOSIS	76
EXCESSIVE OPERATION FREQUENCY	
Description Diagnosis Procedure	
-	
UNEXPECTED BRAKE PEDAL REACTION	
Description Diagnosis Procedure	. 77 77

THE BRAKING DISTANCE IS LONG
Diagnosis Procedure
DOES NOT OPERATE 80
Description80
Diagnosis Procedure80
BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS81
Description81 Diagnosis Procedure81
VEHICLE JERKS DURING
Description
Diagnosis Procedure82
NORMAL OPERATING CONDITION 83 Description
REMOVAL AND INSTALLATION 84
WHEEL SENSOR 84
FRONT WHEEL SENSOR84
FRONT WHEEL SENSOR : Exploded View
FRONT WHEEL SENSOR : Removal and Instal-
lation84
REAR WHEEL SENSOR85
REAR WHEEL SENSOR : Exploded View
REAR WHEEL SENSOR : Removal and Installa-
tion
SENSOR ROTOR 88
FRONT SENSOR ROTOR88
FRONT SENSOR ROTOR : Removal and Instal-
lation88
REAR SENSOR ROTOR88
REAR SENSOR ROTOR : Removal and Installa-
tion
ABS ACTUATOR AND ELECTRIC UNIT
(CONTROL UNIT) 89
Exploded View
Removal and Installation90
WITH ESP
HOW TO USE THIS MANUAL 92
HOW TO USE THIS SECTION
PRECAUTION
PRECAUTIONS
Precaution for Supplemental Restraint System
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-
SIONER"

Precaution Necessary for Steering Wheel Rota-
tion after Battery Disconnect
Precaution for Procedure without Cowl Top Cover94
Precaution for Brake System
Precaution for Brake Control system
Precaution for Harness Repair96
SYSTEM DESCRIPTION97
COMPONENT PARTS97
Component Parts Location97
Component Description
Wheel Sensor and Sensor Rotor
ABS Actuator and Electric Unit (Control Unit) 103
ESP pressure Sensor
Brake Switch/Brake Pedal Position Switch
Steering Angle Sensor
Yaw Rate/Side/Decel G Sensor
ESP OFF Switch
Brake Fluid Level Switch
Parking Brake Switch
-
SYSTEM105
System Description105
Fail-safe117
ESP FUNCTION
ESP FUNCTION : System Description
TCS FUNCTION123
TCS FUNCTION : System Description124
ABS FUNCTION125
ABS FUNCTION : System Description
EBD FUNCTION127
EBD FUNCTION : System Description
BRAKE LIMITED SLIP DIFFERENTIAL (BLSD)
FUNCTION
BRAKE LIMITED SLIP DIFFERENTIAL (BLSD)
FUNCTION : System Description
DIAGNOSIS SYSTEM [ABS ACTUATOR
AND ELECTRIC UNIT (CONTROL UNIT)] 131
CONSULT-III Function131
ECU DIAGNOSIS INFORMATION
ABS ACTUATOR AND ELECTRIC UNIT
(CONTROL UNIT)136
Reference Value
Fail-safe
DTC Inspection Priority Chart
DTC Index142
WIRING DIAGRAM144
BRAKE CONTROL SYSTEM144
Wiring Diagram

BASIC INSPECTION 145	5
DIAGNOSIS AND REPAIR WORK FLOW 145	
Work Flow145 Diagnostic Work Sheet146	
ADDITIONAL SERVICE WHEN REPLACING ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	
ADJUSTMENT OF STEERING ANGLE SEN- SOR NEUTRAL POSITION)
Work Procedure	
C1101, C1102, C1103, C1104 WHEEL SEN- SOR	I
DTC Logic151 Diagnosis Procedure151	
C1105, C1106, C1107, C1108 WHEEL SEN-	
SOR	1
C1109 POWER AND GROUND SYSTEM 160 DTC Logic)
C1110, C1170 ABS ACTUATOR AND ELEC- TRIC UNIT (CONTROL UNIT)	2
C1111 ABS MOTOR, MOTOR RELAY SYS- TEM	3
C1113, C1145, C1146 YAW RATE/SIDE/DE- CEL G SENSOR	5
C1115 WHEEL SENSOR	3 3
C1116 STOP LAMP SWITCH	1 1 1
C1120, C1122, C1124, C1126 ABS IN VALVE	`
SYSTEM)

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM	181
DTC Logic	.181
Diagnosis Procedure	.181
C1130 ENGINE SIGNAL	
DTC Logic Diagnosis Procedure	.183
-	
C1140 ACTUATOR RELAY SYSTEM DTC Logic	
Diagnosis Procedure	
C1142 PRESS SENSOR	
DTC Logic Diagnosis Procedure	
C1143 STEERING ANGLE SENSOR DTC Logic	
Diagnosis Procedure	
C1144 INCOMPLETE STEERING ANGLE	
SENSOR ADJUSTMENT	191
DTC Logic	.191
Diagnosis Procedure	.191
C1155 BRAKE FLUID LEVEL SWITCH	192
DTC Logic	
Diagnosis Procedure	
C1164, C1165 CV SYSTEM	
DTC Logic	
Diagnosis Procedure	.195
C1166, C1167 SV SYSTEM	
DTC Logic Diagnosis Procedure	
C	
C1176 STOP LAMP SW2	
DTC Logic Diagnosis Procedure	
Component Inspection	
U1000 CAN COMM CIRCUIT	203
Description	
DTC Logic Diagnosis Procedure	
5	
U1010 CONTROL UNIT (CAN) Description	
DTC Logic	
Diagnosis Procedure	
POWER SUPPLY AND GROUND CIRCUIT Diagnosis Procedure	
C C C C C C C C C C C C C C C C C C C	
PARKING BRAKE SWITCH Component Function Check	
Diagnosis Procedure	
Component Inspection	

	-
ESP OFF SWITCH210	
Component Function Check	
Diagnosis Procedure	
Component Inspection 211	
ABS WARNING LAMP212	
Component Function Check	
Diagnosis Procedure 212	
BRAKE WARNING LAMP213	
Component Function Check 213	
Diagnosis Procedure	
ESP WARNING LAMP214	
Component Function Check	
Diagnosis Procedure	
ESP OFF INDICATOR LAMP215	
Component Function Check	
Diagnosis Procedure	
-	
SYMPTOM DIAGNOSIS216	
EXCESSIVE OPERATION FREQUENCY216	
Description	
Diagnosis Procedure	
UNEXPECTED BRAKE PEDAL REACTION217	
Description	
Diagnosis Procedure	
THE BRAKING DISTANCE IS LONG	
Description	
Description	
Diagnosis Procedure 219	
Diagnosis Procedure	
Diagnosis Procedure	
Diagnosis Procedure 219 DOES NOT OPERATE 220 Description 220 Diagnosis Procedure 220	
Diagnosis Procedure 219 DOES NOT OPERATE 220 Description 220 Diagnosis Procedure 220 BRAKE PEDAL VIBRATION OR OPERA-	
Diagnosis Procedure 219 DOES NOT OPERATE 220 Description 220 Diagnosis Procedure 220 BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS 221	
Diagnosis Procedure 219 DOES NOT OPERATE 220 Description 220 Diagnosis Procedure 220 BRAKE PEDAL VIBRATION OR OPERA- 221 Description 221	
Diagnosis Procedure 219 DOES NOT OPERATE 220 Description 220 Diagnosis Procedure 220 BRAKE PEDAL VIBRATION OR OPERA- 221 Description 221 Description 221 Diagnosis Procedure 221	
Diagnosis Procedure 219 DOES NOT OPERATE 220 Description 220 Diagnosis Procedure 220 BRAKE PEDAL VIBRATION OR OPERA- 221 Description 221 Description 221 Vehicle Jerks DURING 222	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Diagnosis Procedure221Description221Diagnosis Procedure221Description221Description221Diagnosis Procedure221Description221Description221Description222	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Diagnosis Procedure222Diagnosis Procedure222Description222Description222Description222Description222Description222	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Description222Diagnosis Procedure222NORMAL OPERATING CONDITION223	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Diagnosis Procedure222Diagnosis Procedure222Description222Description222Description222Description222Description222	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Description222Diagnosis Procedure222NORMAL OPERATING CONDITION223	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Diagnosis Procedure222NORMAL OPERATING CONDITION223REMOVAL AND INSTALLATION224	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Diagnosis Procedure222NORMAL OPERATING CONDITION223REMOVAL AND INSTALLATION224WHEEL SENSOR224	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Description222Diagnosis Procedure222NORMAL OPERATING CONDITION223REMOVAL AND INSTALLATION224WHEEL SENSOR224	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Diagnosis Procedure222NORMAL OPERATING CONDITION223REMOVAL AND INSTALLATION224FRONT WHEEL SENSOR224FRONT WHEEL SENSOR :Exploded View224	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Description222Diagnosis Procedure222NORMAL OPERATING CONDITION223REMOVAL AND INSTALLATION224WHEEL SENSOR224FRONT WHEEL SENSOR224	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Diagnosis Procedure222Diagnosis Procedure222Diagnosis Procedure222Diagnosis Procedure222Diagnosis Procedure222NORMAL OPERATING CONDITION223REMOVAL AND INSTALLATION224FRONT WHEEL SENSOR224FRONT WHEEL SENSOR : Exploded View224FRONT WHEEL SENSOR : Removal and Installation224	
Diagnosis Procedure219DOES NOT OPERATE220Description220Diagnosis Procedure220BRAKE PEDAL VIBRATION OR OPERA- TION SOUND OCCURS221Description221Description221Diagnosis Procedure221VEHICLE JERKS DURING222Description222Diagnosis Procedure222NORMAL OPERATING CONDITION223REMOVAL AND INSTALLATION224WHEEL SENSOR224FRONT WHEEL SENSOR224	

REAR WHEEL SENSOR : Removal and Installa- tion	227
SENSOR ROTOR	229
FRONT SENSOR ROTOR FRONT SENSOR ROTOR : Removal and Instal- lation	
REAR SENSOR ROTOR REAR SENSOR ROTOR : Removal and Installa- tion	

ABS ACTUATOR AND ELECTRIC UNIT	
(CONTROL UNIT)	Α
Exploded View230	
Removal and Installation233	
YAW RATE/SIDE/DECEL G SENSOR	В
Exploded View235	
Removal and Installation235	
STEERING ANGLE SENSOR236	С
Removal and Installation236	
ESP OFF SWITCH237	D
Removal and Installation237	

Е

BRC

G

Н

I

J

Κ

L

Μ

Ν

0

Ρ

< PRECAUTION > PRECAUTION PRECAUTIONS

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

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

The vehicle may be equipped with a passenger air bag deactivation switch. Because no rear seat exists where a rear-facing child restraint can be placed, the switch is designed to turn off the passenger air bag so that a rear-facing child restraint can be used in the front passenger seat. The switch is located in the center of the instrument panel, near the ashtray. When the switch is turned to the ON position, the passenger air bag is enabled and could inflate for certain types of collision. When the switch is turned to the OFF position, the passenger air bag is disabled and will not inflate. A passenger air bag OFF indicator on the instrument panel lights up when the passenger air bag is switched OFF. The driver air bag always remains enabled and is not affected by the passenger air bag deactivation switch.

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 "SRS AIR BAG".
- 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.
- The vehicle may be equipped with a passenger air bag deactivation switch which can be operated by the customer. When the passenger air bag is switched OFF, the passenger air bag is disabled and will not inflate. When the passenger air bag is switched ON, the passenger air bag is enabled and could inflate for certain types of collision. After SRS maintenance or repair, make sure the passenger air bag deactivation switch is in the same position (ON or OFF) as when the vehicle arrived for service.

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

WARNING:

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

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:000000006598732

NOTE:

- Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

PRECAUTIONS

OPERATION PROCEDURE

- 1. Connect both battery cables. NOTE: Supply power using jumper cables if battery is discharged.
- 2. Turn the ignition switch to ACC position. (At this time, the steering lock will be released.)
- 3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
- 4. Perform the necessary repair operation.
- 5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock D when the ignition switch is turned to LOCK position.)
- 6. Perform self-diagnosis check of all control units using CONSULT-III.

Precaution for Procedure without Cowl Top Cover

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

Precaution for Brake System

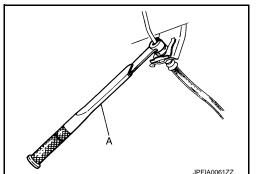
WARNING:

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

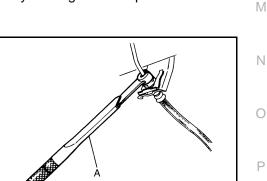
- Brake fluid use refer to <u>MA-13</u>, "Fluids and Lubricants".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with a flare nut torque wrench (A).
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.

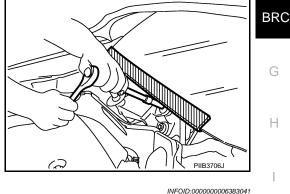
Precaution for Brake Control system

- Always perform a pre-driving check to drive the vehicle.
- Always check speed and safety while driving the vehicle.



INFOID:000000006383042





INFOID:00000006598733

А

В

Κ

L

PRECAUTIONS

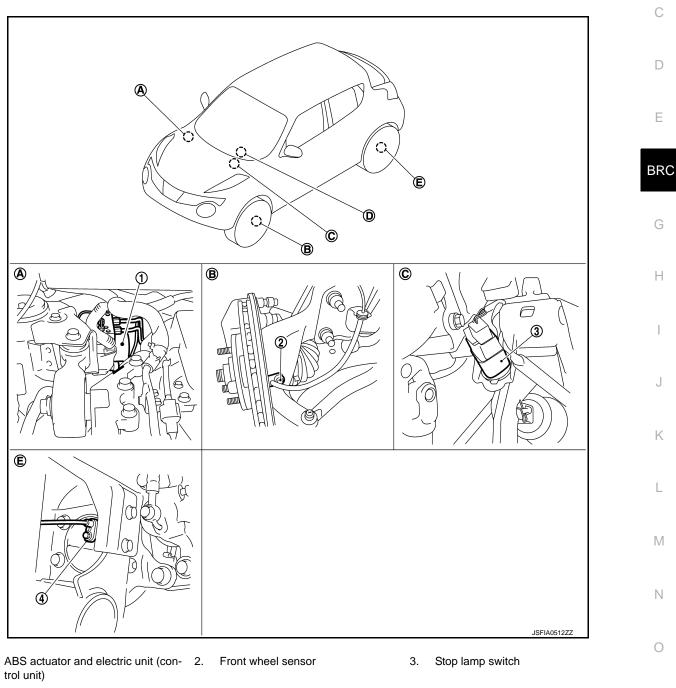
< PRECAUTION >

- To operate CONSULT-III while driving, more than one person is required to be in the vehicle to avoid interference to driving and ensure safety.
- Slight vibrations are felt on the brake pedal and the operation noises occur, when ABS function or EBD function operates. This is not a malfunction because it is caused by ABS function or EBD function that is normally operated.
- When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is normal condition.
- Brake stopping distance may become longer than models without ABS function depending on the road conditions, when ABS function is operated on slippery road like rough road, gravel road or snowy road.
- When a malfunction is indicated, always collect information from the customer about conditions of occurrence, estimate cause and perform operation. Check brake booster operation, brake fluid level and brake fluid leakage, as well as electrical system.
- The optimum performance is achieved by control for ABS function or EBD function when all of brakes, suspensions and tires installed on the vehicle are the specified size and parts. Brake performance and controllability may be negatively affected when other parts than the specified are installed.
- Brake stopping distance may become longer and steering stability may be negatively affected, when tires in different size and combination or other parts than the specified are used.
- When a radio (including wiring), antenna and antenna lead line are located near ABS actuator and electric unit (control unit), a malfunction or improper operation may occur for the control of ABS function or EBD function.
- When the following items are replaced by other parts than genuine parts or modified, ABS warning lamp and brake warning lamp may turn ON, and the control may not operate normally for ABS function or EBD function.
- Suspension component parts (shock absorber, spring, bushing and others)
- Tire and wheel (other than the specified size)
- Brake component parts (brake pad, disc rotor, brake caliper and others)
- Engine component parts (ECM, muffler and others)
- Body reinforcement component parts (rollover bar, tower bar and others)
- When suspension, tire and brake component parts are excessively worn or deteriorated and the vehicle is driven, ABS warning lamp and brake warning lamp may turn ON, and the control may not operate normally for ABS function or EBD function.
- ABS warning lamp and brake warning lamp may turn ON, when only front wheel or rear wheel is rotated using a free roller. This is not a malfunction, because it is caused by wheel speed difference between wheel that is rotated and wheel that is not rotated. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory.
- When power supply voltage is not normal, ABS warning lamp and brake warning lamp turn ON. ABS actuator and electric unit (control unit) stops control for ABS function or EBD function. Ordinary brake operates. After power supply returns to normal, ABS warning lamp and brake warning lamp turn OFF. The control becomes operative for ABS function or EBD function.

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION COMPONENT PARTS

LHD



- 4. Rear wheel sensor
- A. Inside engine room
- B. Steering knuckle

Ε.

bly

- C. Brake pedal

- D. ABS warning lamp, brake warning lamp (in combination meter)
- RHD

1.

Rear wheel hub and bearing assem-

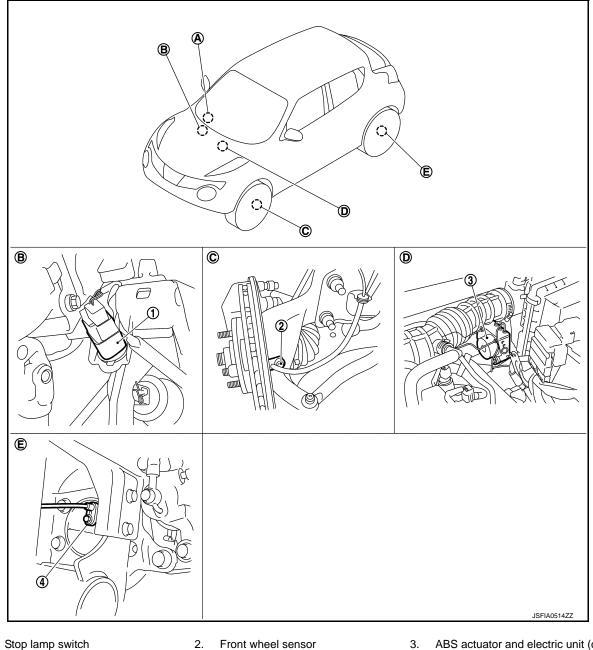
INFOID:000000006383046

А

В

Ρ

< SYSTEM DESCRIPTION >



- 1.
- 4. Rear wheel sensor
- ABS warning lamp, brake warning Α. lamp (in combination meter)
- Inside engine room D.

- Front wheel sensor
- Brake pedal В.
- Rear wheel hub and bearing assem-Ε. bly
- **Component Description**

- 3. ABS actuator and electric unit (control unit)
- C. Steering knuckle

INFOID:000000006383047

Component	Reference/Function
ABS actuator and electric unit (control unit)	BRC-11, "ABS Actuator and Electric Unit (Control Unit)"
Wheel sensor	BRC-11, "Wheel Sensor and Sensor Rotor"
Stop lamp switch	BRC-12, "Stop Lamp Switch"

< SYSTEM DESCRIPTION >

[WITHOUT ESP]

INFOID:000000006383048

В

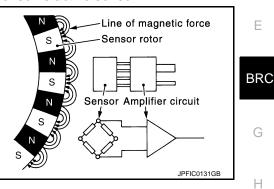
D

Component	Reference/Function	
ABS warning lamp	BRC-13. "System Description"	A
Brake warning lamp	Dice-13, System Description	_

Wheel Sensor and Sensor Rotor

NOTE:

- Wheel sensor of front wheel is installed on steering knuckle.
- Sensor rotor of front wheel is integrated in wheel hub and bearing assembly.
- Wheel sensor of rear wheel is installed on wheel hub and bearing assembly.
- Sensor rotor of rear wheel is integrated in wheel hub and bearing assembly.
- ٠
- 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.



ABS Actuator and Electric Unit (Control Unit)

INFOID:000000006383049

function.	
 ELECTRIC UNIT (CONTROL UNIT) Brake fluid pressure are controlled according to signals from each sensor. If malfunction is detected, the system enters fail-safe mode. 	J
ACTUATOR The following components are integrated with ABS actuator.	K
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).	L
Motor Relay Operates the motor ON/OFF according to signals from ABS actuator and electric unit (control unit).	M
Actuator Relay (Main Relay) Operates each valve ON/OFF according to signals from ABS actuator and electric unit (control unit).	N
ABS IN Valve Switches the fluid pressure line to increase or hold according to signals from control unit. NOTE: Valve is a solenoid valve.	0
ABS OUT Valve Switches the fluid pressure line to increase, hold or decrease according to signals from control unit. NOTE: Valve is a solenoid valve.	Ρ
Inlet Valve Brake fluid sucked from the reservoir by the pump does not backflow. NOTE: Valve is a check valve	

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

Valve is a check valve.

< SYSTEM DESCRIPTION >

Outlet Valve

Brake fluid discharged from the pump does not backflow. **NOTE:** Valve is a check valve.

Return Check Valve

Returns the brake fluid from brake caliper 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.

Stop Lamp Switch

INFOID:000000006383050

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

< SYSTEM DESCRIPTION >

SYSTEM

System Description

INFOID:000000006383051

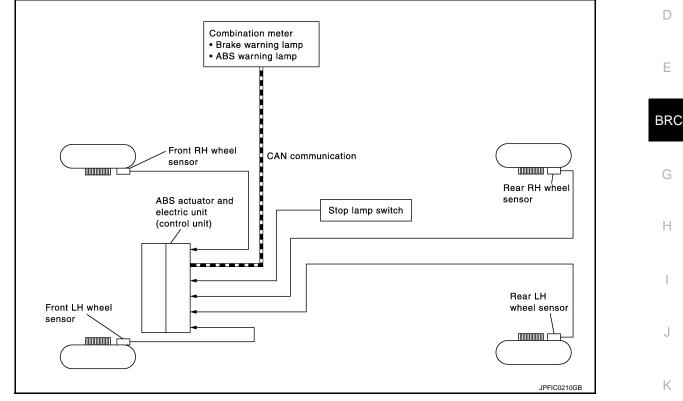
А

В

С

- The system switches fluid pressure of each brake caliper to increase, to hold or to decrease according to signals from control unit in ABS actuator and electric unit (control unit). This control system is applied to ABS function and EBD function.
- Fail-safe function is available for each function and is activated by each function when system malfunction occurs.

SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

ABS function, EBD function

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

VALVE OPERATION

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

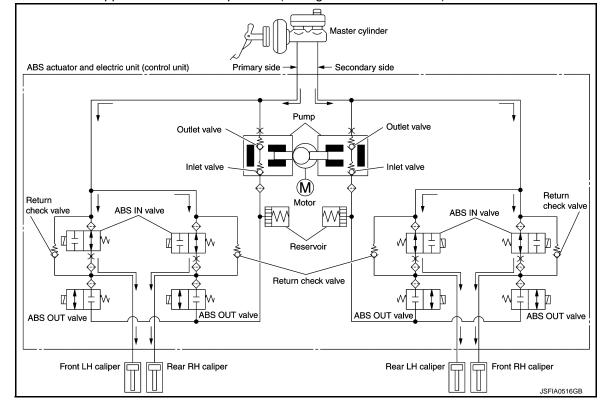
0

L

< SYSTEM DESCRIPTION >

[WITHOUT ESP]

When Brake Pedal is Applied or ABS is in Operation (During Pressure Increases)



Name	Not activated	During pressure increases	
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 (fluid pressure)	_	Pressure increases	

During pressure front RH brake caliper increases

• When 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.

During pressure front LH brake caliper increases

• When 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.

During pressure rear RH brake caliper increases

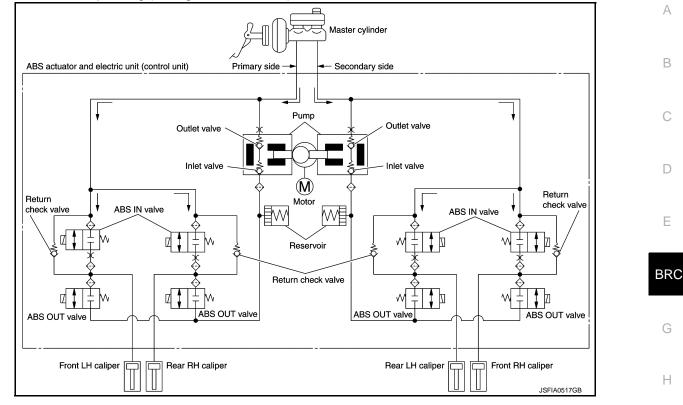
• When the ABS IN valve opens, brake fluid is supplied to the rear RH brake caliper from the master cylinder through the ABS IN valve. Brake fluid does not flow into the reservoir because the ABS OUT valve is closed.

During pressure rear LH brake caliper increases

• When the ABS IN valve opens, brake fluid is supplied to the rear 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.

< SYSTEM DESCRIPTION >

When ABS is Starts Operating (During Pressure Holds)



Name	Not activated	During pressure holds	•
ABS IN valve	Power supply is not supplied (open)	Power supply is supplied (close)	-
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)	-
Each brake caliper (fluid pressure)	_	Pressure holds	_

During pressure front RH brake caliper holds

Κ 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.

During pressure front LH brake caliper holds

· 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.

During pressure rear RH brake caliper holds

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

During pressure rear LH brake caliper holds

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

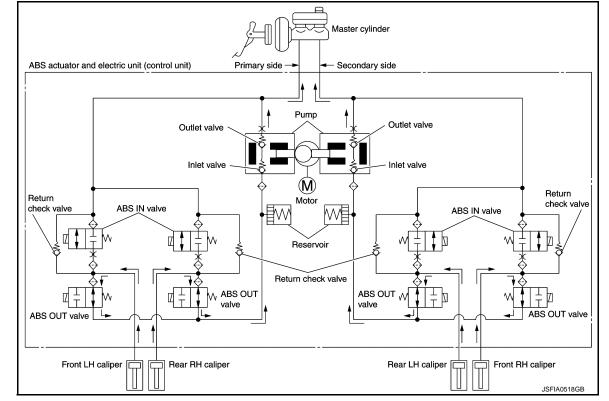
Ν

L

[WITHOUT ESP]

< SYSTEM DESCRIPTION >

When ABS is in Operation (During Pressure Decreases)



Name	Not activated	During pressure decreases	
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 (fluid pressure)	_	Pressure decreases	

During pressure front RH brake caliper decreases

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

During pressure front LH brake caliper decreases

 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.

During pressure rear RH brake caliper decreases

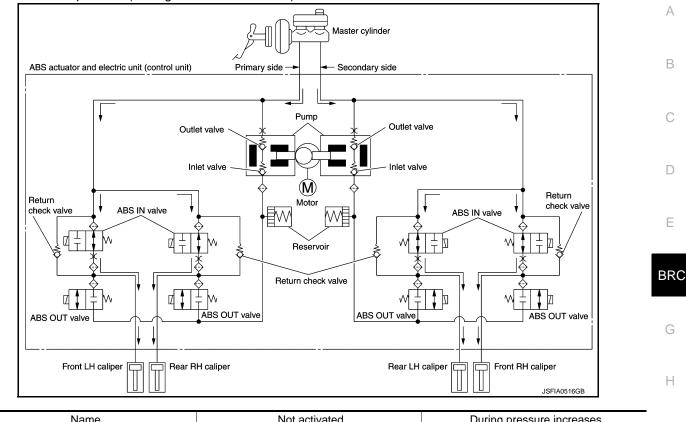
 Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the rear RH brake caliper is supplied to the reservoir through the ABS OUT valve. This fluid pressure decreases when sent to the master cylinder by the pump.

During pressure rear LH brake caliper decreases

 Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the rear 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.

< SYSTEM DESCRIPTION >

When ABS is in Operation (During Pressure Increases)



Name	Not activated	During pressure increases	
ABS IN valve	Power supply is not supplied (open) Power supply is not supplied		
ABS OUT valve	Power supply is not supplied (close) Power supply is not supplied		
Each brake caliper (fluid pressure)		Pressure increases	

During pressure front RH brake caliper increases

 Brake fluid is supplied to the front RH brake caliper from the master cylinder through the ABS IN valve. Since the ABS OUT valve is closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to the front RH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

During pressure front LH brake caliper increases

 Brake fluid is supplied to the front LH brake caliper from the master cylinder through the ABS IN valve. Since the ABS OUT valve is closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to the front LH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

During pressure rear RH brake caliper increases

 Brake fluid is supplied to the rear RH brake caliper from the master cylinder through the ABS IN valve. Since the ABS OUT valve is closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to the rear RH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

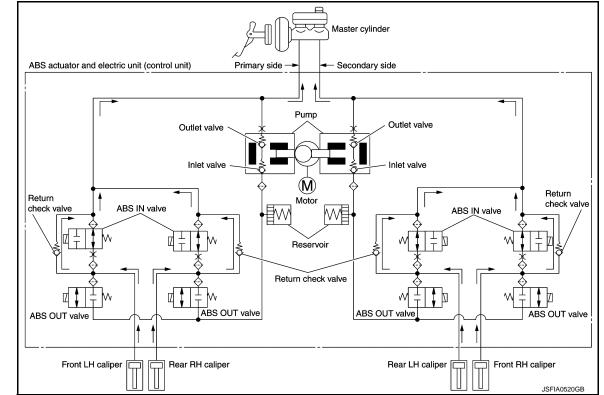
During pressure rear LH brake caliper increases

Brake fluid is supplied to the rear LH brake caliper from the master cylinder through the ABS IN valve. Since
the ABS OUT valve is closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to
the rear LH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not
energized (time that the ABS IN valve is open).

Ν

< SYSTEM DESCRIPTION >

When Brake Release



Name	Not activated	During brake release
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 (fluid pressure)	_	Pressure decreases

During front RH brake caliper release

• Brake fluid is supplied to the front RH brake caliper through the return check valve of the ABS IN valve and returns to the master cylinder.

During front LH brake caliper release

• Brake fluid is supplied to the front LH brake caliper through the return check valve of the ABS IN valve and returns to the master cylinder.

During rear RH brake caliper release

• Brake fluid is supplied to the rear RH brake caliper through the return check valve of the ABS IN valve and returns to the master cylinder.

During rear LH brake caliper release

• Brake fluid is supplied to the rear LH brake caliper through the return check valve of the ABS IN valve and returns to the master cylinder.

Component Parts and Function

Component	Function
Pump	Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.
Motor	Drives the pump according to signals from control unit.
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit.
ABS OUT valve	Switches the fluid pressure line to increase, hold or decrease according to signals from control unit.
Inlet valve	Brake fluid sucked from the reservoir by the pump does not backflow.
Outlet valve	Brake fluid discharged from the pump does not backflow.

< SYSTEM DESCRIPTION >

Component	Function	^
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.	A
Reservoir	Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper and wheel cylinder.	В

CONDITION FOR TURN ON THE WARNING LAMP

ABS Warning Lamp

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

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

Brake Warning Lamp

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

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

Fail-safe

INFOID:000000006598764

ABS FUNCTION

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

NOTE:

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

EBD FUNCTION

ABS warning lamp 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 function and EBD function. The vehicle status becomes the same as models without ABS function and EBD function.

BRC-19

[WITHOUT ESP]

G

Μ

Ν

P

< SYSTEM DESCRIPTION >

[WITHOUT ESP]

DTC	Malfunction detected condition	Fail-safe condition
C1101	When an open circuit is detected in rear RH wheel sensor circuit.	
C1102	When an open circuit is detected in rear LH wheel sensor circuit.	
C1103	When an open circuit is detected in front RH wheel sensor circuit.	
C1104	When an open circuit is detected in front LH wheel sensor circuit.	
C1105	 When 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: 7.5 V ≥ Rear RH wheel sensor power supply voltage Rear RH wheel sensor power supply voltage: 16 V ≤ 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. 	The following functions are sus- pended. • ABS function • EBD function (only when both 2 rear wheels are malfunctioning
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: 7.5 V ≥ Rear LH wheel sensor power supply voltage Rear LH wheel sensor power supply voltage: 16 V ≤ 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: 7.5 V ≥ Front RH wheel sensor power supply voltage Front RH wheel sensor power supply voltage: 16 V ≤ 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: 7.5 V ≥ Front LH wheel sensor power supply voltage Front LH wheel sensor power supply voltage: 16 V ≤ 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. 	

< SYSTEM DESCRIPTION >

[WITHOUT ESP]

DTC	Malfunction detected condition	Fail-safe condition
C1109	 When ignition power supply voltage is in following state. Ignition power supply voltage: 10 V ≥ Ignition power supply voltage. Ignition power supply voltage: 16 V ≤ Ignition power supply voltage. 	
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.	
C1115	When difference in wheel speed between any wheel and others is detected the vehicle is driven, because of installation of other tires than specified.	
C1120	When a malfunction is detected in front LH ABS IN valve.	The following functions are sus- pended.
C1121	When a malfunction is detected in front LH ABS OUT valve.	ABS function
C1122	When a malfunction is detected in front RH ABS IN valve.	EBD function
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.	
C1140	When a malfunction is detected in actuator relay.	
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).	

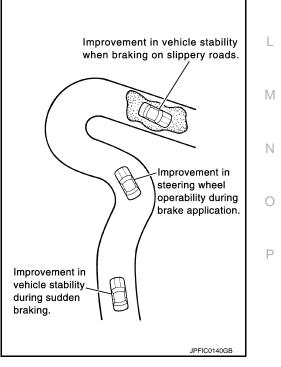
ABS FUNCTION

ABS FUNCTION : System Description

- By preventing wheel lock through brake force (brake fluid pressure) control that is electronically controlled by detecting wheel speed during braking, stability during emergency braking is improved so that obstacles can be easily bypassed by steering operation.
- During braking, control units calculates wheel speed and pseudo-vehicle speed, and transmits pressure increase, hold or decrease signals to actuator portion according to wheel slip status.
- The following effects are obtained by preventing wheel lock during braking.
- Vehicle tail slip is prevented during braking when driving straight.
- Understeer and oversteer tendencies are moderated during braking driving on a corner.
- Obstacles may be easily bypassed by steering operation during braking.
- CONSULT-III can be used to diagnose the system diagnosis.
- · Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for ABS function. The vehicle status becomes the same as models without ABS function. However, EBD function is operated normally. Refer to BRC-19, "Failsafe".

NOTE:

- ABS has the characteristic as described here, but it is not the device that helps reckless driving.
- To stop vehicle efficiently, ABS does not operate and ordinary brake operates at low speed [approx. 5 to 10 km/h (3.1 to 6.2 MPH) or less, but differs subject to road conditions).
- · Self-diagnosis is performed immediately after when engine starts and when vehicle initially is driven [by vehicle speed approx. 15 km/h (9.3 MPH)]. Motor sounds are generated during self-diagnosis. In addition, brake pedal may be felt heavy when depressing brake pedal lightly. These symptoms are not malfunctions.

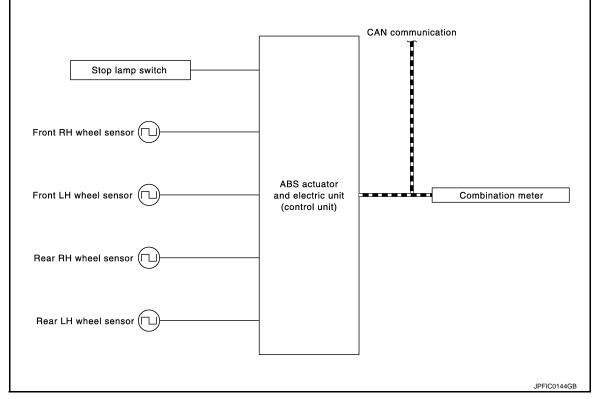


INFOID:00000006383053

Κ

< SYSTEM DESCRIPTION >

SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

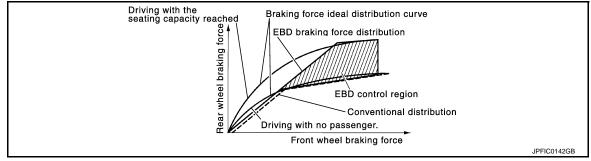
Component	Signal description	
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.ABS warning lamp signal	

EBD FUNCTION

EBD FUNCTION : System Description

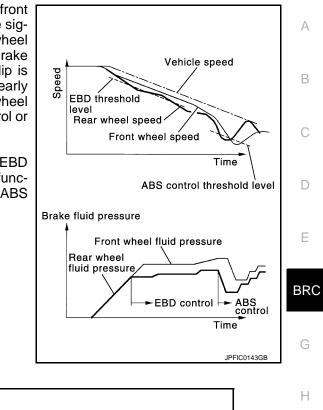
INFOID:000000006383054

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



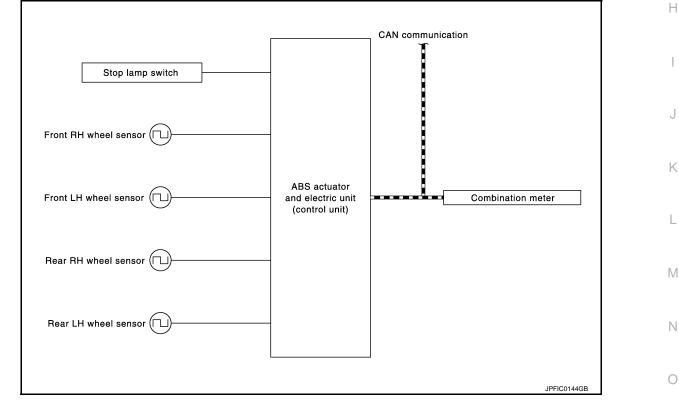
< SYSTEM DESCRIPTION >

- During braking, control unit portion compares slight slip on front and rear wheels by wheel speed sensor signal, transmits drive signal to actuator portion when rear wheel slip exceeds front wheel slip for the specified value or more, and controls rear wheel brake force (brake fluid pressure) so that increase of rear wheel slip is prevented and slips on front wheel and rear wheel are nearly equalized. ABS control is applied when slip on each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT-III can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for ABS function and EBD function. The vehicle status becomes the same as models without ABS function and EBD function. Refer to <u>BRC-19</u>, "Fail-safe".



Ρ

SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

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

EM

[WITHOUT ESP]

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

< SYSTEM DESCRIPTION >

[WITHOUT ESP]

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

CONSULT-III Function

INFOID:000000006383055

APPLICATION ITEMS

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

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

*: The following diagnosis information is erased by erasing.

• DTC

• Freeze frame data (FFD)

ECU IDENTIFICATION

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

SELF DIAGNOSTIC RESULT Refer to <u>BRC-31, "DTC Index"</u>.

When "CRNT" is displayed on self-diagnosis result

The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result

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

Freeze frame data (FFD)

When DTC is detected, a vehicle state shown below is recorded and displayed on CONSULT-III.

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

DATA MONITOR

×: Applicable

Item (Unit)	Monitor item	Monitor item selection Note	
nem (Onit)	ECU INPUT SIGNALS	MAIN SIGNALS	- Note
FR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front LH wheel sensor is displayed.
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front RH wheel sensor is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear LH wheel sensor is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear RH wheel sensor is displayed.
FR RH IN SOL (On/Off)		×	Operation status of front RH wheel ABS IN valve is displayed.

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

< SYSTEM DESCRIPTION >

[WITHOUT ESP]

Ρ

them (I limit)	Monitor item selection		Nata	
Item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	– Note	
FR RH OUT SOL (On/Off)		×	Operation status of front RH wheel ABS OUT valve is displayed.	
FR LH IN SOL (On/Off)		×	Operation status of front LH wheel ABS IN valve is displayed.	
FR LH OUT SOL (On/Off)		×	Operation status of front LH wheel ABS OUT valve is displayed.	
RR RH IN SOL (On/Off)		×	Operation status of rear RH wheel ABS IN valve is displayed	
RR RH OUT SOL (On/Off)		×	Operation status of rear RH wheel ABS OUT valve is displayed.	
RR LH IN SOL (On/Off)		×	Operation status of rear LH wheel ABS IN valve is displayed.	
RR LH OUT SOL (On/Off)		×	Operation status of rear LH wheel ABS OUT valve is displayed.	
EBD WARN LAMP (On/Off)			Brake warning lamp ON/OFF status is displayed. *	
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal input status is displayed.	
MOTOR RELAY (On/Off)		×	ABS motor and motor relay status is displayed.	
ACTUATOR RLY (On/Off)		×	ABS actuator relay status is displayed.	
ABS WARN LAMP (On/Off)		×	ABS warning lamp ON/OFF status is displayed. *	
BATTERY VOLT (V)	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.	
EBD SIGNAL (On/Off)			EBD operation status is displayed.	
ABS SIGNAL (On/Off)			ABS operation status is displayed.	
EBD FAIL SIG (On/Off)			EBD fail-safe signal status is displayed.	
ABS FAIL SIG (On/Off)			EBD fail-safe signal status is displayed.	
CRANKING SIG (On/Off)			Cranking status is displayed.	

*: Refer to <u>BRC-13</u>, "System Description" for ON/OFF conditions of each warning lamp.

ACTIVE TEST

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

CAUTION:

- Never perform ACTIVE TEST while driving the vehicle.
- Always bleed air from brake system before ACTIVE TEST.
- Never perform ACTIVE TEST when system is malfunctioning. NOTE:
- When active test is performed while depressing the pedal, the pedal depressing stroke may change. This is not a malfunction.
- "TEST IS STOPPED" is displayed approx. 10 seconds after operation start.
- When performing active test again after "TEST IS STOPPED" is displayed, select "BACK".
- ABS warning lamp and brake warning lamp may turn ON during active test. This is not a malfunction.

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

< SYSTEM DESCRIPTION >

[WITHOUT ESP]

ABS IN Valve and ABS OUT Valve

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

Test item	Display item	Display		
Test tierri		Up	Кеер	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR RH SOL	FR RH OUT SOL	Off	Off	On*
	FRLH IN SOL	Off	On	On
FR LH SOL	FR LH OUT SOL	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
	RR RH OUT SOL	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
	RR LH OUT SOL	Off	Off	On*

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

ABS Motor

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

Test item	Display item	Display	
restitem	Display item	On	Off
ABS MOTOR	MOTOR RELAY	On	Off
ABS MOTOR	ACTUATOR RLY	On	On

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000006548681 B

CONSULT-III DATA MONITOR STANDARD VALUE

Monitor item	Condition	Reference values in normal operation
	Vehicle stopped	0.00 km/h (MPH)
FR LH SENSOR	When driving straight ahead ^{*1}	Nearly matches the speedometer display (within ±10%)
	Vehicle stopped	0.00 km/h (MPH)
FR RH SENSOR	When driving straight ahead ^{*1}	Nearly matches the speedometer display (within ±10%)
	Vehicle stopped	0.00 km/h (MPH)
RR LH SENSOR	When driving straight ahead ^{*1}	Nearly matches the speedometer display (within ±10%)
	Vehicle stopped	0.00 km/h (MPH)
RR RH SENSOR	When driving straight ahead ^{*1}	Nearly matches the speedometer display (within ±10%)
	Active	On
FR RH IN SOL ^{*2}	Not activated	Off
FR RH OUT SOL ^{*2}	Active	On
	Not activated	Off
FR LH IN SOL ^{*2}	Active	On
	Not activated	Off
FR LH OUT SOL ^{*2}	Active	On
	Not activated	Off
RR RH IN SOL ^{*2}	Active	On
	Not activated	Off
RR RH OUT SOL ^{*2}	Active	On
	Not activated	Off
RR LH IN SOL ^{*2}	Active	On
	Not activated	Off
RR LH OUT SOL ^{*2}	Active	On
	Not activated	Off
EBD WARN LAMP	When brake warning lamp is ON^{*3}	On
	When brake warning lamp is OFF ^{*3}	Off
	Brake pedal depressed	On
STOP LAMP SW	Brake pedal not depressed	Off
MOTOR RELAY	Active	On
	Not activated	Off
ACTUATOR RLY	Active	On
	Not activated (in fail-safe mode)	Off
	When ABS warning lamp is ON ^{*3}	On
ABS WARN LAMP	When brake warning lamp is OFF ^{*3}	Off
BATTERY VOLT	Ignition switch ON	10 – 16 V

[WITHOUT ESP]

А

< ECU DIAGNOSIS INFORMATION >

[ŴITHOUT ESP]

Monitor item	Condition	Reference values in normal operation
EBD SIGNAL	EBD is activated	On
EDD SIGNAL	EBD is not activated	Off
ABS SIGNAL	ABS is activated	On
ABS SIGNAL	ABS is not activated	Off
EBD FAIL SIG	In EBD fail-safe	On
EDD FAIL SIG	EBD is normal	Off
ABS FAIL SIG	In ABS fail-safe	On
ABS FAIL SIG	ABS is normal	Off
CRANKING SIG	At cranking	On
CRAINING SIG	Other than at cranking	Off

*1: Confirm tire pressure is standard value.

*2: Refer to "valve operation" in BRC-13, "System Description" for valve operation of each valve.

*3: Refer to <u>BRC-13</u>, "System Description" for ON/OFF conditions of each warning lamp and indicator lamp.

Fail-safe

INFOID:000000006548682

ABS FUNCTION

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

NOTE:

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

EBD FUNCTION

ABS warning lamp 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 function and EBD function. The vehicle status becomes the same as models without ABS function and EBD function.

< ECU DIAGNOSIS INFORMATION >

[WITHOUT ESP]

DTC	Malfunction detected condition	Fail-safe condition
C1101	When an open circuit is detected in rear RH wheel sensor circuit.	
C1102	When an open circuit is detected in rear LH wheel sensor circuit.	
C1103	When an open circuit is detected in front RH wheel sensor circuit.	
C1104	When an open circuit is detected in front LH wheel sensor circuit.	
C1105	 When 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: 7.5 V ≥ Rear RH wheel sensor power supply voltage Rear RH wheel sensor power supply voltage: 16 V ≤ 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: 7.5 V ≥ Rear LH wheel sensor power supply voltage Rear LH wheel sensor power supply voltage: 16 V ≤ 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. 	 The following functions are suspended. ABS function EBD function (only when both 2 rear wheels are malfunctioning)
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: 7.5 V ≥ Front RH wheel sensor power supply voltage Front RH wheel sensor power supply voltage: 16 V ≤ 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: 7.5 V ≥ Front LH wheel sensor power supply voltage Front LH wheel sensor power supply voltage: 16 V ≤ 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. 	

0

Ρ

< ECU DIAGNOSIS INFORMATION >

200 21		
DTC	Malfunction detected condition	Fail-safe condition
C1109	 When ignition power supply voltage is in following state. Ignition power supply voltage: 10 V ≥ Ignition power supply voltage. Ignition power supply voltage: 16 V ≤ Ignition power supply voltage. 	
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.	
C1115	When difference in wheel speed between any wheel and others is detected the vehicle is driven, because of installation of other tires than specified.	
C1120	When a malfunction is detected in front LH ABS IN valve.	The following functions are sus- pended.
C1121	When a malfunction is detected in front LH ABS OUT valve.	ABS function
C1122	When a malfunction is detected in front RH ABS IN valve.	EBD function
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.	1
C1127	When a malfunction is detected in rear RH ABS OUT valve.	1

DTC Inspection Priority Chart

and electric unit (control unit).

seconds or more.

When a malfunction is detected in actuator relay.

C1140

U1000

U1010

INFOID:000000006548683

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

When CAN communication signal is not continuously transmitted or received for 2

When detecting error during the initial diagnosis of CAN controller of ABS actuator

Priority	Detected item (DTC)
1	U1000 CAN COMM CIRCUIT U1010 CONTROL UNIT (CAN)
2	C1110 CONTROLLER FAILURE
3	C1109 BATTERY VOLTAGE [ABNORMAL] C1111 PUMP MOTOR C1140 ACTUATOR RLY
4	 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 C1125 RR LH OUT ABS SOL C1126 RR RH IN ABS SOL C1126 RR RH IN ABS SOL C1127 RR RH OUT ABS SOL C1127 RR RH OUT ABS SOL

[WITHOUT ESP]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [WITHOUT ESP]

< ECU DIAGNOSIS INFORMATION >

DTC Index

INFOID:000000006548684

А

	Refer to	Display Item	DTC
В		RR RH SENSOR-1	C1101
		RR LH SENSOR-1	C1102
0	BRC-36, "DTC Logic"	FR RH SENSOR-1	C1103
С		FR LH SENSOR-1	C1104
		RR RH SENSOR-2	C1105
D		RR LH SENSOR-2	C1106
	BRC-39, "DTC Logic"	FR RH SENSOR-2	C1107
_		FR LH SENSOR-2	C1108
E	BRC-45, "DTC Logic"	BATTERY VOLTAGE [ABNORMAL]	C1109
	BRC-47, "DTC Logic"	CONTROLLER FAILURE	C1110
BRC	BRC-48, "DTC Logic"	PUMP MOTOR	C1111
	BRC-50, "DTC Logic"	ABS SENSOR [ABNORMAL SIGNAL]	C1115
	BRC-56, "DTC Logic"	FR LH IN ABS SOL	C1120
G	BRC-58, "DTC Logic"	FR LH OUT ABS SOL	C1121
	BRC-56, "DTC Logic"	FR RH IN ABS SOL	C1122
Н	BRC-58, "DTC Logic"	FR RH OUT ABS SOL	C1123
	BRC-56, "DTC Logic"	RR LH IN ABS SOL	C1124
	BRC-58, "DTC Logic"	RR LH OUT ABS SOL	C1125
	BRC-56, "DTC Logic"	RR RH IN ABS SOL	C1126
	BRC-58, "DTC Logic"	RR RH OUT ABS SOL	C1127
	BRC-60, "DTC Logic"	ACTUATOR RLY	C1140
J	BRC-62, "DTC Logic"	CAN COMM CIRCUIT	U1000
	BRC-63, "DTC Logic"	CONTROL UNIT (CAN)	U1010

- L
- Μ
- Ν
- Ο

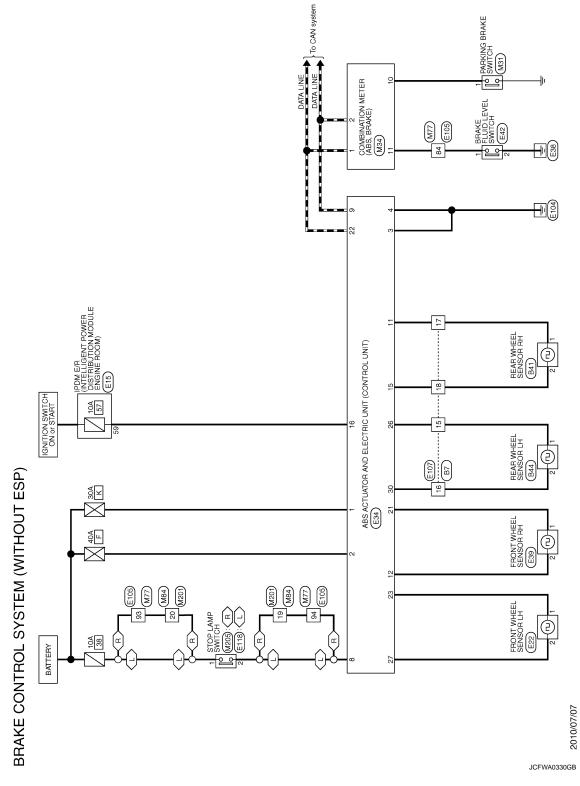
Ρ

WIRING DIAGRAM BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:000000006383060

For connector terminal arrangements, harness layout, and alphabets in a \bigcirc (option abbreviation; if not described in wiring diagram), refer to <u>GI-12, "Connector Information/Explanation of Option Abbreviation"</u>.



< BASIC INSPECTION >	[WITHOUT ESP]
BASIC INSPECTION	
DIAGNOSIS AND REPAIR W	ORK FLOW
Work Flow	INFOID:00000006600948
DETAILED FLOW	
1. INTERVIEW FROM THE CUSTOMER	
	ion. First of all, perform an interview utilizing <u>BRC-34</u> , "Diagnostic s well as fully understand it. Ask customer about his/her complaints e with customer, if necessary.
Customers are not professional. Never maybe the customer mentions this sym	guess easily like "maybe the customer means that," or " ptom".
>> GO TO 2.	
2. СНЕСК ЅҮМРТОМ	
obtained by interview. Also check that the <u>safe</u> ".	I by the customer, based on the information from the customer symptom is not caused by fail-safe mode. Refer to <u>BRC-19, "Fail-</u>
	al operation, fully inspect each portion and obtain the under-
standing of customer that the symptom	is not caused by a malfunction.
standing of customer that the symptom	is not caused by a malfunction.
>> GO TO 3.	is not caused by a malfunction.
>> GO TO 3. 3.PERFORM THE SELF-DIAGNOSIS	is not caused by a malfunction.
>> GO TO 3. 3.PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS".	is not caused by a malfunction.
>> GO TO 3. 3.PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS".	
>> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". <u>Is DTC detected?</u> YES >> Record or print self-diagnosis NO >> GO TO 6.	
>> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". <u>Is DTC detected?</u> YES >> Record or print self-diagnosis NO >> GO TO 6.	
>> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". <u>Is DTC detected?</u> YES >> Record or print self-diagnosis NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III.	results and GO TO 4.
 >> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS" 2. Perform DTC confirmation procedures 	results and GO TO 4.
 >> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS" 2. Perform DTC confirmation procedures NOTE: If some DTCs are detected at the som 	results and GO TO 4.
 >> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS" 2. Perform DTC confirmation procedures NOTE: If some DTCs are detected at the som BRC-30, "DTC Inspection Priority Cha Is any DTC detected? 	results and GO TO 4. for the error-detected system. e time, determine the order for performing the diagnosis based on
 >> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS" 2. Perform DTC confirmation procedures NOTE: If some DTCs are detected at the som BRC-30, "DTC Inspection Priority Cha Is any DTC detected? YES >> GO TO 5. 	results and GO TO 4. for the error-detected system. e time, determine the order for performing the diagnosis based on
 >> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS" 2. Perform DTC confirmation procedures NOTE: If some DTCs are detected at the som BRC-30, "DTC Inspection Priority Cha Is any DTC detected? YES >> GO TO 5. NO >> Check harness and connector "Intermittent Incident". 	results and GO TO 4. for the error-detected system. e time, determine the order for performing the diagnosis based on <u>t</u> " [ABS actuator and electric unit (control unit)]. s based on the information obtained by interview. Refer to <u>GI-42</u> ,
 3.PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". IS DTC detected? YES >> Record or print self-diagnosis NO >> GO TO 6. 4.RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS" 2. Perform DTC confirmation procedures NOTE: If some DTCs are detected at the som BRC-30, "DTC Inspection Priority Cha Is any DTC detected? YES >> GO TO 5. NO >> Check harness and connector 	results and GO TO 4. for the error-detected system. e time, determine the order for performing the diagnosis based on <u>t</u> " [ABS actuator and electric unit (control unit)]. s based on the information obtained by interview. Refer to <u>GI-42</u> , <u>CTED PART</u> ng or replacing.
 >> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS" 2. Perform DTC confirmation procedures NOTE: If some DTCs are detected at the som BRC-30, "DTC Inspection Priority Charles and Connector "Intermittent Incident". 5. REPAIR OR REPLACE ERROR-DETER Repair or replace error-detected parts. Reconnect part or connector after repairies 	results and GO TO 4. for the error-detected system. e time, determine the order for performing the diagnosis based on <u>t</u> " [ABS actuator and electric unit (control unit)]. s based on the information obtained by interview. Refer to <u>GI-42</u> , <u>CTED PART</u> ng or replacing.

Estimate error-detected system based on symptom diagnosis and perform inspection. Can the error-detected system be identified?

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITHOUT ESP]

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to <u>GI-42</u>, <u>"Intermittent Incident"</u>.

7.FINAL CHECK

With CONSULT-III.

- 1. Check the reference value for "ABS".
- 2. Recheck the symptom and check that the symptom is not reproduced on the same conditions.

Is the symptom reproduced?

YES >> GO TO 3.

NO >> INSPECTION END

Diagnostic Work Sheet

INFOID:000000006600949

Description

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

INTERVIEW SHEET SAMPLE

			Interviev	w sheet						
Customer name	MR/MS	Registration number					al year stration			
name		Vehicle type				VIN				
Storage date	Engine				Mile	age	km	I (Mile)	
		Does not op	perate () fu	Inction
		Warning lar	np for () turr	ns ON.
Symptom		□ Noise					Vibration			
		□ Other ()
First occurren	се	□ Recently	□ Oth	ner ()
Frequency of occurrence		□ Always	🗆 Uno	der a certai	n condi	tions of	□ Sor	netimes (time(s	s)/day)
		□ Irrelevant								
Climate con-	Weather	□ Fine □	I Cloud	🗆 Ra	in	□Snow	□ Otł	ners ()
ditions Temperature		□ Hot □W	/arm	Cool	ΠC	old l	Tempera	ature [Approx.	°C (°F)]
Relative humidity		🗆 High		Moderate		Lo'	w			
Road conditions		□ Urban area □ Mountainou		Suburb (uphill or do			□ Highwa □ Rough	•		
Operating condition, etc.		Irrelevant When engin During drivi During deca During corn When steer	ng eleratior nering (ri	During n ight curve d	or left cu	ration urve)		onstant speed	driving	

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITHOUT ESP]

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Logic

INFOID:000000006600950

[WITHOUT ESP]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III.

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

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

YES >> Proceed to <u>BRC-36</u>, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Never check between wheel sensor harness connector terminals.

1.CHECK WHEEL SENSOR

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

Is the inspection result normal?

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

2.REPLACE WHEEL SENSOR (1)

()With CONSULT-III.

- 1. Replace wheel sensor.
- Front: Refer to BRC-84, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to <u>BRC-86</u>, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase Self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Stat the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.

BRC-36

INFOID:000000006600951

C1101, C1102, C1103, C1104 WHEEL SENSOR

C1101, C1102, C1103, C1104 WHEEL SENSOR	
< DTC/CIRCUIT DIAGNOSIS >	[WITHOUT ESP]
7. Perform self-diagnosis for "ABS".	
Is DTC "C1101", "C1102", "C1103" or "C1104" detected?	
YES >> GO TO 3. NO >> INSPECTION END	
3. CHECK CONNECTOR	
1. Turn the ignition switch OFF.	
2. Check ABS actuator and electric unit (control unit) harness connector for disconnec	tion or looseness.
3. Check wheel sensor harness connector for disconnection or looseness.	
<u>Is the inspection result normal?</u> YES >> GO TO 5.	
NO >> Repair or replace error-detected parts, securely lock the connector, and GO) TO 4.
4.PERFORM SELF-DIAGNOSIS (1)	
(P)With CONSULT-III.	
1. Erase Self-diagnosis result for "ABS".	
 Turn the ignition switch OFF, and wait 10 seconds or more. Stat the engine. 	
 Otat the engine. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. 	
5. Stop the vehicle.	
 Perform self-diagnosis for "ABS". <u>Is DTC "C1101", "C1102", "C1103" or "C1104" detected?</u> 	
YES $>>$ GO TO 5.	
NO >> INSPECTION END	
5. CHECK TERMINAL	
1. Turn the ignition switch OFF.	
 Disconnect ABS actuator and electric unit (control unit) harness connector and the and electric unit (control unit) pin terminals for damage or loose connection with har 	
3. Disconnect wheel sensor harness connector and check each wheel sensor pin ter	
loose connection with harness connector.	
<u>Is the inspection result normal?</u> YES >> GO TO 7.	
NO >> Repair or replace error-detected parts and GO TO 6.	
6. PERFORM SELF-DIAGNOSIS (2)	
(P)With CONSULT-III.	
1. Connect ABS actuator and electric unit (control unit) harness connector.	
 Connect wheel sensor harness connector. Erase Self-diagnosis result for "ABS". 	
4. Turn the ignition switch OFF, and wait 10 seconds or more.	
5. Stat the engine.	
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. 	
8. Perform self-diagnosis for "ABS".	
Is DTC "C1101", "C1102", "C1103" or "C1104" detected?	
YES >> GO TO 7. NO >> INSPECTION END	
7.CHECK WHEEL SENSOR HARNESS	
1. Turn the ignition switch OFF.	
 Disconnect ABS actuator and electric unit (control unit) harness connector. 	
2 Disconnect wheel senser harness connector	

Disconnect wheel sensor harness connector.

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ESP]

ABS actuator and ele	ABS actuator and electric unit (control unit) Wheel sensor		Continuity	
Connector	Terminal	Connector Terminal		Continuity
	23	23 E22 (Front LH wheel)		
E34	21	E39 (Front RH wheel)	<u> </u>	Existed
L34	26	B44 (Rear LH wheel)		LAISIEU
	11	B41 (Rear RH wheel)		

Measurement connector and terminal for signal circuit

ABS actuator and electric unit (control unit)		hit) Wheel sensor		Continuity	
Connector	Terminal	Connector Terminal		Continuity	
	27 E22 (Front LH wheel)	27			
E34	12	E39 (Front RH wheel)	2	Existed	
⊏34	30 B44 (F	B44 (Rear LH wheel)	Z	Existed	
	15	B41 (Rear RH wheel)			

Is the inspection result normal?

- YES >> GO TO 9.
- NO >> Repair or replace error-detected parts and GO TO 8.

8. PERFORM SELF-DIAGNOSIS (3)

()With CONSULT-III.

- T. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase Self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Stat the engine.
- 6. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 7. Stop the vehicle.
- 8. Perform self-diagnosis for "ABS".

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

YES >> GO TO 9.

NO >> INSPECTION END

9.REPLACE WHEEL SENSOR

With CONSULT-III.

- 1. Replace wheel sensor.
- Front: Refer to BRC-84, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to <u>BRC-86</u>, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase Self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Stat the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS".

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

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-</u> tion".
- NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Logic

DTC DETECTION LOGIC

		- 1	
		1	

INFOID:000000006600952

[WITHOUT ESP]

DTC	Display Item	Malfunction detected condition	Possible causes	
C1105	RR RH SENSOR-2	 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: 7.5 V ≥ Rear RH wheel sensor power supply voltage: 16 V ≤ 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. 		C D E BRC
C1106	RR LH SENSOR-2	 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: 7.5 V ≥ Rear LH wheel sensor power supply voltage. Rear LH wheel sensor power supply voltage: 16 V ≤ 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. 	 Harness or connector Wheel sensor ABS actuator and electric unit 	G H I
C1107	FR RH SENSOR-2	 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: 7.5 V ≥ Front RH wheel sensor power supply voltage Front RH wheel sensor power supply voltage: 16 V ≤ 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. 	(control unit) • Sensor rotor • Tire	J K L
C1108	FR LH SENSOR-2	 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: 7.5 V ≥ Front LH wheel sensor power supply voltage Front LH wheel sensor power supply voltage: 16 V 		M
		 ≤ 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. 		O

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

BRC-39

В

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ESP]

INFOID:000000006600953

2. CHECK DTC DETECTION

With CONSULT-III.

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

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

YES >> Proceed to <u>BRC-40, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Never check between wheel sensor harness connector terminals.

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

Check ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-64, "Diagnosis Proce-dure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK TIRE

- 1. Turn the ignition switch OFF.
- 2. Check tire air pressure, wear and size. Refer to WT-9. "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust air pressure or replace tire and GO TO 3.

3.CHECK DATA MONITOR (1)

()With CONSULT-III.

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

NOTE:

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

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

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

YES >> GO TO 4.

NO >> GO TO 5.

4.PERFORM SELF-DIAGNOSIS (1)

With CONSULT-III.

- 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS".
- Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 5.

NO >> INSPECTION END

5.CHECK WHEEL SENSOR

1. Turn the ignition switch OFF.

2. Check wheel sensor for damage.

< DTC/CIRCUIT DIAGNOSIS >	[WITHOUT ESP]
 Remove dust and foreign matter adhered to the sensor rotor with a vacuum wheel sensor mounting hole. CAUTION: 	n dust collector through the
Install wheel sensor with no backlash and float, and tighten the mour	ting bolt to the specified
torque.	
Front: Refer to <u>BRC-84</u> , "FRONT WHEEL SENSOR : Exploded View".	
Rear: Refer to <u>BRC-85, "REAR WHEEL SENSOR : Exploded View"</u> .	
Is the inspection result normal?	
YES >> GO TO 8. NO >> GO TO 6.	
6. REPLACE WHEEL SENSOR (1)	
With CONSULT-III.	
 Replace wheel sensor. Front: Refer to <u>BRC-84</u>, "FRONT WHEEL SENSOR : Removal and Installation 	n"
 Rear: Refer to <u>BRC-86</u>, "REAR WHEEL SENSOR : Removal and Installation" 	
2. Erase Self-diagnosis result for "ABS".	·
3. Turn the ignition switch OFF, and wait 10 seconds or more.	В
4. Stat the engine.	
Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SE and "RR RH SENSOR".	NOUK, KK LA SENSUR
NOTE:	
Set the "DATA MONITOR" recording speed to "10 msec".	
6. Read a value (wheel speed) of both normal wheel sensors and error-detecting	g wheel sensor.
Regarding the deference at 30 km/h (19 MPH) between the wheel speed deter	
wheel sensor and the maximum/minimum wheel speed detected by the normal	wheel sensors, is the differ-
ence within 5%, respectively?	
YES >> GO TO 7. NO >> GO TO 19.	
7. PERFORM SELF-DIAGNOSIS (2)	
With CONSULT-III.	
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. 	
 Perform self-diagnosis for "ABS". 	
Is DTC "C1105", "C1106", "C1107" or "C1108" detected?	
YES >> GO TO 19.	
NO >> INSPECTION END	
8. CHECK CONNECTOR	
 Turn the ignition switch OFF. Check ABS actuator and electric unit (control unit) harness connector for disc 	onnection or looseness
 Check wheel sensor harness connector for disconnection or looseness. 	
Is the inspection result normal?	
YES >> GO TO 11.	
NO >> Repair or replace error-detected parts, securely lock the connector, and	nd GO TO 9.
9. CHECK DATA MONITOR (2)	
	(
 With CONSULT-III. Erase Self-diagnosis result for "ABS". 	
 Turn the ignition switch OFF, and wait 10 seconds or more. 	
3. Stat the engine.	
4. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SE	NSOR", "RR LH SENSOR"
and "RR RH SENSOR". NOTE:	

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

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

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ESP]

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

YES >> GO TO 10.

NO >> GO TO 11.

10.PERFORM SELF-DIAGNOSIS (3)

With CONSULT-III.

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

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

YES >> GO TO 11.

NO >> INSPECTION END

11.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 14.

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

12.CHECK DATA MONITOR (3)

With CONSULT-III.

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

NOTE:

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

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

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

- YES >> GO TO 13.
- NO >> GO TO 14.
- **13.**PERFORM SELF-DIAGNOSIS (4)

With CONSULT-III.

- T. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS".
- Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 14.

- NO >> INSPECTION END
- 14. CHECK WHEEL SENSOR HARNESS
- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect wheel sensor harness connector.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ESP]

ABS actuator and el	ectric unit (control unit)			-	A
Connector	Terminal	_	Continuity		
	23, 27			-	В
E34	E34 Ground Not existed		D		
E34	26, 30	Ground	NULEXISTED		
	11, 15			_	С
Is the inspection res	sult normal?			-	
YES >> GO TO			0.45		D
'	or replace error-detec	ted parts and GO I	0 15.		D
15. СНЕСК ДАТА					
With CONSULT-I					Е
	ctuator and electric u sensor harness conn		ness connector.	-	
3. Erase Self-diag	nosis result for "ABS'				BRC
 Turn the ignition Stat the engine 	n switch OFF, and wa	t 10 seconds or mo	ore.		Bitte
6. Select "ABS" a	nd "DATA MONITOR	", check "FR LH SI	Ensor", "Fr Rh Se	NSOR", "RR LH SENSOR"	
and "RR RH SE NOTE:	ENSOR".				G
	MONITOR" recording	speed to "10 msec'			
	wheel speed) of both			g wheel sensor.	Н
				ected by the error detecting	
ence within 5%, res		n wheel speed det	ected by the normal	wheel sensors, is the differ-	
YES >> GO TO					
NO >> GO TO					
16.PERFORM SE	ELF-DIAGNOSIS (5)				J
With CONSULT-I					
 Drive the vehicle Stop the vehicle 	le at approx. 30 km/h e.	(19 MPH) or more f	or approx. 1 minute.		Κ
	agnosis for "ABS".				1.
	<u>1106", "C1107" or "C1</u>	108" detected?			
YES >> GO TO NO >> INSPE	17. CTION END				L
17.REPLACE WH					
					M
 With CONSULT-I Replace wheel 					
- Front: Refer to	BRC-84, "FRONT WI				
	BRC-86, "REAR WHE Inosis result for "ABS'		noval and Installation	<u>.</u> .	Ν
	n switch OFF, and wa		ore.		
4. Stat the engine					0
5. Select "ABS" a and "RR RH SE		, check "FR LH SI	ENSOR", "FR RH SE	NSOR", "RR LH SENSOR"	
NOTE:					-
	MONITOR" recording wheel speed) of both			a wheel sensor	Ρ
•	• •			ected by the error detecting	
wheel sensor and t	he maximum/minimu			wheel sensors, is the differ-	
ence within 5%, res					
YES >> GO TO NO >> GO TO					
NO 00 10	10.				

< DTC/CIRCUIT DIAGNOSIS >

18.PERFORM SELF-DIAGNOSIS (6)

With CONSULT-III.

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

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

- YES >> GO TO 19.
- NO >> INSPECTION END
- **19.**REPLACE SENSOR ROTOR

With CONSULT-III.

- 1. Replace sensor rotor.
- Front: Refer to BRC-84, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to <u>BRC-86</u>, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase Self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Stat the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS".

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

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-</u> tion".
- NO >> INSPECTION END

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1109 POWER AND GROUND SYSTEM

DTC Logic

INFOID:000000006600954

DTC	Disp	play Item	Malfunction detected condition	Possible causes
C1109	BATTERY VC [ABNORMAL]		 When ignition power supply voltage is in following state. Ignition power supply voltage: 10 V ≥ Ignition power supply voltage. Ignition power supply voltage: 16 V ≤ Ignition power supply voltage. 	Fuse
			URE	
		-		
			JRE" has been previously conducted, alway ducting the next test.	ys turn ignition switch OFF and
	>> GO TO 2			
2.CHE	CK DTC DET	TECTION		
	CONSULT-III			
		switch OFF to gnosis for "ABS		
	"C1109" dete	-		
YES	>> Proceed	to <u>BRC-45</u> , "D	agnosis Procedure".	
NO	>> INSPEC	TION END		
Diagn	osis Proce	dure		INFOID:00000006600955
1.сне		TOR		
l. Tur	n the ignition	switch OFF.		
			c unit (control unit) harness connector for d	isconnection or looseness.
	spection resu			
	>> GO TO 3 >> Repair o		detected parts, securely lock the connector	, and GO TO 2.
YES NO	•	-DIAGNOSIS		, ,
NO	FURIVI SELF			
NO 2.PER			ain.	
NO 2.PER Perform		is for "ABS" ag	ain.	
NO 2.PER Perform s DTC YES	n self-diagnos <u>"C1109" dete</u> >> GO TO 3	is for "ABS" ag <u>cted?</u> 3.	ain.	
NO 2.PER Perform s DTC YES NO	n self-diagnos <u>"C1109" dete</u> >> GO TO 3 >> INSPEC	is for "ABS" ag <u>cted?</u> 3. TION END		
NO 2.PER Perform <u>s DTC</u> YES NO 3.CHE	n self-diagnos <u>"C1109" dete</u> >> GO TO 3 >> INSPEC CK ABS ACT	is for "ABS" ag <u>cted?</u> 3. TION END ⁻ UATOR AND E	ain. ELECTRIC UNIT (CONTROL UNIT) IGNITI	ON POWER SUPPLY
NO 2.PER Perform <u>s DTC</u> YES NO 3.CHE	n self-diagnos <u>"C1109" dete</u> >> GO TO 3 >> INSPEC CK ABS ACT n the ignition	is for "ABS" ag <u>cted?</u> 3. TION END ⁻ UATOR AND E switch OFF.	ELECTRIC UNIT (CONTROL UNIT) IGNITI	
NO 2.PER Perform s DTC YES NO 3.CHE 1. Tur 2. Dis	n self-diagnos <u>"C1109" dete</u> >> GO TO 3 >> INSPEC CK ABS ACT n the ignition connect ABS	is for "ABS" ag <u>cted?</u> 3. TION END "UATOR AND E switch OFF. actuator and e		
NO 2.PER Perform s DTC YES NO 3.CHE 1. Tur 2. Dis	n self-diagnos <u>"C1109" dete</u> >> GO TO 3 >> INSPEC CK ABS ACT n the ignition connect ABS	is for "ABS" ag <u>cted?</u> 3. TION END "UATOR AND E switch OFF. actuator and e	ELECTRIC UNIT (CONTROL UNIT) IGNITI	
NO 2.PER Perform <u>s DTC</u> YES NO 3.CHE 1. Tur 2. Dis 3. Che	n self-diagnos <u>"C1109" dete</u> >> GO TO 3 >> INSPEC CK ABS ACT n the ignition connect ABS eck voltage b	is for "ABS" ag <u>cted?</u> 3. TION END "UATOR AND E switch OFF. actuator and e	ELECTRIC UNIT (CONTROL UNIT) IGNITIOn lectric unit (control unit) harness connector. tuator and electric unit (control unit) harnes	
NO 2.PER Perform <u>s DTC</u> YES NO 3.CHE 1. Tur 2. Dis 3. Che ABS	n self-diagnos <u>"C1109" dete</u> >> GO TO 3 >> INSPEC CK ABS ACT n the ignition connect ABS eck voltage b	is for "ABS" ag <u>cted?</u> 3. TION END WATOR AND E switch OFF. actuator and e etween ABS ac	ELECTRIC UNIT (CONTROL UNIT) IGNITIO	

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ESP]

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		vollage
E34	16	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

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

- 1. Turn the ignition switch OFF.
- 2. Check 10 A fuse (#57).
- 3. Disconnect IPDM E/R harness connector.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R harness connector.

ABS actuator and electric unit (control unit)		IPDM E/R		Continuity	
Connector	Terminal	Connector Terminal		Continuity	
E34	16	E15	59	Existed	

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

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal		Continuity
E34	16	Ground	Not existed

Is the inspection result normal?

- YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-15, "Wiring Diagram IGNITION</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

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

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

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal		Continuity	
E34	3	Ground	Existed	
L34	4	Ground	Existed	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK TERMINAL

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

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < DTC/CIRCUIT DIAGNOSIS > [WITHOUT ESP]

C1110 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Logic

INFOID:000000006600956

А

L

Μ

Ν

Ο

Ρ

DICL	ogio		INFOID:000000000000000000000000000000000000		
DTC DE	ETECTION LOGIC			В	
DTC	Display Item	Malfunction detected condition	Possible causes		
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS ac- tuator and electric unit (control unit).	ABS actuator and electric unit (control unit)	С	
DTC CO	ONFIRMATION PROCED	JRE		_	
1.PREG	CONDITIONING			D	
	CONFIRMATION PROCEDU east 10 seconds before conc	JRE" has been previously conducted, always lucting the next test.	turn ignition switch OFF and	E	
0	>> GO TO 2.			BRC	
	CK DTC DETECTION			DRC	
1. Turr 2. Perl	CONSULT-III. n the ignition switch OFF to (form self-diagnosis for "ABS <u> 'C1110" detected?</u>			G	
YES >> Proceed to <u>BRC-47, "Diagnosis Procedure"</u> . NO >> INSPECTION END					
Diagno	osis Procedure		INFOID:00000006600957		
1.CHECK SELF-DIAGNOSIS RESULTS					
	ABS actuator and electric is for "ABS".	unit (control unit) even if other display than	"C1110" is displayed in self-	J	
	>> Replace ABS actuator a <u>tion"</u> .	and electric unit (control unit). Refer to BRC	C-90. "Removal and Installa-	K	

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Logic

INFOID:000000006600958

[WITHOUT ESP]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III.

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

Is DTC "C1111" detected?

YES >> Proceed to <u>BRC-48, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006600959

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1111" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		voltage
E34	1	Ground	10 – 16 V

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ESP]

ABS actuator and ele	ctric unit (control unit)		Voltage	
Connector	Terminal	_	Voltage	
E34	1	Ground	10 – 16 V	
s the inspection re	sult normal?			
YES >> GO TO				
NO >> GO TO				
	OTOR AND MOTO	R RELAY PO	WER SUPPLY (CIRCUIT
 Turn the ignition Check 30 A fu 				
		between ABS	actuator and el	ectric unit (control unit) harness connector
	d 30 A fusible link (
s the inspection re	sult normal?			
		s for battery po	wer supply. Ref	er to PG-10, "Wiring Diagram - BATTERY
	<u>R SUPPLY -"</u> . or replace error-de	etected narts		
		•		NIT) GROUND CIRCUIT
 Turn the ignition Check continut 		ctuator and ele	ctric unit (contro	ol unit) harness connector and the ground.
				and namess connector and the ground.
ABS actuator and ele	ectric unit (control unit)			
ABS actuator and ele Connector	ectric unit (control unit) Terminal	_	Continuity	
Connector		_		
	Terminal	— Ground	Continuity Existed	
Connector E34	Terminal 3 4	— Ground		
Connector	Terminal 3 4 esult normal?	— Ground		
Connector E34 s the inspection re YES >> GO TO	Terminal 3 4 esult normal?			
Connector E34 s the inspection re YES >> GO TO	Terminal 3 4 esult normal? 0 6. or replace error-de			• •
E34 E34 S the inspection re YES >> GO TO NO >> Repair CHECK TERMI Check ABS actuat	Terminal 3 4 esult normal? 0 6. or replace error-de	etected parts.	Existed	damage or loose connection with harness
E34 E34 S the inspection re YES >> GO TO NO >> Repair CHECK TERMI	Terminal 3 4 esult normal? 0 6. or replace error-de	etected parts.	Existed	damage or loose connection with harness
E34 <u>s the inspection re</u> YES >> GO TO NO >> Repair D .CHECK TERMI Check ABS actuat connector. <u>s the inspection re</u>	Terminal 3 4 esult normal? 0 6. or replace error-de NAL or and electric unit esult normal?	etected parts. (control unit) p	Existed	-
Connector E34 s the inspection regime YES >> GO TO NO >> Repain D.CHECK TERMI Check ABS actuat connector. s the inspection regime YES >> Replace	Terminal 3 4 esult normal? 0 6. or replace error-de NAL or and electric unit esult normal?	etected parts. (control unit) p	Existed	damage or loose connection with harness Refer to <u>BRC-90, "Removal and Installa-</u>
E34 <u>s the inspection re</u> YES >> GO TO NO >> Repair CHECK TERMI Check ABS actuat connector. <u>s the inspection re</u> YES >> Replac <u>tion</u> .	Terminal 3 4 esult normal? 0 6. or replace error-de NAL or and electric unit esult normal? ce ABS actuator ar	etected parts. (control unit) p nd electric unit	Existed	-
E34 <u>s the inspection re</u> YES >> GO TO NO >> Repair CHECK TERMI Check ABS actuat connector. <u>s the inspection re</u> YES >> Replac <u>tion</u> .	Terminal 3 4 esult normal? 0 6. or replace error-de NAL or and electric unit esult normal?	etected parts. (control unit) p nd electric unit	Existed	-
E34 <u>s the inspection re</u> YES >> GO TO NO >> Repair CHECK TERMI Check ABS actuat connector. <u>s the inspection re</u> YES >> Replac <u>tion</u> .	Terminal 3 4 esult normal? 0 6. or replace error-de NAL or and electric unit esult normal? ce ABS actuator ar	etected parts. (control unit) p nd electric unit	Existed	-
E34 <u>s the inspection re</u> YES >> GO TO NO >> Repair CHECK TERMI Check ABS actuat connector. <u>s the inspection re</u> YES >> Replac <u>tion</u> .	Terminal 3 4 esult normal? 0 6. or replace error-de NAL or and electric unit esult normal? ce ABS actuator ar	etected parts. (control unit) p nd electric unit	Existed	-
E34 <u>s the inspection re</u> YES >> GO TO NO >> Repair CHECK TERMI Check ABS actuat connector. <u>s the inspection re</u> YES >> Replac <u>tion</u> .	Terminal 3 4 esult normal? 0 6. or replace error-de NAL or and electric unit esult normal? ce ABS actuator ar	etected parts. (control unit) p nd electric unit	Existed	-
E34 <u>s the inspection re</u> YES >> GO TO NO >> Repair CHECK TERMI Check ABS actuat connector. <u>s the inspection re</u> YES >> Replac <u>tion"</u> .	Terminal 3 4 esult normal? 0 6. or replace error-de NAL or and electric unit esult normal? ce ABS actuator ar	etected parts. (control unit) p nd electric unit	Existed	-
E34 <u>s the inspection re</u> YES >> GO TO NO >> Repair CHECK TERMI Check ABS actuat connector. <u>s the inspection re</u> YES >> Replac <u>tion"</u> .	Terminal 3 4 esult normal? 0 6. or replace error-de NAL or and electric unit esult normal? ce ABS actuator ar	etected parts. (control unit) p nd electric unit	Existed	-

Ρ

< DTC/CIRCUIT DIAGNOSIS >

C1115 WHEEL SENSOR

DTC Logic

INFOID:000000006600960

INFOID:000000006600961

[WITHOUT ESP]

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III.

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

Is DTC "C1115" detected?

- YES >> Proceed to <u>BRC-50, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

For wheel sensor, never check between terminals.

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

Check ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-64. "Diagnosis Proce-</u> dure".

Is the inspection result normal?

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

2.CHECK TIRE

- 1. Turn the ignition switch OFF.
- 2. Check tire air pressure, wear and size. Refer to <u>WT-9, "Tire Air Pressure"</u>.
- Is the inspection result normal?
- YES >> GO TO 5.
- NO >> Adjust air pressure or replace tire and GO TO 3.

3.CHECK DATA MONITOR (1)

(B) With CONSULT-III.

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

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ESP]

Set the "DATA MONITOR" recording speed to "10 msec".	
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.	А
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ-	
ence within 5%, respectively?	В
YES >> GO TO 4. NO >> GO TO 5.	D
	0
4.PERFORM SELF-DIAGNOSIS (1)	С
With CONSULT-III.	
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. 	D
3. Perform self-diagnosis for "ABS".	
Is DTC "C1115" detected?	
YES >> GO TO 5.	Ε
NO >> INSPECTION END	
5.CHECK WHEEL SENSOR	
1. Turn the ignition switch OFF.	BR
2. Check wheel sensor for damage.	
3. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the	G
wheel sensor mounting hole. CAUTION:	G
Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified	
torque.	Н
Front: Refer to <u>BRC-84, "FRONT WHEEL SENSOR : Exploded View"</u> .	
Rear: Refer to <u>BRC-85, "REAR WHEEL SENSOR : Exploded View"</u> .	
Is the inspection result normal?	
YES >> GO TO 8. NO >> GO TO 6.	
6. REPLACE WHEEL SENSOR (1)	J
With CONSULT-III.	
 Replace wheel sensor. Front: Refer to <u>BRC-84, "FRONT WHEEL SENSOR : Removal and Installation"</u>. 	Κ
 Rear: Refer to <u>BRC-86</u>, "REAR WHEEL SENSOR : Removal and Installation". 	
2. Erase Self-diagnosis result for "ABS".	
3. Turn the ignition switch OFF, and wait 10 seconds or more.	L
 Stat the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" 	
and "RR RH SENSOR".	
NOTE:	Μ
Set the "DATA MONITOR" recording speed to "10 msec".	
6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor. Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting	Ν
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ-	IN
ence within 5%, respectively?	
YES >> GO TO 7.	0
NO >> GO TO 19.	
1.PERFORM SELF-DIAGNOSIS (2)	
With CONSULT-III.	٢
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle 	
 Stop the vehicle. Perform self-diagnosis for "ABS". 	
Is DTC "C1115" detected?	
YES >> GO TO 19.	
NO >> INSPECTION END	

< DTC/CIRCUIT DIAGNOSIS >

8. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 11.

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

9.CHECK DATA MONITOR (2)

With CONSULT-III.

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

NOTE:

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

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

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

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

10. PERFORM SELF-DIAGNOSIS (3)

(B)With CONSULT-III.

- T. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS".
- Is DTC "C1115" detected?
- YES >> GO TO 11.
- NO >> INSPECTION END
- **11.**CHECK TERMINAL
- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.

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

12. CHECK DATA MONITOR (3)

(B) With CONSULT-III.

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

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

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

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

٢W	ітно	DUT	ESP]
L			-0.1

Ο

Ρ

DIC/CIRCUIT DI	AGINUSIS >			[
'ES >> GO TO				
10 >> GO TO 2 ====================================				
	LF-DIAGNOSIS (4)			
With CONSULT-I		(19 MPH) or more fo	r approx 1 minute	
Stop the vehicle).			
	ignosis for "ABS".			
<u>DTC "C1115" dete</u> ′ES >> GO TO				
	CTION END			
4.CHECK WHEE	EL SENSOR HARNE	SS		
Turn the ignitior				
Disconnect ABS	S actuator and electri	ic unit (control unit) ha	arness connector.	
	el sensor harness co v between ABS actu	onnector. ator and electric unit ((control unit) harnes	s connector and whe
sor harness cor	nector. (Check conti	nuity when steering w		
in wheel housin	-			
	ctor and terminal for power			1
	ectric unit (control unit)	Wheels		Continuity
Connector	Terminal	Connector	Terminal	
	23	E22 (Front LH wheel)		
E34	21 26	E39 (Front RH wheel) B44 (Rear LH wheel)	1	Existed
	11	B41 (Rear RH wheel)		
Measurement conne	ctor and terminal for signal	, , , , , , , , , , , , , , , , , , ,		
	ectric unit (control unit)	Wheels	sensor	
Connector	Terminal	Connector	Terminal	Continuity
	27	E22 (Front LH wheel)		
524	12	E39 (Front RH wheel)	0	
E34	30	B44 (Rear LH wheel)	2	Existed
	15	B41 (Rear RH wheel)		
Check continuit	y between ABS actu	ator and electric unit (control unit) harnes	s connector and the
		,		<u>.</u>
ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal		,	-
	23, 27	_		
E34	21, 12	Ground	Not existed	
	26, 30	-		

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 15.

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

11, 15

15. CHECK DATA MONITOR (4)

With CONSULT-III. 1. Connect ABS actuator and electric unit (control unit) harness connector.

2. Connect wheel sensor harness connector.

3. Erase Self-diagnosis result for "ABS".

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

Stat the engine. 5.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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

NOTE:

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

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

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

YES >> GO TO 16.

NO >> GO TO 17.

16.PERFORM SELF-DIAGNOSIS (5)

() With CONSULT-III.

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

Is DTC "C1115" detected?

YES >> GO TO 17.

NO >> INSPECTION END

17.REPLACE WHEEL SENSOR

With CONSULT-III.

- 1. Replace wheel sensor.
- Front: Refer to BRC-84. "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-86, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase Self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Stat the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

- Set the "DATA MONITOR" recording speed to "10 msec".
- 6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

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

YES >> GO TO 18.

NO >> GO TO 19.

18.PERFORM SELF-DIAGNOSIS (6)

BWith CONSULT-III.

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

Is DTC "C1115" detected?

YES >> GO TO 19.

- NO >> INSPECTION END
- **19.**REPLACE SENSOR ROTOR

With CONSULT-III.

1. Replace sensor rotor.

- Front: Refer to BRC-84, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to <u>BRC-86</u>, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase Self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Stat the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.
- 7. Perform self-diagnosis for "ABS".

< DTC/CIRCUIT DIAGNOSIS >

s	DT	<u>`C '</u>	<u>'C11</u>	15"	detected?	

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-</u> A <u>tion"</u>.
- NO >> INSPECTION END

BRC

В

С

D

Е

Н

J

Κ

L

Μ

Ν

Ο

Ρ

G

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Logic

INFOID:000000006600962

INEOID-000000006600963

[WITHOUT ESP]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

()With CONSULT-III

Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS".

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

- YES >> Proceed to <u>BRC-56</u>, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

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

YES >> GO TO 3.

NO >> INSPECTION END

 ${
m 3.}$ CHECK ABS IN VALVE POWER SUPPLY

1. Turn the ignition switch OFF.

2. Disconnect ABS actuator and electric unit (control unit) harness connector.

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Connector Terminal		voltage
E34	2	Ground	10 – 16 V

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM < DTC/CIRCUIT DIAGNOSIS > [WITHOUT ESP]

Turn the ignition switch ON. 4. CAUTION: А Never start engine. 5. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground. В ABS actuator and electric unit (control unit) Voltage Connector Terminal E34 2 10 - 16 V Ground Is the inspection result normal? YES >> GO TO 5. D NO >> GO TO 4. CHECK ABS IN VALVE POWER SUPPLY CIRCUIT 1. Turn the ignition switch OFF. Е Check 40 A fusible link (F). 2. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector 3. terminal (2) and 40 A fusible link (F). BRC Is the inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to PG-10, "Wiring Diagram - BATTERY POWER SUPPLY -" NO >> Repair or replace error-detected parts. ${f 5.}$ CHECK ABS IN VALVE GROUND CIRCUIT Н 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit) Continuity Connector Terminal 3 E34 Ground Existed 4 Is the inspection result normal? YES >> GO TO 6. Κ NO >> Repair or replace error-detected parts. **6.**CHECK TERMINAL L Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Is the inspection result normal? Μ YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-90, "Removal and Installation".

NO >> Repair or replace error-detected parts.

Ν

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Logic

INFOID:000000006600967

INEOID-000000006600968

[WITHOUT ESP]

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1121	FR LH OUT ABS SOL	When a malfunction is detected in front LH ABS OUT valve.	
C1123	FR RH OUT ABS SOL	When a malfunction is detected in front RH ABS OUT valve.	 Harness or connector ABS actuator and electric unit (control unit)
C1125	RR LH OUT ABS SOL	When a malfunction is detected in rear LH ABS OUT valve.	 Fusible link Battery power supply system
C1127	RR RH OUT ABS SOL	When a malfunction is detected in rear RH ABS OUT valve.	1

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

()With CONSULT-III

Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS".

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

- YES >> Proceed to <u>BRC-58</u>, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

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

YES >> GO TO 3.

NO >> INSPECTION END

3.CHECK ABS OUT VALVE POWER SUPPLY

1. Turn the ignition switch OFF.

2. Disconnect ABS actuator and electric unit (control unit) harness connector.

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

ABS actuator and	electric unit (control unit)		Voltage	
Connector Terminal			voltage	
E34	2	Ground	10 – 16 V	

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

[WITHOUT ESP] 4. Turn the ignition switch ON. CAUTION: А Never start engine. 5. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground. В ABS actuator and electric unit (control unit) Voltage Connector Terminal E34 2 10 - 16 V Ground Is the inspection result normal? YES >> GO TO 5. D NO >> GO TO 4. 4.CHECK ABS OUT VALVE POWER SUPPLY CIRCUIT 1. Turn the ignition switch OFF. Е 2. Check 40 A fusible link (F). Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector 3. terminal (2) and 40 A fusible link (F). BRC Is the inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to PG-10, "Wiring Diagram - BATTERY POWER SUPPLY -" NO >> Repair or replace error-detected parts. 5.CHECK ABS OUT VALVE GROUND CIRCUIT Н 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit) Continuity Connector Terminal 3 E34 Ground Existed 4 Is the inspection result normal? YES >> GO TO 6. Κ NO >> Repair or replace error-detected parts. **6.**CHECK TERMINAL L Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Is the inspection result normal? Μ YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-90, "Removal and Installation". NO >> Repair or replace error-detected parts. Ν

Ρ

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1140 ACTUATOR RELAY SYSTEM

DTC Logic

INFOID:000000006600970

[WITHOUT ESP]

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.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III.

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

Is DTC "C1140" detected?

YES >> Proceed to <u>BRC-60, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006600971

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> INSPECTION END

${\it 3.}$ check actuator relay power supply

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector Terminal			voltage	
E34	2	Ground	10 – 16 V	

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ESP]

Connector Terminal Intersection E34 2 Ground 10 - 16 V Sthe inspection result normal? YES >> GO TO 4. 4. CHECK ACTUATOR RELAY POWER SUPPLY CIRCUIT . . 1. Turn the ignition switch OFF. . . 2. Check 40 A fusible link (F). . . 3. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 40 A fusible link (F). . S. The inspection result normal? . . YES >> Perform trouble diagnosis for battery power supply. Refer to PG-10. "Wiring Diagram - BATTERY POWER SUPPLY -". NO >> Repair or replace error-detected parts. . C.CHECK ACTUATOR RELAY GROUND CIRCUIT . . 1. Turn the ignition switch OFF. . . 2. Check continuity between ABS actuator and electric unit (control unit)		ctric unit (control unit)	_	Voltage		
is the inspection result normal? YES >> GO TO 5. NO >> GO TO 4. 4CHECK ACTUATOR RELAY POWER SUPPLY CIRCUIT 1. Turn the ignition switch OFF. 2. Check 40 A fusible link (F). 3. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 40 A fusible link (F). is the inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to PG-10. "Wiring Diagram - BATTERY POWER SUPPLY -". NO >> Repair or replace error-detected parts. DCHECK ACTUATOR RELAY GROUND CIRCUIT 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit)	Connector	Terminal		g-		
YES >> GO TO 5. NO >> GO TO 4. 4.CHECK ACTUATOR RELAY POWER SUPPLY CIRCUIT 1. Turn the ignition switch OFF. 2. Check 40 A fusible link (F). 3. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 40 A fusible link (F). 3. the inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to PG-10. "Wiring Diagram - BATTERY POWER SUPPLY". NO >> Repair or replace error-detected parts. D.CHECK ACTUATOR RELAY GROUND CIRCUIT 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit) Connector Terminal Ground Existed 2. Sthe inspection result normal? YES > GO TO 6. NO > Repair or replace error-detected parts. CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Scheck ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installation".</u> NO >> Repair or replace error-d	E34	2	Ground	10 – 16 V		
NO ⇒> GO TO 4. 4. CHECK ACTUATOR RELAY POWER SUPPLY CIRCUIT Turn the ignition switch OFF. 2. Check 40 A fusible link (F). 3. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 40 A fusible link (F). 5. The inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to PG-10. "Wiring Diagram - BATTERY POWER SUPPLY -". NO >> Repair or replace error-detected parts. C.CHECK ACTUATOR RELAY GROUND CIRCUIT 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit) <u>Connector</u> Terminal <u>Connector</u> Terminal? YES YES So GO TO 6. NO NO YES So GO TO 6. NO YES YES YES YES YES YES YES YES YES YES <tr< td=""><td></td><td>sult normal?</td><td></td><td></td><td></td><td></td></tr<>		sult normal?				
A.CHECK ACTUATOR RELAY POWER SUPPLY CIRCUIT Turn the ignition switch OFF. Check 40 A fusible link (F). Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 40 A fusible link (F). sthe inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to PG-10. "Wiring Diagram - BATTERY <u>POWER SUPPLY -"</u> . No >> Repair or replace error-detected parts. CHECK ACTUATOR RELAY GROUND CIRCUIT Turn the ignition switch OFF. Continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit) Connector Terminal Continuity Connector Terminal Continuity Sthe inspection result normal? YES >> GO TO 6. No >> Repair or replace error-detected parts. CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90. "Removal and Installation".</u> No >> Repair or replace error-detected parts.						
Turn the ignition switch OFF. Check 40 A fusible link (F). Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 40 A fusible link (F). s the inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to PG-10. "Wiring Diagram - BATTERY POWER SUPPLY" NO >> Repair or replace error-detected parts. C.CHECK ACTUATOR RELAY GROUND CIRCUIT Turn the ignition switch OFF. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. <u>ABS actuator and electric unit (control unit)</u> <u>a</u> <u>a</u> <u>a</u> <u>Ground</u> Existed s the inspection result normal? YES >> GO TO 6. NO >> Repair or replace error-detected parts. C.CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90. "Removal and Installation"</u> . NO >> Repair or replace error-detected parts. NO >> Repair or replace error-detected parts.	4	-				
 2. Check 40[°] A fusible link (F). 3. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 40 A fusible link (F). 3. the inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-10. "Wiring Diagram - BATTERY POWER SUPPLY -"</u>. NO >> Repair or replace error-detected parts. D.CHECK ACTUATOR RELAY GROUND CIRCUIT 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit) Continuity <u>a</u> <u>a</u> <u>a</u> <u>a</u> <u>a</u> <u>a</u> <u>a</u> <u>a</u> <u>a</u> <u>a</u>			/ER SUPPLY (CIRCUIT		
 B. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 40 A fusible link (F). S the inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-10. "Wiring Diagram - BATTERY POWER SUPPLY -"</u>. NO >> Repair or replace error-detected parts. D.CHECK ACTUATOR RELAY GROUND CIRCUIT I. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit) <u>Continuity</u> <u>Connector Terminal</u> <u>Continuity</u> <u>5 the inspection result normal?</u> YES >> GO TO 6. NO => Repair or replace error-detected parts. D.CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. <u>5 the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. <u>5 the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. <u>5 the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90. "Removal and Installation"</u>. NO >> Repair or replace error-detected parts. 						
terminal (2) and 40 A fusible link (F). s the inspection result normal? YES >> Perform trouble diagnosis for battery power supply. Refer to PG-10. "Wiring Diagram - BATTERY POWER SUPPLY -". NO >> Repair or replace error-detected parts. O.CHECK ACTUATOR RELAY GROUND CIRCUIT 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit)			t between ABS	actuator and el	ectric unit (control unit) harness connector	
YES >> Perform trouble diagnosis for battery power supply. Refer to PG-10. "Wiring Diagram - BATTERY POWER SUPPLY". NO >> Repair or replace error-detected parts. D.CHECK ACTUATOR RELAY GROUND CIRCUIT 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit)						
POWER SUPPLY -". NO >> Repair or replace error-detected parts. 5.CHECK ACTUATOR RELAY GROUND CIRCUIT 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit)	s the inspection re	<u>esult normal?</u>				
NO >> Repair or replace error-detected parts. D.CHECK ACTUATOR RELAY GROUND CIRCUIT 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit)			s for battery po	ower supply. Ref	fer to PG-10, "Wiring Diagram - BATTERY	
5. CHECK ACTUATOR RELAY GROUND CIRCUIT 1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit) — Continuity <u>ABS actuator and electric unit (control unit)</u> — Continuity <u>Connector</u> Terminal <u>E34</u> <u>3</u> <u>Ground</u> Existed Is the inspection result normal? YES >> GO TO 6. NO >> Repair or replace error-detected parts. 6. CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installation".</u>			etected parts			
1. Turn the ignition switch OFF. 2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit)		•	•	-		
2. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground. ABS actuator and electric unit (control unit) Continuity Connector Terminal Continuity E34 3 Ground Existed s the inspection result normal? YES > GO TO 6. NO NO >> Repair or replace error-detected parts. S.CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-90. "Removal and Installation".						_
ABS actuator and electric unit (control unit) Continuity Connector Terminal E34 3 4 Ground Ested s the inspection result normal? YES >> GO TO 6. NO >> Repair or replace error-detected parts. 6 .CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-90, "Removal and Installation".			ctuator and old	etric unit (contro	al unit) harness connector and the ground	
Connector Terminal Continuity E34 3 Ground Existed s the inspection result normal? YES >> GO TO 6. YES >> GO TO 6. NO NO >> Repair or replace error-detected parts. D.CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-90. "Removal and Installation".		ity between Abo a				
Connector Terminal Continuity E34 3 Ground Existed s the inspection result normal? YES >> GO TO 6. YES >> GO TO 6. NO NO >> Repair or replace error-detected parts. D.CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-90. "Removal and Installation".	ABS actuator and ele	ectric unit (control unit)				
E34 Ground Existed s the inspection result normal? YES >> GO TO 6. NO >> Repair or replace error-detected parts. S.CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. S the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-90, "Removal and Installation".		1		Continuity		
4 s the inspection result normal? YES >> GO TO 6. NO >> Repair or replace error-detected parts. 6. CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-90. "Removal and Installation".		3			-	
 YES >> GO TO 6. NO >> Repair or replace error-detected parts. CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Is the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90. "Removal and Installation"</u>. 	E34	4	Ground	Existed		
YES >> GO TO 6. NO >> Repair or replace error-detected parts. 6. CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-tion"</u> .	s the inspection re	esult normal?			•	
 CHECK TERMINAL Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90. "Removal and Installation"</u>. 						
Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-tion"</u> .	NO >> Repair	r or replace error-d	etected parts.			
 connector. <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-tion"</u>. 	6. CHECK TERMI	NAL				
 <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-tion"</u>. 	Check ABS actuat	or and electric unit	(control unit) p	oin terminals for	damage or loose connection with harness	
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-</u> tion".	connector.				-	
tion".						
		ce ABS actuator a	nd electric uni	t (control unit).	Refer to BRC-90, "Removal and Installa-	
		r or replace error-d	etected parts			

Ρ

U1000 CAN COMM CIRCUIT

Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:000000006600973

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

(B) With CONSULT-III

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

Is DTC "U1000" detected?

- YES >> Proceed to <u>BRC-62</u>, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

Proceed to LAN-17, "Trouble Diagnosis Flow Chart".

INFOID:000000006600974

INFOID:000000006600972

< DTC/CIRCUIT DIAGNOSIS >

U1010 CONTROL UNIT (CAN)

Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:000000006383085

А

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible causes	E
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)	BR
DTC CC	ONFIRMATION PROCE	DURE		
1.PREC	CONDITIONING			G
		DURE" has been previously conducted, always	turn ignition switch OFF and	
wait at le	east 10 seconds before co	onducting the next test.		Н
	>> GO TO 2.			
2.сне	CK DTC DETECTION			1
(P)With (CONSULT-III			
	n the ignition switch OFF t form self-diagnosis for "AB			I
	U1010" detected?			J
YES	>> Proceed to BRC-63, "	Diagnosis Procedure".		
NO	>> INSPECTION END			K
Diagno	osis Procedure		INFOID:00000006383086	
1. CHE	CK ABS ACTUATOR AND	ELECTRIC UNIT (CONTROL UNIT)		L
Check A	BS actuator and electric u	unit (control unit) harness connector for disconr	ection and deformation.	
Is the ins	spection result normal?			M
YES	>> Replace ABS actuato tion".	or and electric unit (control unit). Refer to <u>BRC</u>	C-90, "Removal and Installa-	
NO	>> Repair or replace erro	pr-detected parts.		Ν
				0
				0

Ρ

INFOID:000000006600976

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000006600977

[WITHOUT ESP]

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

1. Turn the ignition switch OFF.

2. Disconnect ABS actuator and electric unit (control unit) harness connector.

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

ABS actuator and ele	ctric unit (control unit)		Voltage	
Connector	Connector Terminal		vollage	
E34	16	Ground	Approx. 0 V	

4. Turn the ignition switch ON

CAUTION: Never start engine.

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

ABS actuator and ele	ctric unit (control unit)		Voltage	
Connector	Terminal		voltage	
E34	16	Ground	10 – 16 V	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

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

1. Turn the ignition switch OFF.

2. Check 10 A fuse (#57).

3. Disconnect IPDM E/R harness connector.

4. Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R harness connector.

ABS actuator and	d electric unit (control unit)	IPDN	Continuity	
Connector Terminal		Connector		Terminal
E34	16	E15	59	Existed

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

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector Terminal			Continuity	
E34	16	Ground	Not existed	

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-15, "Wiring Diagram - IGNITION</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

$\mathbf{3.}$ Check motor and motor relay power supply

1. Turn the ignition switch OFF.

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		voltage
E34	1	Ground	10 – 16 V

POWER SUPPLY AND GROUND CIRCUIT

Turn the iar	T DIAGNOSIS >			[WITHOUT ESP]
CAUTION:	nition switch ON.			
Never start	engine.			
		uator and elect	ric unit (contro	unit) harness connector and ground.
ABS actuator and	d electric unit (control unit)		Voltage	
Connector	Terminal		voltage	
E34	1	Ground	10 – 16 V	
s the inspection	n result normal?			
YES >> GO				
NO >> GO				
4.CHECK MO	FOR AND MOTOR RE	ELAY POWER	SUPPLY CIRC	CUIT
	nition switch OFF.			
	fusible link (K).	between ABS	actuator and	electric unit (control unit) harness connector
	and 30 A fusible link			
()	n result normal?	. /		
YES >> Per	form trouble diagnosis	s for battery po	ower supply. Re	efer to <u>PG-10, "Wiring Diagram - BATTERY</u>
<u>PO</u>	WER SUPPLY -".		· · · *	
	pair or replace error-de	•		
D. CHECK ACT	UATOR RELAY, ABS	IN VALVE, AB	S OUT VALVE	POWER SUPPLY
	nition switch OFF.			
2. Check volta	ge between ABS actu	uator and elect	ric unit (contro	unit) harness connector and ground.
ABS actuator and	electric unit (control unit)	_	Valtaria	
Connector	Terminal		voitage	
	renninai		Voltage	-
E34	2	Ground	10 – 16 V	-
E34 3. Turn the igr		Ground		- -
E34 3. Turn the igr CAUTION:	2 nition switch ON	Ground		- -
E34 3. Turn the igr CAUTION: Never start	2 nition switch ON		10 – 16 V	unit) harness connector and ground.
E34 3. Turn the igr CAUTION: Never start	2 nition switch ON		10 – 16 V	unit) harness connector and ground.
E34 3. Turn the igr CAUTION: Never start 4. Check volta	2 nition switch ON		10 – 16 V ric unit (contro	unit) harness connector and ground.
E34 3. Turn the igr CAUTION: Never start 4. Check volta	2 nition switch ON t engine. nge between ABS actu		10 – 16 V	unit) harness connector and ground.
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and	2 nition switch ON t engine. tige between ABS actu		10 – 16 V ric unit (contro	unit) harness connector and ground.
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34	2 hition switch ON t engine. age between ABS actu electric unit (control unit) Terminal 2	uator and elect	10 – 16 V ric unit (contro Voltage	unit) harness connector and ground.
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34	2 hition switch ON t engine. age between ABS actu electric unit (control unit) Terminal 2 n result normal?	uator and elect	10 – 16 V ric unit (contro Voltage	unit) harness connector and ground.
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34 Is the inspectior	2 nition switch ON a engine. age between ABS actu electric unit (control unit) Terminal 2 n result normal? TO 7.	uator and elect	10 – 16 V ric unit (contro Voltage	unit) harness connector and ground.
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34 Is the inspectior YES >> GO NO >> GO	2 inition switch ON t engine. toge between ABS actu electric unit (control unit) Terminal 2 n result normal? TO 7. TO 6.	uator and elect	10 – 16 V ric unit (contro Voltage 10 – 16 V	unit) harness connector and ground.
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34 Is the inspectior YES >> GO NO >> GO 6.CHECK ACT	2 hition switch ON t engine. tige between ABS actu electric unit (control unit) Terminal 2 n result normal? TO 7. TO 7. TO 6. UATOR RELAY, ABS	uator and elect	10 – 16 V ric unit (contro Voltage 10 – 16 V	-
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34 Is the inspectior YES >> GO NO >> GO 6.CHECK ACT 1. Turn the igr	2 inition switch ON t engine. toge between ABS actu electric unit (control unit) Terminal 2 n result normal? TO 7. TO 6.	uator and elect	10 – 16 V ric unit (contro Voltage 10 – 16 V	-
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34 Is the inspection YES >> GO NO >> GO O.CHECK ACT 1. Turn the igr 2. Check 40 A 3. Check cont	2 nition switch ON a engine. age between ABS actume electric unit (control unit) Terminal 2 n result normal? TO 7. TO 6. "UATOR RELAY, ABS nition switch OFF. fusible link (F). inuity and short circuit	Uator and elect Ground IN VALVE, AB	10 – 16 V ric unit (contro Voltage 10 – 16 V	-
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34 Is the inspection YES >> GO NO >> GO 6.CHECK ACT 1. Turn the igr 2. Check 40 A 3. Check cont terminal (2)	2 inition switch ON a engine. ige between ABS acture electric unit (control unit) Terminal 2 n result normal? TO 7. TO 6. UATOR RELAY, ABS inition switch OFF. fusible link (F). inuity and short circuit and 40 A fusible link	Uator and elect Ground IN VALVE, AB	10 – 16 V ric unit (contro Voltage 10 – 16 V	POWER SUPPLY CIRCUIT
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34 Is the inspection YES >> GO NO >> GO 6.CHECK ACT 1. Turn the igr 2. Check 40 A 3. Check cont terminal (2) Is the inspection	2 inition switch ON t engine. tige between ABS acturnation electric unit (control unit) Terminal 2 n result normal? TO 7. TO 6. TUATOR RELAY, ABS nition switch OFF. fusible link (F). inuity and short circuit and 40 A fusible link (F) n result normal?	IN VALVE, AB	10 – 16 V ric unit (contro Voltage 10 – 16 V S OUT VALVE	POWER SUPPLY CIRCUIT
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34 Is the inspection YES >> GO NO >> GO 6.CHECK ACT 1. Turn the igr 2. Check 40 A 3. Check cont terminal (2) Is the inspection YES >> Per	2 nition switch ON t engine. tige between ABS acture electric unit (control unit) Terminal 2 n result normal? TO 7. TO 6. TUATOR RELAY, ABS nition switch OFF. fusible link (F). inuity and short circuit and 40 A fusible link (F) form trouble diagnosis	IN VALVE, AB	10 – 16 V ric unit (contro Voltage 10 – 16 V S OUT VALVE	POWER SUPPLY CIRCUIT
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34 Is the inspection YES $>>$ GO NO $>>$ GO 6.CHECK ACT 1. Turn the igr 2. Check 40 A 3. Check cont terminal (2) Is the inspection YES $>>$ Per PO	2 nition switch ON t engine. tige between ABS acture electric unit (control unit) Terminal 2 n result normal? TO 7. TO 6. 'UATOR RELAY, ABS nition switch OFF. fusible link (F). inuity and short circuit and 40 A fusible link (form trouble diagnosis) WER SUPPLY -".	IN VALVE, AB	10 – 16 V ric unit (contro Voltage 10 – 16 V S OUT VALVE	POWER SUPPLY CIRCUIT
E34 3. Turn the igr CAUTION: Never start 4. Check volta ABS actuator and Connector E34 Is the inspection YES $>>$ GO NO $>>$ GO 6. CHECK ACT 1. Turn the igr 2. Check 40 A 3. Check cont terminal (2) Is the inspection YES $>>$ Per PO NO $>>$ Rep	2 inition switch ON a engine. ige between ABS acture electric unit (control unit) Terminal 2 n result normal? TO 7. TO 6. UATOR RELAY, ABS inition switch OFF. a fusible link (F). inuity and short circuit and 40 A fusible link (Dresult normal?) form trouble diagnosis WER SUPPLY - ". Dair or replace error-de	IN VALVE, AB t between ABS (F). s for battery po etected parts.	10 – 16 V ric unit (contro Voltage 10 – 16 V S OUT VALVE actuator and o	POWER SUPPLY CIRCUIT

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		
E34	3	Ground	Existed
E34	4	Ground	Existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8. CHECK TERMINAL

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

• Check IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >		[WITHOUT ESP]
STOP LAMP SWITCH		
Component Function Check		INFCID:00000006600978
1. CHECK STOP LAMP SWITCH OPERATION		
Depress brake pedal and check that stop lamp turns COFF.	DN, or release brake pedal and	I check stop lamp turns
Is the inspection result normal?		
YES >> GO TO 2. NO >> Check stop lamp system. Refer to <u>EXL-39.</u>	"Wiring Diagram".	
2. CHECK DATA MONITOR		
 With CONSULT-III. 1. Turn the ignition switch OFF to ON. 2. Select "ABS", "DATA MONITOR" and "STOP LAME displays "On" or "Off" when brake pedal is depress 		
<u>Is the inspection result normal?</u> YES >> INSPECTION END NO >> Proceed to BRC-67, "Diagnosis Procedure	n	
NO >> Proceed to <u>BRC-67. "Diagnosis Procedure</u> Diagnosis Procedure	-	
		INFOID:00000006600979
1.CHECK STOP LAMP SWITCH CLEARANCE		
 Turn the ignition switch OFF. Check stop lamp clearance. LHD: Refer to <u>BR-9</u>, "Inspection and Adjustment". RHD: Refer to <u>BR-77</u>, "Inspection and Adjustment" 		
Is the inspection result normal?		
YES >> GO TO 2. NO >> Adjust stop lamp switch clearance.		
 LHD: Refer to <u>BR-9, "Inspection and Adju</u> 		
RHD: Refer to <u>BR-77, "Inspection and Ac</u> 2.CHECK STOP LAMP SWITCH	<u>ijustment"</u> .	
Check stop lamp switch. Refer to <u>BRC-68</u> , "Component	t Inspection".	
Is the inspection result normal?		
YES >> GO TO 3. NO >> Repair or replace stop lamp switch.		
 LHD: Refer to <u>BR-21, "Removal and Insta</u> RHD: Refer to <u>BR-89, "Removal and Insta</u> 		
3. CHECK STOP LAMP SWITCH CIRCUIT (1)		
 Turn the ignition switch OFF. Disconnect ABS actuator and electric unit (control of 3. Check voltage between ABS actuator and electric of a section of the secti		ector and ground.
ABS actuator and electric unit (control unit)		Vala
	Condition	Voltage

Connector Terminal — Condition Voltage	
E34 8 Ground Brake pedal depressed 10 – 16 V	Ρ
Brake pedal not depressed Approx. 0 V	

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and ele	ectric unit (control unit)		Condition	Voltaga
Connector	Terminal		Condition	Voltage
E34 8 Grou		Ground	Brake pedal depressed	10 – 16 V
		Ground	Brake pedal not depressed	Approx. 0 V

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 4.

4.CHECK STOP LAMP SWITCH CIRCUIT (2)

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

ABS actuator and electric unit (control unit)		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E34	8	E118 ^{*1} M205 ^{*2}	2	Existed

*1: LHD

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

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal		Continuity	
E34	8	Ground	Not existed	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

- 1. Check 10 A fuse (#38).
- Check continuity and short circuit between stop lamp switch harness connector terminal (1) and 10 A fuse (#38).

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-10, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

6.CHECK TERMINAL

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

• Check stop lamp switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-</u> tion".

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:000000006600980

1.CHECK STOP LAMP SWITCH

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

^{*2:} RHD

STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Stop lamp switch	Condition	Continuity
Terminal	Condition	Continuity
1 – 2	When stop lamp switch is released (When brake pedal is depressed)	Existed
1 – 2	When stop lamp switch is pressed (When brake pedal is released)	Not existed
Is the inspection result n	ormal?	
 LHD: Refe 	N END top lamp switch. er to <u>BR-21, "Removal and Installatic</u> er to <u>BR-89, "Removal and Installatic</u>	

BRC

G

Н

J

Κ

L

M

Ν

Ο

Ρ

< DTC/CIRCUIT DIAGNOSIS >

PARKING BRAKE SWITCH

Component Function Check

1.CHECK PARKING BRAKE SWITCH OPERATION

Operate the parking brake lever. Then check that the brake warning lamp in the combination meter turns ON/ OFF correctly.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to <u>BRC-70, "Diagnosis Procedure"</u>.

Diagnosis Procedure

1. CHECK PARKING BRAKE SWITCH CIRCUIT

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

Parking b	rake switch	Combination meter		Continuity	
Connector	Terminal	Connector			
M31	1	M34	10	Existed	

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

Parking brake switch			Continuity	
Connector	Terminal		Continuity	
M31	1	Ground	Not existed	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK PARKING BRAKE SWITCH

Check the parking brake switch. Refer to <u>BRC-70, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace parking brake switch. Refer to <u>PB-5, "Removal and Installation"</u>.

3.CHECK COMBINATION METER

Check combination meter. Refer to MWI-23, "CONSULT-III Function".

Is the inspection result normal?

- YES >> Check each pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.
- NO >> Repair or replace combination meter. Refer to MWI-69, "Removal and Installation".

Component Inspection

1. CHECK PARKING BRAKE SWITCH

1. Turn the ignition switch OFF.

2. Disconnect parking brake switch harness connector.

3. Check continuity between parking brake switch harness connector.

INFOID:000000006600982

INFOID:000000006600983

INFOID:00000006600984

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT ESP]

Parking brake switch		Condition	Continuity	A
Terminal		When the parking brake switch is operated.	Existed	
1	Ground	When the parking brake switch is not operated.	Not existed	В
Is the inspection resul	t normal?			
YES >> INSPECT NO >> Replace p	ION END barking brake	switch. Refer to <u>PB-5, "Removal and Install</u>	ation".	С
				D
				Е
				BRC
				G
				Н
				I
				J
				К
				L
				Μ
				Ν
				0

Ρ

< DTC/CIRCUIT DIAGNOSIS >

BRAKE FLUID LEVEL SWITCH

Component Function Check

1.CHECK BRAKE FLUID LEVEL SWITCH OPERATION

When the brake fluid is full or empty. Then check that the brake warning lamp in the combination meter turns ON/OFF correctly.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to <u>BRC-72</u>, "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

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

Brake fluid level switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E42	1	M34	11	Existed

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

Brake fluid	level switch		Continuity
Connector	Terminal		
E42	1	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.check brake fluid level switch ground circuit

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

Brake fluid	level switch		Continuity
Connector	Terminal		
E42	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK BRAKE FLUID LEVEL SWITCH

Check brake fluid level switch. Refer to BRC-73, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.

- NO >> Replace reservoir tank.
 - LHD: Refer to <u>BR-44, "Disassembly and Assembly"</u>.
 - RHD: Refer to BR-109, "Disassembly and Assembly".

4.CHECK COMBINATION METER

Check combination meter. Refer to <u>MWI-23, "CONSULT-III Function"</u>. <u>Is the inspection result normal?</u>

BRC-72

INFOID:000000006600985

INFOID:000000006600986

BRAKE FLUID LEVEL SWITCH

[WITHOUT ESP] < DTC/CIRCUIT DIAGNOSIS > YES >> Check each pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts. А NO >> Repair or replace combination meter. Refer to MWI-69, "Removal and Installation". **Component Inspection** INFOID:000000006600987 В 1. CHECK BRAKE FLUID LEVEL SWITCH 1. Turn the ignition switch OFF. Disconnect brake fluid level switch harness connector. 2. Check continuity between brake fluid level switch harness connector. 3. D Brake fluid level switch Condition Continuity Terminal When brake fluid is full in the reservoir tank. Not existed Ε 1 - 2When brake fluid is empty in the reservoir tank. Existed Is the inspection result normal? BRC YES >> INSPECTION END NO >> Replace reservoir tank. • LHD: Refer to BR-44, "Disassembly and Assembly". • RHD: Refer to BR-109, "Disassembly and Assembly".

Н

Κ

L

Μ

Ν

Ρ

ABS WARNING LAMP

Component Function Check

1.CHECK ABS WARNING LAMP FUNCTION

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

CAUTION:

Never start engine.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to <u>BRC-74, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000006600991

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIR-CUIT

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-64, "Diagnosis Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.PERFORM SELF-DIAGNOSIS

(B) With CONSULT-III.

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-31, "DTC Index"</u>.

NO >> GO TO 3.

 ${f 3.}$ CHECK ABS WARNING LAMP SIGNAL

BWith CONSULT-III.

- 1. Select "ABS", "DATA MONITOR" and "ABS WARN LAMP" according to this order.
- 2. Turn the ignition switch OFF.
- 3. Check that data monitor displays "On" for approx. 1 second after ignition switch is turned ON and then changes to "Off".

CAUTION:

Never start engine.

Is the inspection result normal?

- YES >> Check combination meter. Refer to <u>MWI-23, "CONSULT-III Function"</u>.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>MWI-69. "Removal and Installa-</u> tion".

< DTC/CIRCUIT DIAGNOSIS >	[WITHOUT ESP]
BRAKE WARNING LAMP	
Component Function Check	INFOID:00000006600993
1. CHECK BRAKE WARNING LAMP FUNCTION (1)	
Check that brake warning lamp in combination meter turns ON for approx. 1 sect turned ON. CAUTION: Never start engine.	after ignition switch is
Is the inspection result normal?	
YES >> GO TO 2. NO >> Proceed to <u>BRC-70, "Diagnosis Procedure"</u> .	
2. CHECK BRAKE WARNING LAMP FUNCTION (2)	
Check that brake warning lamp in combination meter turns ON/OFF when parking b	rake is operated.
NOTE: Brake warning lamp turns ON when parking brake is operated (when parking brake <u>Is the inspection result normal?</u> YES >> GO TO 3.	switch is ON).
NO >> Check parking brake switch system. Refer to <u>BRC-70</u> , "Diagnosis Proce	edure".
3. CHECK BRAKE WARNING LAMP FUNCTION (3)	
Check that brake warning lamp in combination meter turns ON/OFF when brake flu while brake fluid level in reservoir tank is with the specified level. NOTE:	id level switch is operated
Brake warning lamp turns ON when brake fluid is less than the specified level (wher ON).	n brake fluid level switch is
Is the inspection result normal?	
YES >> INSPECTION END NO >> Check brake fluid level switch system. Refer to <u>BRC-70, "Diagnosis Pro</u>	ocedure".
Diagnosis Procedure	INFOID:00000006600994
1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUF CUIT	PPLY AND GROUND CIR-
Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power Refer to <u>BRC-64, "Diagnosis Procedure"</u> .	supply and ground circuit.
Is the inspection result normal?	
YES >> GO TO 2. NO >> Repair or replace error-detected parts.	
2. PERFORM THE SELF-DIAGNOSIS	
Perform self-diagnosis for "ABS". Is any DTC detected?	
YES >> Check the DTC. Refer to <u>BRC-31, "DTC Index"</u> . NO >> GO TO 3.	
3. CHECK COMBINATION METER	
Check combination meter. Refer to <u>MWI-23, "CONSULT-III Function"</u> .	
Is the inspection result normal?	
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u> tion".	0, "Removal and Installa-

EXCESSIVE OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS EXCESSIVE OPERATION FREQUENCY

Description

ABS function and EBD function operates in excessive operation frequency.

Diagnosis Procedure

1.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

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

2.CHECK FRONT AND REAR AXLE

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

- Front axle: Refer to <u>FAX-41, "Inspection"</u>.
- Rear axle: Refer to <u>RAX-4, "Inspection"</u>

Is the inspection result normal?

NO >> Repair or replace error-detected parts.

3.CHECK WHEEL SENSOR

Check wheel sensor.

- Check installation and damage of wheel sensor.
- Check connection of wheel sensor harness connector.
- Check terminal of wheel sensor harness connector.

Is the inspection result normal?

- YES >> GO TO 4. NO >> Repair o
 - >> Repair or replace wheel sensor.
 - Front wheel sensor: Refer to BRC-84, "FRONT WHEEL SENSOR : Removal and Installation".
 - Rear wheel sensor: Refer to BRC-86, "REAR WHEEL SENSOR : Removal and Installation".

4.CHECK SENSOR ROTOR

Check that there is no looseness, damage or foreign material on sensor rotor.

Is the inspection result normal?

- YES >> GO TO 5. NO >> Repair in
 - >> Repair installation or replace sensor rotor.
 - Front sensor rotor: Refer to BRC-88, "FRONT SENSOR ROTOR : Removal and Installation".
 - Rear sensor rotor. Refer to BRC-86, "REAR WHEEL SENSOR : Removal and Installation".

5.CHECK WARNING LAMP TURNS OFF

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

CAUTION:

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

Is the inspection result normal?

- YES >> Normal
- NO >> Perform self-diagnosis for "ABS" with CONSULT-III.

INFOID:000000006601247

INFOID:000000006601246

UNEXPECTED BRAKE PEDAL REACTION

	WITHOUT ESP]
< SYMPTOM DIAGNOSIS > [] UNEXPECTED BRAKE PEDAL REACTION	WITTOOT L3F]
Description	INFOID:000000006601248
A malfunction of brake pedal feel (height or others) is detected when brake pedal is depressed	ed.
Diagnosis Procedure	INFOID:000000006601249
1. CHECK FRONT AND REAR AXLE	
Check that there is no excessive looseness in front and rear axle.	
 Front axle: Refer to <u>FAX-41, "Inspection"</u>. 	
Rear axle: Refer to <u>RAX-4, "Inspection"</u> Is the inspection result normal?	
YES $>>$ GO TO 2.	
NO >> Repair or replace error-detected parts.	
2.CHECK DISC ROTOR	
Check disc rotor runout.	
 Front LHD: Refer to <u>BR-16, "DISC ROTOR : Inspection and Adjustment"</u>. 	
- RHD: Refer to BR-84, "DISC ROTOR : Inspection and Adjustment".	
 Rear LHD: Refer to <u>BR-18, "DISC ROTOR : Inspection and Adjustment"</u>. 	
- RHD: Refer to <u>BR-86, "DISC ROTOR : Inspection and Adjustment"</u> .	
Is the inspection result normal?	
YES >> GO TO 3. NO >> Refinish disc rotor.	
• Front	
 LHD: Refer to <u>BR-16, "DISC ROTOR : Inspection and Adjustment"</u>. RHD: Refer to <u>BR-84, "DISC ROTOR : Inspection and Adjustment"</u>. 	
Rear	
 LHD: Refer to <u>BR-18, "DISC ROTOR : Inspection and Adjustment"</u>. RHD: Refer to <u>BR-86, "DISC ROTOR : Inspection and Adjustment"</u>. 	
3. CHECK BRAKE FLUID LEACKAGE	
Check fluid leakage.	
• Front	
 LHD: Refer to <u>BR-30, "FRONT : Inspection"</u>. RHD: Refer to <u>BR-97, "FRONT : Inspection"</u>. 	
• Rear	
 LHD: Refer to <u>BR-39, "REAR : Inspection"</u>. RHD: Refer to <u>BR-105, "REAR : Inspection"</u>. 	
<u>Is the inspection result normal?</u>	
YES >> GO TO 4.	
NO >> Repair or replace error-detected parts.	
4.CHECK BRAKE PEDAL	
Check each item of brake pedal.	
 LHD: Refer to <u>BR-9, "Inspection and Adjustment"</u>. RHD: Refer to <u>BR-77, "Inspection and Adjustment"</u>. 	
Is the inspection result normal?	
YES >> GO TO 5.	
 NO >> Adjust each item of brake pedal. LHD: Refer to <u>BR-9, "Inspection and Adjustment"</u>. 	
RHD: Refer to <u>BR-77, "Inspection and Adjustment"</u> .	
5. CHECK BRAKING FORCE	

Check brake force using a brake tester.

< SYMPTOM DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check each components of brake system.

6.CHECK BRAKE PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector so that ABS does not operate. Check that brake force is normal in this condition. Connect harness connectors after checking.

Is the inspection result normal?

YES >> Normal

NO >> Check each components of brake system.

THE BRAKING DISTANCE IS LONG

SYMPTOM DIAGNOSIS >	[WITHOUT ESP]
HE BRAKING DISTANCE IS LONG	
escription	INFOID:0000000660125
ake stopping distance is long when ABS function is operated.	
agnosis Procedure	INFOID:0000000660125
AUTION:	
ake stopping distance on slippery road like rough road, gravel road or nger when ABS is operated than when ABS is not operated.	snowy road may become
CHECK BRAKING FORCE	
neck brake force using a brake tester.	
the inspection result normal? /ES >> GO TO 2.	
IO >> Check each components of brake system.	
CHECK BRAKE PERFORMANCE	
sconnect ABS actuator and electric unit (control unit) connector so that ABS doe	es not operate. Check brake
opping distance in this condition. Connect harness connectors after checking. the inspection result normal?	
´ES >> Normal	
IO >> Check each components of brake system.	

< SYMPTOM DIAGNOSIS >

DOES NOT OPERATE

Description

ABS function and EBD function does not operate.

Diagnosis Procedure

CAUTION:

ABS function and EBD function never operate when the vehicle speed is 10 km/h (6.2 MPH) or less.

1.CHECK ABS WARNING LAMP

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

CAUTION:

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

Is the inspection result normal?

YES >> Normal

NO >> Perform self-diagnosis for "ABS" with CONSULT-III.

INFOID:000000006601252

INFOID:000000006601253

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

А Description INFOID:000000006601254 Brake pedal vibrates and motor sound from ABS actuator and electric unit (control unit) occurs, when the В engine starts. Brake pedal vibrates during braking. **CAUTION:** Vibration may be felt during brake pedal is lightly depressed (just placing a foot on it) in the following conditions. This is normal. When shifting gears When driving on slippery road D During cornering at high speed When passing over bumps or grooves [Approx. 50 mm (1.97 in) or more] When pulling away just after starting engine [at approx. 10 km/h (6.2 MPH) or higher] Е **Diagnosis** Procedure INFOID:000000006601255 **1.**SYMPTOM CHECK 1 BRC Check that there are pedal vibrations when the engine is started. Do vibrations occur? YES >> GO TO 2. NO >> Check brake pedal. LHD: Refer to <u>BR-22</u>, "Inspection and Adjustment". RHD: Refer to <u>BR-90</u>, "Inspection and Adjustment". Н 2.SYMPTOM CHECK 2 Check that motor noise from ABS actuator and electric unit (control unit) occurs when the engine starts. Does the operation sound occur? YES >> GO TO 3. NO >> Perform self-diagnosis for "ABS" with CONSULT-III. 3. SYMPTOM CHECK 3 Check symptoms when electrical component (headlamps, etc.) switches are operated. Κ Does the symptom occur? YES >> Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit). L NO >> Normal

Μ

[WITHOUT ESP]

Ν

0

VEHICLE JERKS DURING

< SYMPTOM DIAGNOSIS >

VEHICLE JERKS DURING

Description

The vehicle jerks when ABS function and EBD function operates.

Diagnosis Procedure

1.CHECK SYMPTOM

Check that the vehicle jerks when ABS function and EBD function operates.

Is the inspection result normal?

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

2. PERFORM SELF-DIAGNOSIS

With CONSULT-III.

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-31, "DTC Index"</u>.

NO >> GO TO 3.

3.CHECK CONNECTOR

(B) With CONSULT-III.

- Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check connector terminal for deformation, disconnection and looseness.
- 4. Connect harness connector and perform self-diagnosis for "ABS" again.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Poor connection of connector terminal. Repair or replace connector terminal.

4.CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

With CONSULT-III.

Perform self-diagnosis for "ENGINE" and "TRANSMISSION" (for CVT models).

Is any DTC detected?

- YES >> Check the DTC.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-90, "Removal and Installa-</u> tion".

INFOID:000000006601256

INFOID:000000006601257

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

INFOID:000000006601260

Symptom	Result	
Brake pedal slightly vibrates and operation sound (motor sound and sound from suspen- sion) occurs when ABS function and EBD function operates.	This is not a malfunction, The symptom occurs ABS function and EBD function that are normally operated.	
Brake stopping distance may become longer than models without ABS function depending on the road conditions, when ABS function is operated on slippery road like rough road, gravel road or snowy road.		
Brake pedal vibrates and motor sound from the engine room occurs, when the engine starts or the vehicle starts just after starting the engine	This is not a malfunction. The symptom occurs during the brake fluid accumula- tion in the accumulator and operational check of the ABS actuator and electric unit (control unit).	

BRC

А

- G
- Н

J

Κ

L

Μ

Ν

Ο

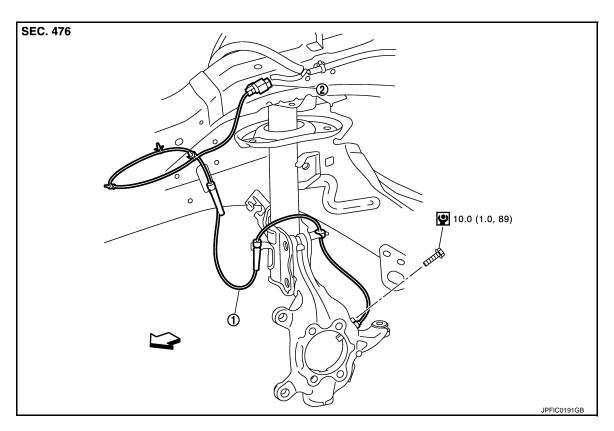
Ρ

< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:000000006383114



1. Front LH wheel sensor

2. Front LH wheel sensor harness connector

∵ Vehicle front

Let N·m (kg-m, in-lb)

NOTE:

Front RH wheel sensor is symmetrically opposite of LH.

FRONT WHEEL SENSOR : Removal and Installation

INFOID:000000006383115

REMOVAL

- 1. Remove tires.
- 2. Remove the fender protector (front). Refer to EXT-22, "Removal and Installation".
- Remove front wheel sensor from steering knuckle.
 CAUTION:
 Never rotate and never null front wheel sensor a

Never rotate and never pull front wheel sensor as much as possible, when pulling out.

 Remove front wheel sensor harness from the vehicle.
 CAUTION: Never twist or pull front wheel sensor harness, when removing.

INSTALLATION

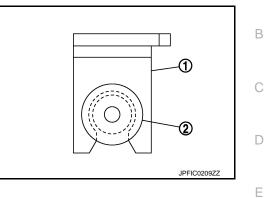
Note the following, and install in the reverse order of the removal.

WHEEL SENSOR

< REMOVAL AND INSTALLATION >

[WITHOUT ESP]

- · Check that there is no foreign material like iron powder or damage on inner surface of front wheel sensor mounting hole of steering knuckle and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.
- Never twist front wheel sensor harness when installing front wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that front wheel sensor harness is not twisted after installation.

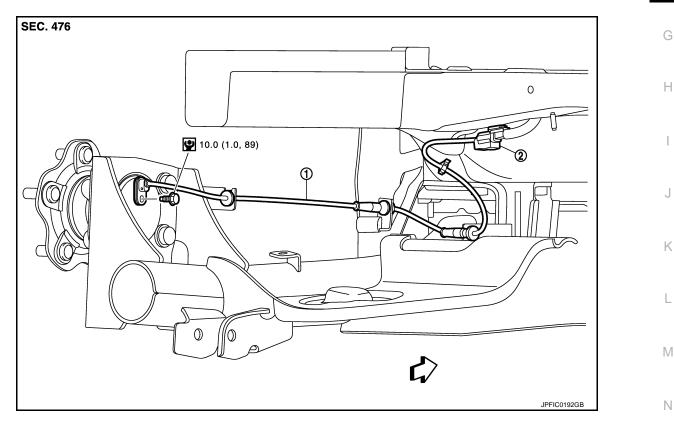


REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:000000006383116

LEFT SIDE



- Rear LH wheel sensor 1.
- 2. Rear LH wheel sensor harness connector

<: : Vehicle front

L: N·m (kg-m, in-lb)

RIGHT SIDE

BRC

А

BRC-85

Ρ

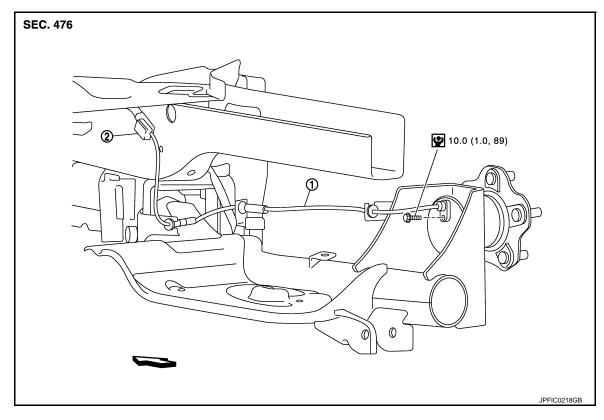
Κ

L

WHEEL SENSOR

< REMOVAL AND INSTALLATION >

INFOID:000000006383117



1. Rear RH wheel sensor

2. Rear RH wheel sensor harness connector

∠: Vehicle front

P: N⋅m (kg-m, in-lb)

REAR WHEEL SENSOR : Removal and Installation

REMOVAL

1. Remove rear wheel sensor from wheel hub and bearing assembly. CAUTION:

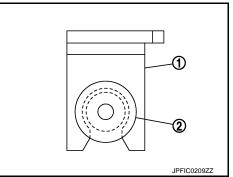
Never rotate or pull rear wheel sensor as much as possible, when pulling out.

 Remove rear wheel sensor harness from the vehicle.
 CAUTION: Never twist and never pull rear wheel sensor harness, when removing.

INSTALLATION

Note the following, and install in the reverse order of the removal.

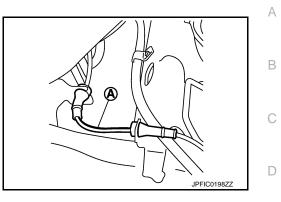
- Check that there is no foreign material like iron powder or damage on inner surface of rear wheel sensor mounting hole of wheel hub and bearing assembly and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.
- Never twist rear wheel sensor harness when installing rear wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that rear wheel sensor harness is not twisted after installation.



< REMOVAL AND INSTALLATION >

CAUTION:

Check that the identification line (A) of the rear wheel sensor is faced upward.



BRC

Е



G

Н

J

Κ

L

Μ

Ν

Ο

Ρ

< REMOVAL AND INSTALLATION >

SENSOR ROTOR FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Removal and Installation

INFOID:000000006383118

[WITHOUT ESP]

REMOVAL

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to FAX-43. "Removal and Installation".

INSTALLATION

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to FAX-43. "Removal and Installation".

REAR SENSOR ROTOR

REAR SENSOR ROTOR : Removal and Installation

INFOID:000000006383119

REMOVAL

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to <u>RAX-5, "Removal and Installation"</u>.

INSTALLATION

Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to RAX-5, "Removal and Installation".

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [WITHOUT ESP] < REMOVAL AND INSTALLATION >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

LHD

INFOID:000000006383120

А

В

С

D

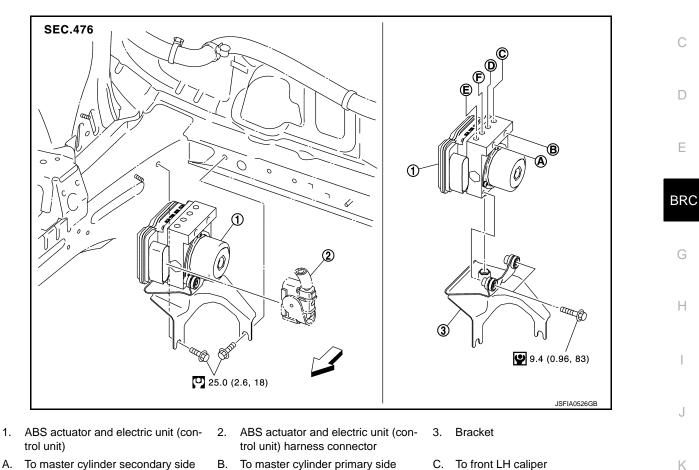
Е

Н

J

Κ

L



E. To rear LH caliper

- D. To rear RH caliper
- : Vehicle front
- N·m (kg-m, ft-lb)

E: N·m (kg-m, in-lb)

RHD

To front RH caliper

F.

Μ

Ν

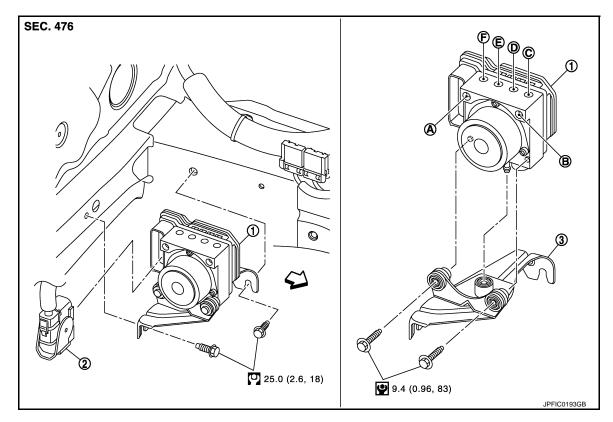
Ο

Ρ

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< REMOVAL AND INSTALLATION >

[WITHOUT ESP]



- 1. ABS actuator and electric unit (control unit)
- A. To master cylinder secondary side
- D. To rear RH caliper
- B. To master cylinder primary side

E. To rear LH caliper

2. ABS actuator and electric unit (con-

trol unit) harness connector

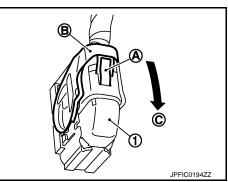
- 3. Bracket
- C. To front LH caliper
- F. To front RH caliper

- <: Vehicle front
- : N·m (kg-m, ft-lb)
- L: N·m (kg-m, in-lb)

Removal and Installation

REMOVAL

- 1. Disconnect battery cable from negative terminal.
- 2. Drain brake fluid.
 - LHD: Refer to <u>BR-12, "Draining"</u>.
 - RHD: Refer to BR-80, "Draining".
- Remove air cleaner case and air duct. (RHD) Refer to <u>EM-161, "Removal and Installation"</u>.
- 4. Disconnect ABS actuator and electric unit (control unit) harness connector (1), follow the procedure described below.
- a. Push the pawl (A).
- b. Move the lever (B) in the direction (C) until locked.
- Disconnect ABS actuator and electric unit (control unit) harness c. connector.
- Loosen flare nut of brake tube using a flare nut wrench, and then 5. remove brake tube from ABS actuator and electric unit (control unit).
 - LHD Refer to <u>BR-24, "FRONT : Exploded View"</u>.
 - RHD Refer to BR-91, "FRONT : Exploded View".
- Remove ABS actuator and electric unit (control unit) and bracket. 6. **CAUTION:**



INFOID:00000006383121

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

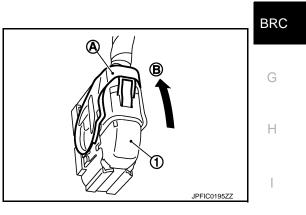
< REMOVAL AND INSTALLATION >

- Never remove and never install ABS actuator and electric unit (control unit) by holding harness connector.
- Be careful not to drop ABS actuator and electric unit (control unit) and apply excessive impact to it.
- 7. Remove bracket and bushing from ABS actuator and electric unit (control unit).

INSTALLATION

Note the following, and install in the reverse order of removal.

- When replacing with a new ABS actuator and electric unit (control unit), never remove the protector of the C brake tube mounting hole until right before the brake tube is installed.
- When installing brake tube, tighten to the specified torque using a flare nut torque wrench so that flare nut and brake tube are not damaged.
- LHD: Refer to <u>BR-24, "FRONT : Exploded View"</u>.
- RHD: Refer to BR-91, "FRONT : Exploded View".
- Never remove and install ABS actuator and electric unit (control unit) by holding actuator harness.
- Bleed air from brake piping after installation.
- LHD: Refer to <u>BR-13</u>, "Bleeding Brake System".
- RHD: Refer to BR-81, "Bleeding Brake System".
- Never apply excessive impact to actuator, such as by dropping it.
- After installing the ABS actuator and electric unit (control unit) harness connector (1), move the lever (A) in the direction (B) to secure the locking.



[WITHOUT ESP]

А

В

D

Е

Κ

L

Μ

Ν

Ρ

< HOW TO USE THIS MANUAL >

HOW TO USE THIS MANUAL HOW TO USE THIS SECTION

Information

Both "VDC" and "ESP" are used in this manual. These indicate the same system.

[WITH ESP]

INFOID:000000006635247

А

В

E

Н

Ν

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" INFOID:000000006601860

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 "SRS AIR BAG" and "SEAT BELT" of this Service Manual. D

The vehicle may be equipped with a passenger air bag deactivation switch. Because no rear seat exists where a rear-facing child restraint can be placed, the switch is designed to turn off the passenger air bag so that a rear-facing child restraint can be used in the front passenger seat. The switch is located in the center of the instrument panel, near the ashtray. When the switch is turned to the ON position, the passenger air bag is enabled and could inflate for certain types of collision. When the switch is turned to the OFF position, the passenger air bag is disabled and will not inflate. A passenger air bag OFF indicator on the instrument panel lights BRC up when the passenger air bag is switched OFF. The driver air bag always remains enabled and is not affected by the passenger air bag deactivation switch.

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 "SRS AIR BAG".
- 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 vellow and/or orange harnesses or harness connectors.
- The vehicle may be equipped with a passenger air bag deactivation switch which can be operated by the customer. When the passenger air bag is switched OFF, the passenger air bag is disabled and will not inflate. When the passenger air bag is switched ON, the passenger air bag is enabled and could inflate for certain types of collision. After SRS maintenance or repair, make sure the passenger Κ air bag deactivation switch is in the same position (ON or OFF) as when the vehicle arrived for service.

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

WARNING:

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

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:000000006601861

NOTE:

- Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.
- Ρ After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

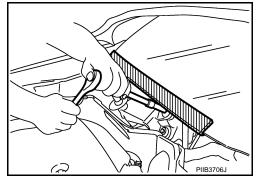
- 1. Connect both battery cables. NOTE: Supply power using jumper cables if battery is discharged.
- 2. Turn the ignition switch to ACC position. (At this time, the steering lock will be released.)
- Disconnect both battery cables. The steering lock will remain released with both battery cables discon-3. nected and the steering wheel can be turned.
- Perform the necessary repair operation. 4.
- When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn 5. the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
- 6. Perform self-diagnosis check of all control units using CONSULT-III.

Precaution for Procedure without Cowl Top Cover

INFOID:000000006601862

INFOID:000000006601863

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



Precaution for Brake System

WARNING:

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

- Brake fluid use refer to <u>MA-13</u>, "Fluids and Lubricants".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Never use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with a flare nut torque wrench (A).
- 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.

JPFIA0061Z

INFOID:00000006601864

Always perform a pre-driving check to drive the vehicle.

Precaution for Brake Control system

• Always check speed and safety while driving the vehicle.

PRECAUTIONS

< PRECAUTION >

[WITH ESP]

В

D

Е

Н

•	To operate CONSULT-III while driving, more than one person is required to be in the vehicle to avoid interfer-	
	ence to driving and ensure safety.	А
•	Slight vibrations are felt on the brake pedal and the operation noises occur, when ESP function, TCS func-	
	tion, ABS function EBD function or brake limited slip differential (BLSD) function operates. This is not a mal-	

- function because it is caused by ESP function, TCS function, ABS function EBD function or brake limited slip differential (BLSD) function that is normally operated.
 When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor.
- When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is normal condition.
- Brake stopping distance may become longer than models without ABS function depending on the road conditions, when ABS function is operated on slippery road like rough road, gravel road or snowy road.
- When a malfunction is indicated, always collect information from the customer about conditions of occurrence, estimate cause and perform operation. Check brake booster operation, brake fluid level and brake fluid leakage, as well as electrical system.
- The optimum performance is achieved by control for ESP function, TCS function, ABS function EBD function and brake limited slip differential (BLSD) function when all of brakes, suspensions and tires installed on the vehicle are the specified size and parts. Brake performance and controllability may be negatively affected when other parts than the specified are installed.
- Brake stopping distance may become longer and steering stability may be negatively affected, when tires in different size and combination or other parts than the specified are used.
- When a radio (including wiring), antenna and antenna lead line are located near ABS actuator and electric unit (control unit), a malfunction or improper operation may occur for the control of ESP function, TCS function, ABS function EBD function and brake limited slip differential (BLSD) function.
- When the following items are replaced by other parts than genuine parts or modified, ABS warning lamp, brake warning lamp and ESP warning lamp may turn ON, and the control may not operate normally for ESP function, TCS function, ABS function EBD function and brake limited slip differential (BLSD) function.
- Suspension component parts (shock absorber, spring, bushing and others)
- Tire and wheel (other than the specified size)
- Brake component parts (brake pad, disc rotor, brake caliper and others)
- Engine component parts (ECM, muffler and others)
- Body reinforcement component parts (rollover bar, tower bar and others)
- When suspension, tire and brake component parts are excessively worn or deteriorated and the vehicle is driven, ABS warning lamp, brake warning lamp and ESP warning lamp may turn ON, and the control may not operate normally for ESP function, TCS function, ABS function EBD function and brake limited slip differential (BLSD) function.
- ABS warning lamp, brake warning lamp and ESP warning lamp may turn ON, when only front wheel or rear wheel is rotated using a free roller. This is not a malfunction, because it is caused by wheel speed difference between wheel that is rotated and wheel that is not rotated. In this case, perform self-diagnosis, check selfdiagnosis results, and erase memory.
- When power supply voltage is not normal, ABS warning lamp, brake warning lamp and ESP warning lamp turn ON. ABS actuator and electric unit (control unit) stops control for ESP function, TCS function, ABS function EBD function and brake limited slip differential (BLSD) function. Ordinary brake operates. After power supply returns to normal, ABS warning lamp, brake warning lamp and ESP warning lamp turn OFF. The control becomes operative for ESP function, TCS function, ABS function, ABS function EBD function and brake limited slip differential (BLSD) function EBD function and brake limited slip differential (BLSD) function.
- Brake pedal vibrates and operation sound occurs during sudden acceleration and cornering, when ESP function, TCS function or brake limited slip differential (BLSD) function is operated. This is not a malfunction because it is caused by ESP function, TCS function or brake limited slip differential (BLSD) function that is N operated normally.
- ESP warning lamp may turn ON and ESP function, TCS function and brake limited slip differential (BLSD) function may not normally operate, when driving on a special road the is extremely slanted (bank in a circuit course). This is not a malfunction if the status returns to normal for ESP function, TCS function and brake limited slip differential (BLSD) function after the engine is started again. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory.
- A malfunction in yaw rate/side/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while ESP function, TCS function and brake limited slip differential (BLSD) function are OFF (ESP OFF switch is pressed and ESP OFF indicator lamp is in ON status). This is not a malfunction if the status returns to normal for ESP function, TCS function and brake limited slip differential (BLSD) function after the engine is started again. In this case, perform self-diagnosis, check self-diagnosis results, and erase memory.

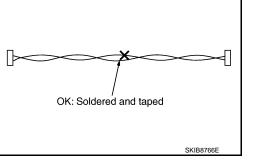
PRECAUTIONS

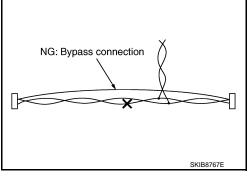
Precaution for Harness Repair

< PRECAUTION >

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

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



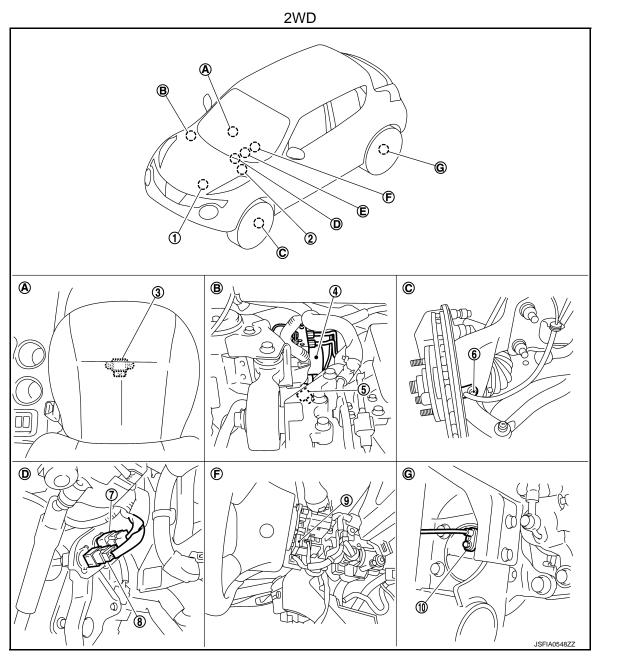


< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION **COMPONENT PARTS**

Component Parts Location

LHD



- 1. ECM Refer to EC-25, "ENGINE CON-TROL SYSTEM : Component Parts Location" (MR16DDT), EC-455, "ENGINE CONTROL SYSTEM : Component Parts Location" (HR16DE), <u>EC-813</u>, "Component Parts Location" (K9K).
- 2. TCM*1 Refer to TM-314, "CVT CONTROL SYSTEM : Component Parts Location".
- 3. Yaw rate/side/decel G sensor
- Ρ

0



- ABS actuator and electric unit (con- 5. ESP pressure sensor*2 4. trol unit)

BRC-97

6. Front wheel sensor INFOID:000000006601865

А

В

С

D

Е

BRC

Н

J

Κ

L

Μ

Ν

< SYSTEM DESCRIPTION >

- 7. Stop lamp switch
- 8. Brake switch/brake pedal position 9. switch

. Steering angle sensor

Steering knuckle

- 10. Rear wheel sensor
- A. Under floor carpet (front seat right side)
- D. Brake pedal

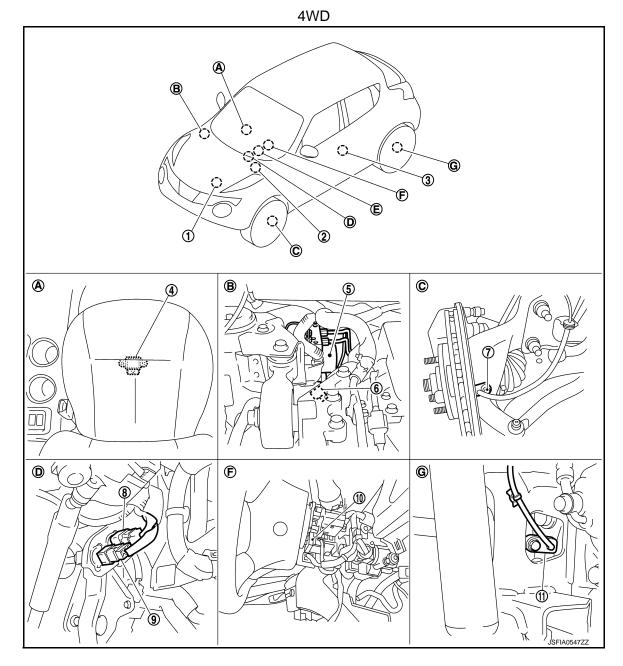
B. Inside engine room
C.
E. ABS warning lamp, brake warning lamp, ESP warning lamp, ESP OFF indicator lamp (in combination

meter)

Back of spiral cable assembly

[WITH ESP]

- G. Rear wheel hub and bearing assembly
- *1: Models with CVT
- *2: Models with HR16DE and MR16DDT



indicator lamp (in combination

meter)

< SYSTEM DESCRIPTION >

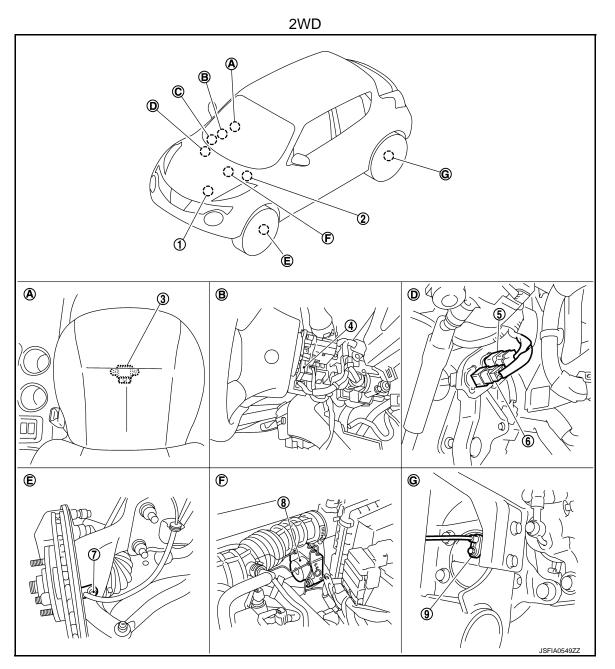
[WITH ESP]

- 1. ECM Refer to EC-25, "ENGINE CON-<u>TROL SYSTEM :</u> <u>Component Parts Location"</u>.
- 4. Yaw rate/side/decel G sensor
- 7. Front wheel sensor
- 10. Steering angle sensor
- A. Under floor carpet (front seat right side)
- D. Brake pedal

G. Rear axle housing

2. TCM 3. 4WD control module Refer to TM-131, "CVT CONTROL Refer to DLN-10, "Component Parts SYSTEM : Component Parts Loca-Location". tion". ABS actuator and electric unit (con-5. 6. ESP pressure sensor trol unit) Stop lamp switch 9. Brake switch/brake pedal position 8. switch 11. Rear wheel sensor В. Inside engine room C. Steering knuckle Ε. ABS warning lamp, brake warning F. Back of spiral cable assembly lamp, ESP warning lamp, ESP OFF

RHD



BRC-99

BRC

Н

Κ

L

Μ

Ν

0

Ρ

А

В

С

D

Е

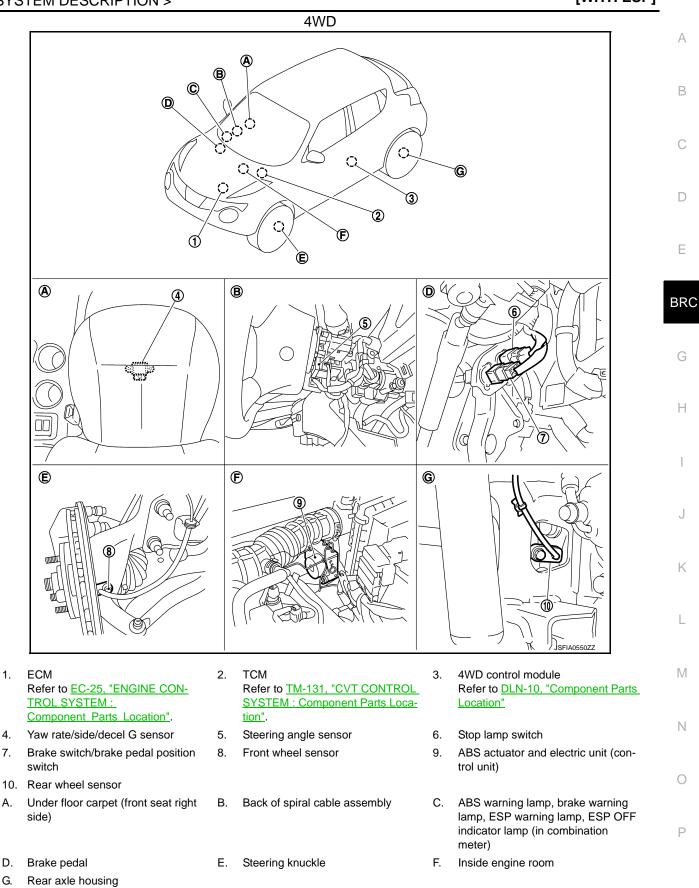
< SYSTEM DESCRIPTION >

1.	ECM Refer to EC-25. "ENGINE CON- TROL SYSTEM : Component Parts Location" (MR16DDT), EC-455. "ENGINE CONTROL SYSTEM : Component Parts Location" (HR16DE), EC-813. "Component Parts Location" (K9K).	2.	TCM [*] Refer to <u>TM-314, "CVT CONTROL</u> <u>SYSTEM : Component Parts Loca-</u> tion".	3.	Yaw rate/side/decel G sensor
4.	Steering angle sensor	5.	Stop lamp switch	6.	Brake switch/brake pedal position switch
7.	Front wheel sensor	8.	ABS actuator and electric unit (con- trol unit)	9.	Rear wheel sensor
A.	Under floor carpet (front seat right side)	B.	Back of spiral cable assembly	C.	ABS warning lamp, brake warning lamp, ESP warning lamp, ESP OFF indicator lamp (in combination meter)
D. G.	Brake pedal Rear wheel hub and bearing assem- bly	E.	Steering knuckle	F.	Inside engine room

*: Models with CVT

< SYSTEM DESCRIPTION >

[WITH ESP]



< SYSTEM DESCRIPTION >

Component Description

INFOID:000000006601866

Component	Reference/Function	
ABS actuator and electric unit (control unit)	BRC-103, "ABS Actuator and Electric Unit (Control Unit)"	
Wheel sensor	BRC-102, "Wheel Sensor and Sensor Rotor"	
ESP pressure sensor ^{*1}	BRC-104, "ESP pressure Sensor"	
Stop lamp switch	BRC-104, "Stop Lamp Switch"	
Brake switch/brake pedal position switch	BRC-104, "Brake Switch/Brake Pedal Position Switch"	
Steering angle sensor	BRC-104, "Steering Angle Sensor"	
Yaw rate/side/decel G sensor	BRC-104, "Yaw Rate/Side/Decel G Sensor"	
ESP OFF switch	BRC-104, "ESP OFF Switch"	
Brake fluid level switch	BRC-104, "Brake Fluid Level Switch"	
Parking brake switch	BRC-104, "Parking Brake Switch"	
ESP warning lamp		
ABS warning lamp		
Brake warning lamp	BRC-105, "System Description"	
ESP OFF indicator lamp		
ECM	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal 	
TCM*2	Mainly transmits the following signals to ABS actuator and elec- tric unit (control unit) via CAN communication. • N range signal • P range signal • R range signal • Current gear position signal	
4WD control module ^{*3}	Mainly transmits the following signals to ABS actuator and elec- tric unit (control unit) via CAN communication. • Current 4WD mode signal	

*1: Models with LHD (MR16DDT and HR16DE)

*2: Models with CVT

*3: 4WD models

Wheel Sensor and Sensor Rotor

NOTE:

- Wheel sensor of front wheel is installed on steering knuckle.
- Sensor rotor of front wheel is integrated in wheel hub and bearing assembly.
- Wheel sensor of rear wheel is installed on wheel hub and bearing assembly. (2WD)
- Wheel sensor of rear wheel is installed on axle housing. (4WD)
- Sensor rotor of rear wheel is integrated in wheel hub and bearing assembly. (2WD)
- Sensor rotor of rear wheel is integrated on drive shaft. (4WD)
- Never measure resistance and voltage value using a tester because sensor is active sensor.

BRC-102

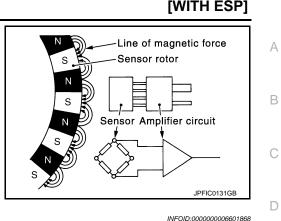
INFOID:000000006601867

[WITH ESP]

< SYSTEM DESCRIPTION >

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.



Е

BRC

Н

Κ

M

Ρ

ABS Actuator and Electric Unit (Control Unit)

Electric unit (control unit) is integrated with actuator and comprehensively controls ESP function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function.

ELECTRIC UNIT (CONTROL UNIT)

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

ACTUATOR

The following components are integrated with ABS actuator.

Pump

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

Motor

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

Motor Relay

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

Actuator Relay (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.

NOTE:

Valve is a solenoid valve.

ABS OUT Valve

Switches the fluid pressure line to increase, hold or decrease according to signals from control unit. NOTE:

Valve is a solenoid valve.

Cut Valve 1. Cut Valve2

Shuts off the ordinary brake line from master cylinder, when ESP function, TCS function and brake limited slip differential (BLSD) function are activated.

Suction Valve 1, Suction Valve 2

Ν Supplies the brake fluid from master cylinder to the pump, when ESP function, TCS function and brake limited slip differential (BLSD) function are activated.

Inlet Valve

Brake fluid sucked from the reservoir by the pump does not backflow. NOTE: Valve is a check valve.

Outlet Valve

Brake fluid discharged from the pump does not backflow.

NOTE:

Valve is a check valve.

Return Check Valve Returns the brake fluid from brake caliper to master cylinder by bypassing orifice of each valve when brake is released.

< SYSTEM DESCRIPTION >

Reservoir

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

ESP pressure Sensor

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

Stop Lamp Switch

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

Brake Switch/Brake Pedal Position Switch

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

Steering Angle Sensor

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

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

Yaw Rate/Side/Decel G Sensor

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

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

ESP OFF Switch

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

Brake limited slip differential (BLSD) function control operates.

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

Brake Fluid Level Switch

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

Parking Brake Switch

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

INFOID:000000006385694

INFOID:000000006601869

INFOID:000000006605577

INFOID:000000006385691

INFOID:000000006385692

INFOID:000000006385696

INFOID:000000006385693

INFOID:00000006385695

SYSTEM

< SYSTEM DESCRIPTION >

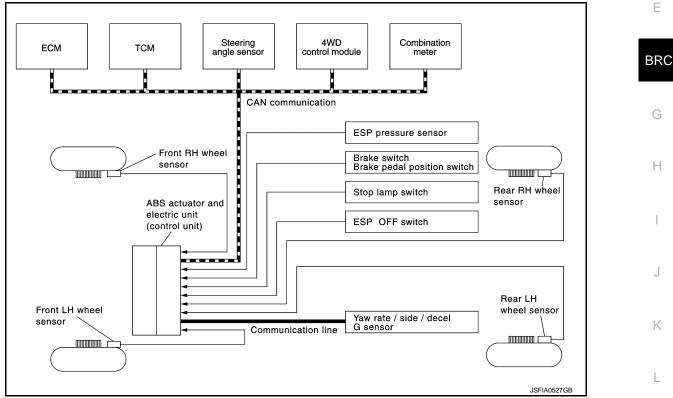
SYSTEM

System Description

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

SYSTEM DIAGRAM NOTE:

- ESP pressure sensor is LHD models (MR16DDT and HR16DE) only.
- TCM is CVT models only.
- 4WD control module is 4WD models only.



INPUT SIGNAL AND OUTPUT SIGNAL

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

Ν

Μ

Κ

L

Ρ

INFOID:000000006601870

А

В

С

D

Е

Н

< SYSTEM DESCRIPTION >

ESP function, TCS function, ABS function	, EBD function, Brake limited slip differential (BLSD) function		
Component	Signal description		
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.Steering angle sensor signal		
Yaw rate/side/decel G sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line^{*1} Yaw rate signal Side G sensor signal Decel G sensor signal 		
ECM	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal 		
TCM ^{*2}	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. N range signal P range signal R range signal Current gear position signal 		
4WD control module ^{*3}	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.Current 4WD mode signal		
Combination meter	 Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Brake fluid level switch signal ABS warning lamp signal Brake warning lamp signal ESP warning lamp signal ESP OFF indicator lamp signal 		

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

*2: Models with CVT

*3: 4WD models

VALVE OPERATION [ESP FUNCTION, TCS FUNCTION AND BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION

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

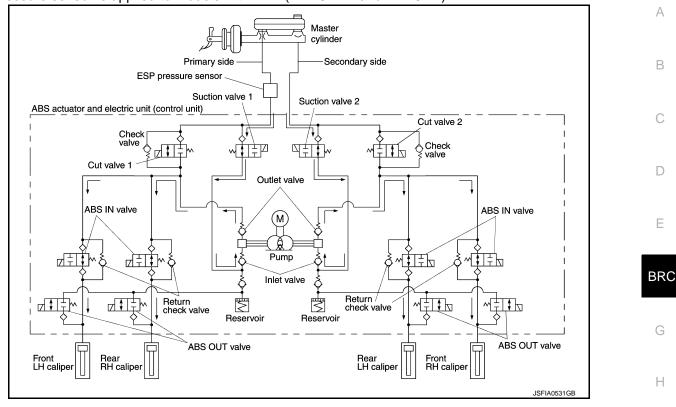
When ESP Function, TSC Function and Brake Limited Slip Differential (BLSD) Function is in Operation (During Pressure Increases)

NOTE:

SYSTEM

< SYSTEM DESCRIPTION >

ESP pressure sensor is applied to models with LHD (MR16DDT and HR16DE).



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

During pressure front RH brake caliper increases

• Brake fluid is conveyed to the pump from the master cylinder through suction valve 2 and is pressurized by the pump operation. The pressurized brake fluid is supplied to the front RH brake caliper through the ABS IN valve. For the left caliper, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure front LH brake caliper increases

 Brake fluid is conveyed to the pump from the master cylinder through suction valve 1 and is pressurized by the pump operation. The pressurized brake fluid is supplied to the front LH brake caliper through the ABS IN valve. For the right caliper, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the right caliper is controlled separately from the left caliper.

During pressure rear RH brake caliper increases

 Brake fluid is conveyed to the pump from the master cylinder through suction valve 1 and is pressurized by the pump operation. The pressurized brake fluid is supplied to the rear RH brake caliper through the ABS IN valve. For the left caliper, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure rear LH brake caliper increases

 Brake fluid is conveyed to the pump from the master cylinder through suction valve 2 and is pressurized by the pump operation. The pressurized brake fluid is supplied to the rear LH brake caliper through the ABS IN

BRC-107

Ν

Κ

L

Μ

SYSTEM

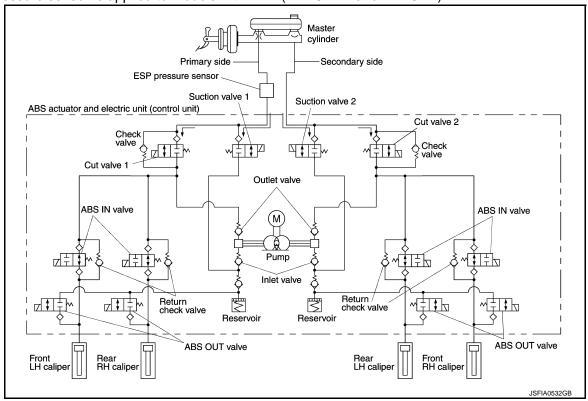
< SYSTEM DESCRIPTION >

valve. For the right caliper, brake fluid pressure is maintained because the pressurization is unnecessary. The pressurization for the right caliper is controlled separately from the left caliper.

When ESP Function, TSC Function and Brake Limited Slip Differential (BLSD) Function is Starts Operating (During Pressure Holds)

NOTE:

ESP pressure sensor is applied to models with LHD (MR16DDT and HR16DE).



Name	Not activated	During pressure holds
Cut valve 1	Power supply is not supplied (open)	Power supply is supplied (close)
Cut valve 2	Power supply is not supplied (open)	Power supply is supplied (close)
Suction valve 1	Power supply is not supplied (close)	Power supply is 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 (fluid pressure)	_	Pressure holds

During pressure front RH brake caliper holds

Since the cut valve 2 and the suction valve 2 are closed, the front RH brake caliper, master cylinder, and reservoir are blocked. This maintains fluid pressure applied on the front RH brake caliper. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure front LH brake caliper holds

Since the cut valve 1 and the suction valve 1 are closed, the front LH brake caliper, master cylinder, and reservoir are blocked. This maintains fluid pressure applied on the front LH brake caliper. The pressurization for the right caliper is controlled separately from the left caliper.

During pressure rear RH brake caliper holds

• Since the cut valve 1 and the suction valve 1 are closed, the rear RH brake caliper, master cylinder, and reservoir are blocked. This maintains fluid pressure applied on the rear RH brake caliper. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure rear LH brake caliper holds

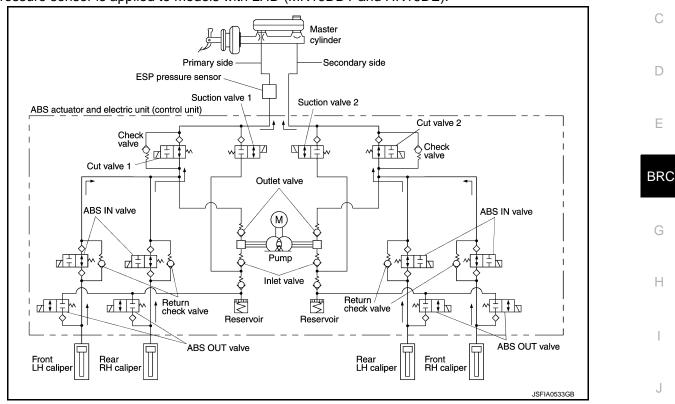
< SYSTEM DESCRIPTION >

 Since the cut valve 2 and the suction valve 2 are closed, the rear LH brake caliper, master cylinder, and reservoir are blocked. This maintains fluid pressure applied on the rear LH brake caliper. The pressurization for the right caliper is controlled separately from the left caliper.

When ESP Function, TSC Function and Brake Limited Slip Differential (BLSD) Function is in Operation (During Pressure Decreases)

NOTE:

ESP pressure sensor is applied to models with LHD (MR16DDT and HR16DE).



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 not supplied (open)	-
ABS OUT valve	Power supply is not supplied (close)	Power supply is not supplied (close)	-
Each brake caliper (fluid pressure)		Pressure decreases	-

During pressure front RH brake caliper decreases

• Since the suction valve 2 and the ABS OUT valve close and the cut valve 2 and the ABS IN valve open, the fluid pressure applied on the front RH brake caliper is reduced by supplying the fluid pressure to the master cylinder via the ABS IN valve and the cut valve 2. The pressurization for the right caliper is controlled separately from the left caliper.

During pressure front LH brake caliper decreases

• Since the suction valve 1 and the ABS OUT valve close and the cut valve 1 and the ABS IN valve open, the fluid pressure applied on the front LH brake caliper is reduced by supplying the fluid pressure to the master cylinder via the ABS IN valve and the cut valve 2. The pressurization for the left caliper is controlled separately from the right caliper.

During pressure rear RH brake caliper decreases

• Since the suction value 1 and the ABS OUT value close and the cut value 1 and the ABS IN value open, the fluid pressure applied on the rear RH brake caliper is reduced by supplying the fluid pressure to the master

А

В

Ν

Ρ

< SYSTEM DESCRIPTION >

cylinder via the ABS IN valve and the cut valve 2. The pressurization for the right caliper is controlled separately from the left caliper.

During pressure rear LH brake caliper decreases

• Since the suction valve 2 and the ABS OUT valve close and the cut valve 2 and the ABS IN valve open, the fluid pressure applied on the rear LH brake caliper is reduced by supplying the fluid pressure to the master cylinder via the ABS IN valve and the cut valve 2. The pressurization for the left caliper is controlled separately from the right caliper.

Component Parts and Function

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).
Cut valve 1 Cut valve 2	Shuts off the ordinary brake line from master cylinder.
Suction valve 1 Suction valve 2	Supplies the brake fluid from master cylinder to the pump.
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.
Inlet valve	Brake fluid sucked from the reservoir by the pump does not backflow.
Outlet valve	Brake fluid discharged from the pump does not backflow.
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 decreas- es when decreasing pressure of brake caliper and wheel cylinder.
ESP pressure sensor	Detects the brake fluid pressure and transmits signal to ABS actuator and electric unit (control unit).

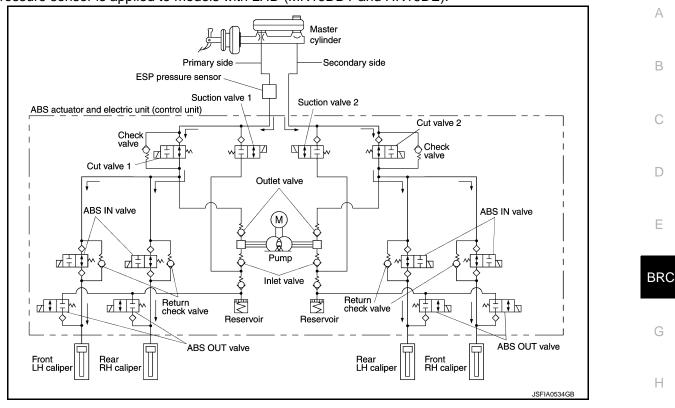
VALVE OPERATION (ABS FUNCTION AND EBD FUNCTION)

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

When Brake Pedal is Applied or ABS Function is in Operation (During Pressure Increases) **NOTE:**

< SYSTEM DESCRIPTION >

ESP pressure sensor is applied to models with LHD (MR16DDT and HR16DE).



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 (fluid pressure)		Pressure increases	•

During pressure front RH brake caliper increases

 When the cut valve 2 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.

During pressure front LH brake caliper increases

 When the cut valve 1 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.

During pressure rear RH brake caliper increases

• When the cut valve 1 and the ABS IN valve opens, brake fluid is supplied to the rear 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.

During pressure rear LH brake caliper increases

 When the cut valve 2 and the ABS IN valve opens, brake fluid is supplied to the rear 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.

When ABS Function is Starts Operating (During Pressure Holds) **NOTE:**

BRC-111

Ο

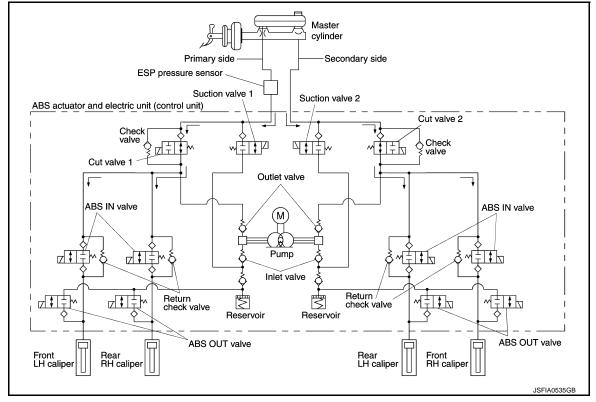
Ρ

L

Μ

< SYSTEM DESCRIPTION >

ESP pressure sensor is applied to models with LHD (MR16DDT and HR16DE).



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 (fluid pressure)		Pressure holds

During pressure front RH brake caliper holds

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.

During pressure front LH brake caliper holds

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.

During pressure rear RH brake caliper holds

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

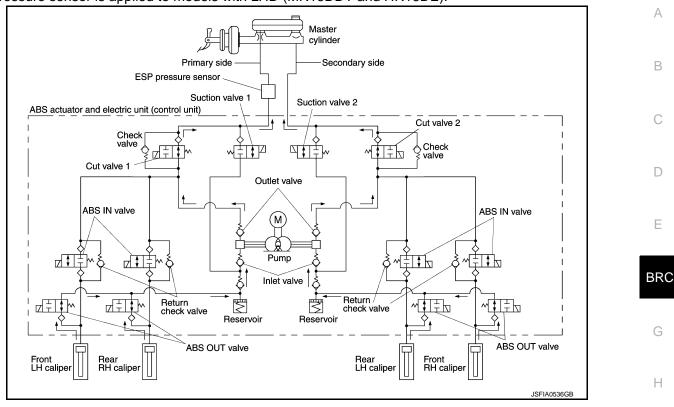
During pressure rear LH brake caliper holds

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

When ABS Function is in Operation (During Pressure Decreases) **NOTE:**

< SYSTEM DESCRIPTION >

ESP pressure sensor is applied to models with LHD (MR16DDT and HR16DE).



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 (fluid pressure)		Pressure decreases	-

During pressure front RH brake caliper decreases

• 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.

During pressure front LH brake caliper decreases

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

During pressure rear RH brake caliper decreases

• Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the rear 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.

During pressure rear LH brake caliper decreases

• Since the ABS IN valve is closed and the ABS OUT valve is opened, fluid pressure applied on the rear 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.

When ABS Function is in Operation (During Pressure Increases) **NOTE:**

BRC-113

0

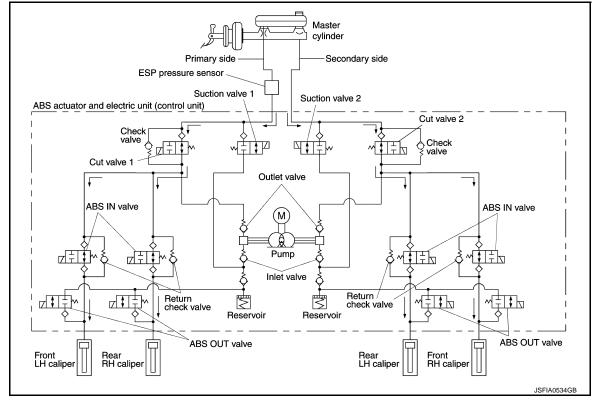
Ρ

L

Μ

< SYSTEM DESCRIPTION >

ESP pressure sensor is applied to models with LHD (MR16DDT and HR16DE).



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 (fluid pressure)	-	Pressure increases

During pressure front RH brake caliper increases

 Brake fluid is supplied to the front RH brake caliper from the master cylinder through the cut valve 2 and the ABS IN valve. Since the suction valve 2 and the ABS OUT valve is closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to the front RH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

During pressure front LH brake caliper increases

 Brake fluid is supplied to the front LH brake caliper from the master cylinder through the cut valve 1 and the ABS IN valve. Since the suction valve 1 and the ABS OUT valve is closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to the front LH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

During pressure rear RH brake caliper increases

 Brake fluid is supplied to the rear RH brake caliper from the master cylinder through the cut valve 1 and the ABS IN valve. Since the suction valve 1 and the ABS OUT valve is closed, the fluid does not flow into the reservoir. The amount of brake fluid supplied to the rear RH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

During pressure rear LH brake caliper increases

• Brake fluid is supplied to the rear LH brake caliper from the master cylinder through the cut valve 2 and the ABS IN valve. Since the suction valve 2 and the ABS OUT valve is closed, the fluid does not flow into the

< SYSTEM DESCRIPTION >

[WITH ESP]

А

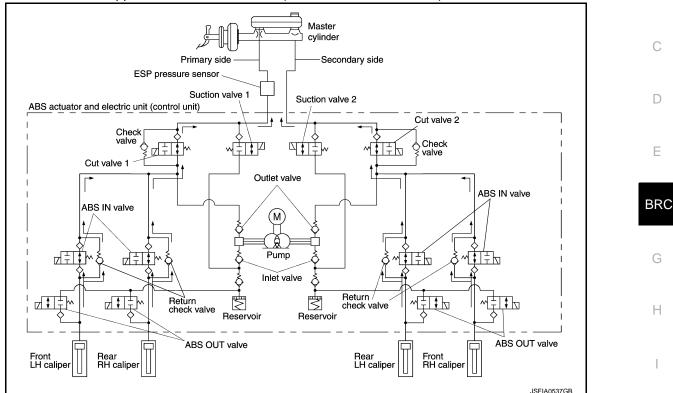
В

reservoir. The amount of brake fluid supplied to the rear LH brake caliper from the master cylinder is controlled according to time that the ABS IN valve is not energized (time that the ABS IN valve is open).

When Brake Release

NOTE:

ESP pressure sensor is applied to models with LHD (MR16DDT and HR16DE).



Name	Not activated	During brake release
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 (fluid pressure)	_	Pressure decreases

During front RH brake caliper release

 Brake fluid is supplied to the front RH brake caliper through the return check valve of the ABS IN valve and the cut valve 2, and returns to the master cylinder.

During front LH brake caliper release

Brake fluid is supplied to the front LH brake caliper through the return check valve of the ABS IN valve and the cut valve 1, and returns to the master cylinder.

During rear RH brake caliper release

 Brake fluid is supplied to the rear RH brake caliper through the return check valve of the ABS IN valve and the cut valve 1, and returns to the master cylinder.

During rear LH brake caliper release

• Brake fluid is supplied to the rear LH brake caliper through the return check valve of the ABS IN valve and the cut valve 2, and returns to the master cylinder.

Component Parts and Function

< SYSTEM DESCRIPTION >

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).
Cut valve 1 Cut valve 2	Shuts off the ordinary brake line from master cylinder.
Suction valve 1 Suction valve 2	Supplies the brake fluid from master cylinder to the pump.
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.
Inlet valve	Brake fluid sucked from the reservoir by the pump does not backflow.
Outlet valve	Brake fluid discharged from the pump does not backflow.
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.
ESP pressure sensor	Detects the brake fluid pressure and transmits signal to ABS actuator and electric unit (control unit).

CONDITION FOR TURN ON THE WARNING LAMP

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

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

CONDITION FOR TURN ON THE INDICATOR LAMP

 Turns ON when ESP function and TCS function are switched to non-operational status (OFF) by ESP OFF switch.

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

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

Fail-safe

[WITH ESP]

INFOID:000000006605597

ESP FUNCTION, TCS FUNCTION AND BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION ESP 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 ESP function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally.

ABS FUNCTION

ABS warning lamp and ESP 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 ESP function, TCS function, ABS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function, ABS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models becomes the same as models.

NOTE:

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

EBD FUNCTION

ABS warning lamp, brake warning lamp and ESP 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 ESP function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function.

BRC

Н

Κ

L

Μ

Ν

Ρ

А

В

С

< SYSTEM DESCRIPTION >

DTC	Malfunction detected condition	Fail-safe condition		
C1101	When an open circuit is detected in rear RH wheel sensor circuit.			
C1102	When an open circuit is detected in rear LH wheel sensor circuit.			
C1103	When an open circuit is detected in front RH wheel sensor circuit.			
C1104	When an open circuit is detected in front LH wheel sensor circuit.			
C1105	 When 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: 7.5 V ≥ Rear RH wheel sensor power supply voltage Rear RH wheel sensor power supply voltage: 16 V ≤ 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: 7.5 V ≥ Rear LH wheel sensor power supply voltage Rear LH wheel sensor power supply voltage: 16 V ≤ 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. 	 The following functions are suspended. ESP function TCS function ABS function EBD function (only when both rear wheels are malfunctioning 		
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: 7.5 V ≥ Front RH wheel sensor power supply voltage Front RH wheel sensor power supply voltage: 16 V ≤ 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. 	Brake limited slip differential (BLSD) function		
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: 7.5 V ≥ Front LH wheel sensor power supply voltage Front LH wheel sensor power supply voltage: 16 V ≤ 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 V ≥ Ignition power supply voltage. Ignition power supply voltage: 16 V ≤ Ignition power supply voltage. 	The following functions are suspended.ESP functionTCS function		
C1110	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	 ABS function EBD function Brake limited slip differential (BLSD) function 		
C1111	When a malfunction is detected in motor or motor relay.	 The following functions are suspended. ESP function TCS function ABS function Brake limited slip differential (BLSD) function 		

< SYSTEM DESCRIPTION >

[WITH ESP]

DTC	Malfunction detected condition	Fail-safe condition	
C1113	When a malfunction is detected in decel G signal, or signal line of yaw rate/side/de- cel G sensor is open or shorted.	 The following functions are suspended. ESP function TCS function ABS function (4WD) Brake limited slip differential (BLSD) function 	В
C1115	When difference in wheel speed between any wheel and others is detected the ve- hicle is driven, because of installation of other tires than specified.	 The following functions are suspended. ESP function TCS function ABS function EBD function Brake limited slip differential (BLSD) function 	C D E
C1116	When stop lamp switch signal is not input when brake pedal operates.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function 	BR
C1120	When a malfunction is detected in front LH ABS IN valve.		G
C1121	When a malfunction is detected in front LH ABS OUT valve.	The following functions are sus-	
C1122	When a malfunction is detected in front RH ABS IN valve.	pended.ESP function	Н
C1123	When a malfunction is detected in front RH ABS OUT valve.	TCS function	
C1124	When a malfunction is detected in rear LH ABS IN valve.	ABS function EBD function	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	 Brake limited slip differential 	
C1126	When a malfunction is detected in rear RH ABS IN valve.	(BLSD) function	
C1127	When a malfunction is detected in rear RH ABS OUT valve.		1
C1130	When a malfunction is detected in ECM system.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function 	K
C1140	When a malfunction is detected in actuator relay.	 The following functions are suspended. ESP function TCS function ABS function EBD function Brake limited slip differential (BLSD) function 	M
C1142	When a malfunction is detected in ESP pressure sensor.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function 	N
C1143	When a malfunction is detected in steering angle sensor.	 The following functions are suspended. ESP function TCS function ABS function (4WD) Brake limited slip differential (BLSD) function 	Ρ

< SYSTEM DESCRIPTION >

[WITH	ESP]
-------	------

DTC	Malfunction detected condition	Fail-safe condition	
C1144	When neutral position adjustment of steering angle sensor is not complete.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function 	
C1145	When a malfunction is detected in yaw rate signal, or signal line of yaw rate/side/ decel G sensor is open or shorted.	The following functions are suspended.	
C1146	When a malfunction is detected in side G signal, or signal line of yaw rate/side/decel G sensor is open or shorted.	 ESP function TCS function ABS function (4WD) Brake limited slip differential (BLSD) function 	
C1155	hen brake fluid level low signal is detected. The following functions a pended. • ESP function • TCS function • Brake limited slip differ (BLSD) function		
C1164	When a malfunction is detected in cut valve 1.	The following functions are sus-	
C1165	When a malfunction is detected in cut valve 2.	pended.ESP function	
C1166	When a malfunction is detected in suction valve 1.	TCS function	
C1167	When a malfunction is detected in suction valve 2.	 ABS function EBD function Brake limited slip differential (BLSD) function 	
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	 The following functions are suspended. ESP function TCS function ABS function Brake limited slip differential (BLSD) function 	
C1176	When brake switch/brake pedal position switch signal is not input when brake pedal operates.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function 	
U1000	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.	The following functions are suspended.	
U1010	When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit).	 ESP function TCS function Brake limited slip differential (BLSD) function 	

ESP FUNCTION

ESP FUNCTION : System Description

INFOID:000000006385712

NOTE:

ESP pressure sensor is applied to models with LHD (MR16DDT and HR16DE).

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

< SYSTEM DESCRIPTION >

[WITH ESP]

А

В

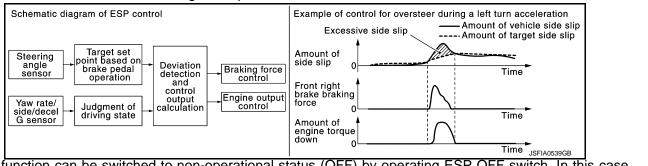
D

Ε

BRC

Н

ing conditions (conditions of understeer or oversteer) are judged and vehicle stability is improved by brake force control on all 4 wheels and engine output control.



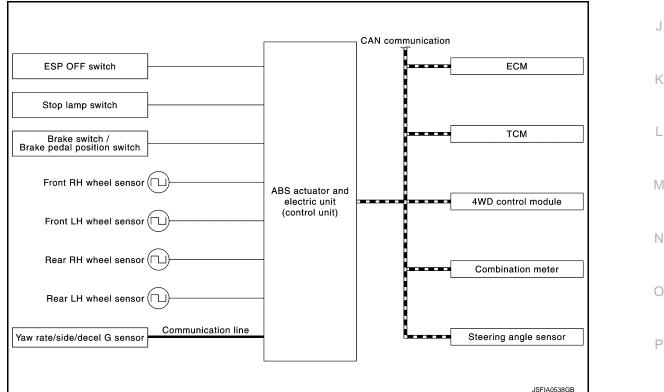
- ESP function can be switched to non-operational status (OFF) by operating ESP OFF switch. In this case, ESP OFF indicator lamp turns ON.
- Control unit portion automatically improves driving stability by performing brake force control as well as engine output control, by transmitting drive signal to actuator portion according to difference between target side slip amount and vehicle side slip amount
- ESP warning lamp blinks while ESP function is in operation and indicates to the driver that the function is in
 operation.
- CONSULT-III can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in ESP function, the control is suspended for ESP function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-117</u>, "Fail-safe".
 NOTE:

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

SYSTEM DIAGRAM

NOTE:

- TCM is CVT models only.
- 4WD control module is 4WD models only.



INPUT SIGNAL AND OUTPUT SIGNAL

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

< SYSTEM DESCRIPTION >

Component	Signal description Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line ^{*1} . Yaw rate signal Side G sensor signal Decel G sensor signal		
Yaw rate/side/decel G sensor			
ECM	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Acceleration pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal 		
TCM ^{*2}	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. N range signal P range signal R range signal Current gear position signal 		
4WD control module ^{*3}	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Current 4WD mode signal 		
Steering angle sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Steering angle sensor signal 		
Mainly receives the following signals from ABS actuator and electric unit (cont communication. Combination meter • Brake fluid level switch signal • ESP warning lamp signal • ESP OFF indicator lamp signal			

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

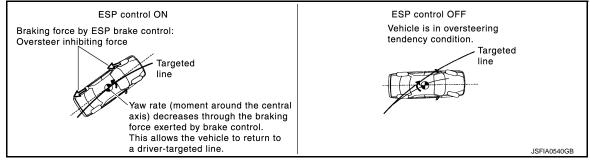
*2: Models with CVT

*3: 4WD models

OPERATION CHARACTERISTICS

ESP Function That Prevents Oversteer Tendency

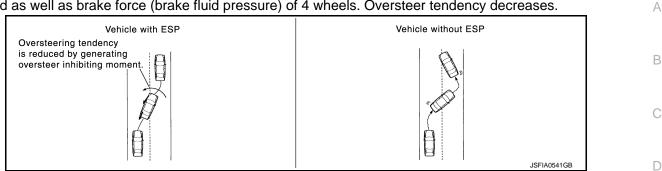
• During a cornering, brake force (brake fluid pressure) is applied on front wheel and rear wheel on the outer side of turn. Moment directing towards the outer side of turn is generated. Oversteer is prevented.



< SYSTEM DESCRIPTION >

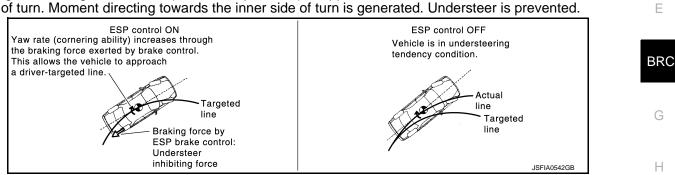
[WITH ESP]

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

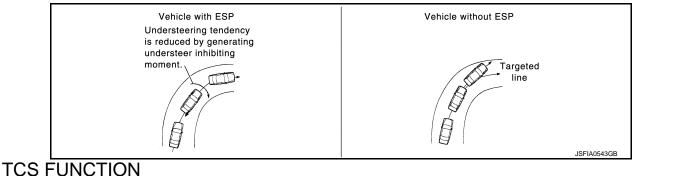


ESP Function That Prevents Understeer Tendency

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



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



M

Κ

L

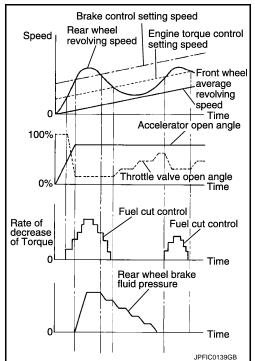
Ν

0

Ρ

TCS FUNCTION : System Description

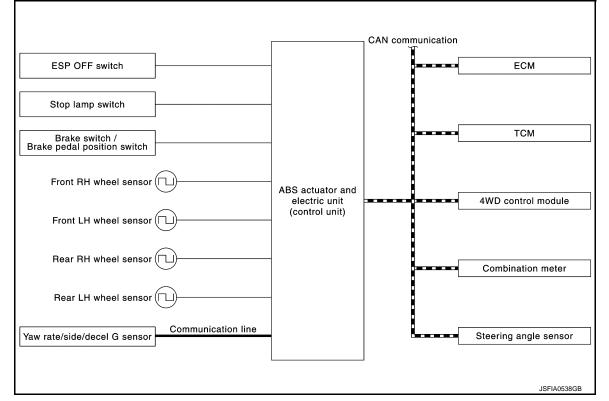
- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Engine output and transmission shift status is controlled so that slip rate of drive wheels is in appropriate level. When wheel spin occurs on drive wheel, ABS actuator and electric unit (control unit) perform brake force control of LH and RH drive wheels (apply brake force by increasing brake fluid pressure of drive wheel) and decrease engine torque by engine torque control. Wheel spin amount decreases. Engine torque is controlled to appropriate level.
- TCS function can be switched to non-operational status (OFF) by operating ESP OFF switch. In this case, ESP OFF indicator lamp turns ON.
- ESP warning lamp blinks while TCS function is in operation and indicates to the driver that the function is in operation.
- CONSULT-III can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for ESP function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-117, "Fail-safe"</u>.



SYSTEM DIAGRAM

NOTE:

- TCM is CVT models only.
- 4WD control module is 4WD models only.



INPUT SIGNAL AND OUTPUT SIGNAL

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

[WITH ESP]

< SYSTEM DESCRIPTION >

Component	Signal description			
Yaw rate/side/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via com- munication line ^{*1} . • Yaw rate signal • Side G sensor signal • Decel G sensor signal			
ECM	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal 			
TCM ^{*2}	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • N range signal • P range signal • R range signal • Current gear position signal			
4WD control module ^{*3}	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Current 4WD mode signal			
Steering angle sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Steering angle sensor signal 			
Mainly receives the following signals from ABS actuator and electric unit (control u communication. Combination meter • Brake fluid level switch signal • ESP warning lamp signal • ESP OFF indicator lamp signal				

*3: 4WD models

ABS FUNCTION

ABS FUNCTION : System Description

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

Μ

Κ

INFOID:000000006601872

0

Ρ

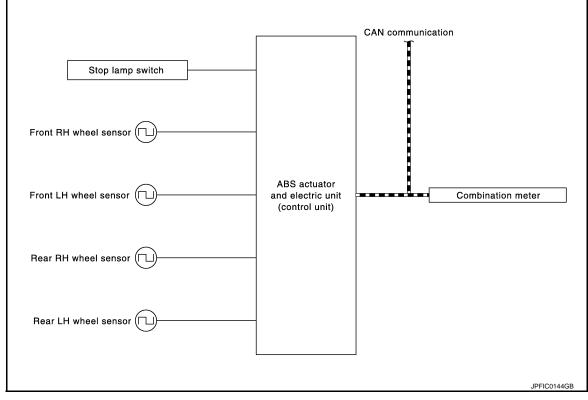
- The following effects are obtained by preventing wheel lock during braking.
- Vehicle tail slip is prevented during braking when driving straight.
- Understeer and oversteer tendencies are moderated during braking driving on a corner.
- Obstacles may be easily bypassed by steering operation during braking.
- CONSULT-III can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for ESP function, TCS function, ABS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function, ABS function and brake limited slip differential (BLSD) function. However, EBD function is operated normally. Refer to <u>BRC-117, "Fail-safe"</u>.

NOTE:

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

sis. In addition, brake pedal may be felt heavy when depressing brake pedal lightly. These symptoms are not malfunctions.

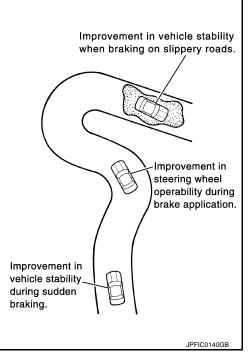
SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

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

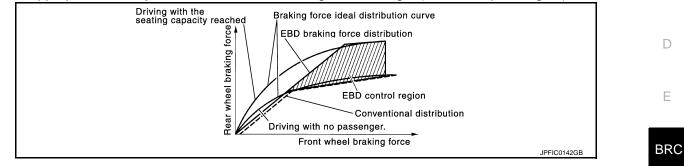


[WITH ESP]

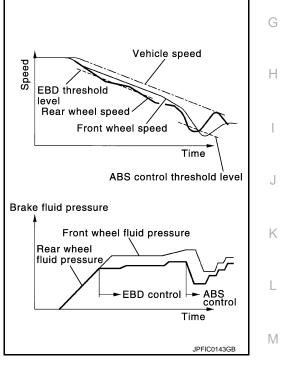
EBD FUNCTION

EBD FUNCTION : System Description

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



- 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-III can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for ESP function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function. Refer to BRC-117, "Fail-safe".



- Ν

Ρ

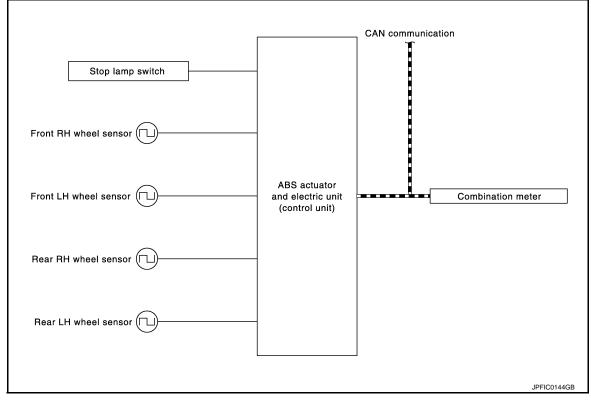
А

В

INEOID:000000006601873

[WITH ESP]

SYSTEM DIAGRAM



INPUT SIGNAL AND OUTPUT SIGNAL

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

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

BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION

BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION : System Description

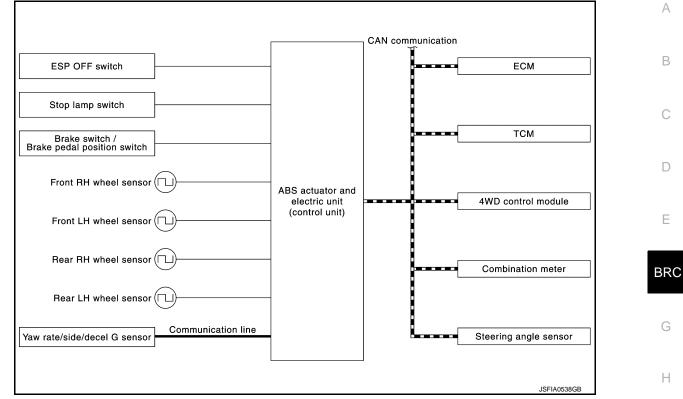
INFOID:000000006605581

- LH and RH driving wheel spin is always monitored. If necessary, appropriate brake force is independently
 applied to LH or RH driving wheel so that one-sided wheel spin is avoided and traction is maintained. Mainly
 starting ability is improved.
- Brake limited slip differential (BLSD) function operates while ESP function is in non-operational status (OFF) by ESP OFF switch.
- ESP warning lamp blinking while brake limited slip differential (BLSD) function is in operation and indicates to the driver that the function is in operation.
- Slight vibrations are felt on the brake pedal and the operation noises occur, when brake limited slip differential (BLSD) function operates. This is not a malfunction because it is caused by brake limited slip differential (BLSD) function that is normally operated.
- Fail-safe function is adopted. When a malfunction occurs in brake limited slip differential (BLSD) function, the control is suspended for ESP function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally. Refer to <u>BRC-117, "Fail-safe"</u>.

SYSTEM DIAGRAM **NOTE:**

• TCM is CVT models only.

• 4WD control module is 4WD models only.



INPUT SIGNAL AND OUTPUT SIGNAL

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

Component	Signal description		
Yaw rate/side/decel G sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line^{*1}. Yaw rate signal Side G sensor signal Decel G sensor signal 		
ECM	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Accelerator pedal position signal Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. Target throttle position signal 		
TCM ^{*2}	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication. N range signal P range signal R range signal Current gear position signal 		
4WD control module ^{*3}	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. • Current 4WD mode signal		
Steering angle sensor	 Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. Steering angle sensor signal 		
Combination meter Mainly receives the following signals from ABS actuator and electric unit (control unit) communication. • ESP warning lamp signal • ESP OFF indicator lamp			

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

*2: Models with CVT *3: 4WD models

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

< SYSTEM DESCRIPTION >

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

CONSULT-III Function

INFOID:000000006601874 В

А

Н

Κ

Ρ

[WITH ESP]

APPLICATION ITEMS

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

Mode	Function description		
ECU identification	Parts number of ABS actuator and electric unit (control unit) can be read.		
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*1		
DATA MONITOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.		
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.		
Function Test ^{*2}	unction Test ^{*2} This mode can show results of self-diagnosis of ECU with either "OK" or "NG". For engine, more pr tical tests regarding sensors/switches and/or actuators are available.		
Work support	Components can be quickly and accurately adjusted.		

T. The following diagnosis information is erased by erasing

DTC

• Freeze frame data (FFD)

*2: Although "Function Test" is selectable, do not use its.

ECU IDENTIFICATION

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

SELF DIAGNOSTIC RESULT Refer to BRC-142, "DTC Index".

When "CRNT" is displayed on self-diagnosis result

The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result

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

Freeze frame data (FFD)

When DTC is detected, a vehicle state shown below is recorded and displayed on CONSULT-III.

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

DATA MONITOR

×: Applicable

Item (Unit)	Monitor item selection		Note
	ECU INPUT SIGNALS	MAIN SIGNALS	- Note
FR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front LH wheel sensor is displayed.
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by front RH wheel sensor is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear LH wheel sensor is displayed.

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

< SYSTEM DESCRIPTION >

[WITH ESP]

Item (Unit)	Monitor item selection		Note	
item (Onit)	ECU INPUT SIGNALS	MAIN SIGNALS	Note	
RR RH SENSOR [km/h (MPH)]	×	×	Wheel speed calculated by rear RH wheel sensor is displayed.	
DECEL G-SEN (G)	×	×	Decel G detected by decel G sensor is displayed.	
FR RH IN SOL (On/Off)		×	Operation status of front RH wheel ABS IN valve is displayed.	
FR RH OUT SOL (On/Off)		×	Operation status of front RH wheel ABS OUT valve is displayed.	
FR LH IN SOL (On/Off)		×	Operation status of front LH wheel ABS IN valve is displayed.	
FR LH OUT SOL (On/Off)		×	Operation status of front LH wheel ABS OUT valve is displayed.	
RR RH IN SOL (On/Off)		×	Operation status of rear RH wheel ABS IN valve is displayed	
RR RH OUT SOL (On/Off)		×	Operation status of rear RH wheel ABS OUT valve is displayed.	
RR LH IN SOL (On/Off)		×	Operation status of rear LH wheel ABS IN valve is displayed.	
RR LH OUT SOL (On/Off)		×	Operation status of rear LH wheel ABS OUT valve is displayed.	
EBD WARN LAMP (On/Off)			Brake warning lamp ON/OFF status is displayed. *1	
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal input status is displayed.	
MOTOR RELAY (On/Off)		×	ABS motor and motor relay status is displayed.	
ACTUATOR RLY (On/Off)		×	ABS actuator relay status is displayed.	
ABS WARN LAMP (On/Off)		×	ABS warning lamp ON/OFF status is displayed. *1	
OFF LAMP (On/Off)		×	ESP OFF indicator lamp ON/OFF status is displayed. *1	
OFF SW (On/Off)	×	×	ESP OFF switch signal input status is displayed.	
SLIP/VDC LAMP (On/Off)		×	warning lamp ON/OFF status is displayed. *1	
BATTERY VOLT (V)	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.	
GEAR ^{*2}	×	×	Current gear position judged from current gear position signal is displayed.	
ENGINE SPEED [tr/min (rpm)]	×	×	Engine speed status is displayed.	
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate sensor is displayed.	
R POSI SIG (On/Off)			R range signal input status judged from R range signal is displayed.	
4WD MODE MON (2WD/AUTO)	×	×	4WD control status is displayed.	
N POSI SIG (On/Off)			N range signal input status judged from N range signal is displayed.	
P POSI SIG (On/Off)			P range signal input status judged from P range signal is displayed.	

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

< SYSTEM DESCRIPTION >

[WITH ESP]

lterre (I Init)	Monitor ite	m selection	Note	
Item (Unit)	ECU INPUT SIGNALS MAIN SIGNALS		- Note	A
CV1 (On/Off)			Cut valve 1 operation status is displayed.	В
CV2 (On/Off)			Cut valve 2 operation status is displayed.	D
SV1 (On/Off)			Suction valve 1 operation status is displayed.	С
SV2 (On/Off)			Suction valve 1 operation status is displayed.	D
STOP LAMP SW2 (On/Off)			Brake switch/brake pedal position switch signal input sta- tus is displayed.	D
ACCEL POS SIG (%)	×		Displays the Accelerator pedal position	Е
SIDE G-SENSOR (m/s2)	×		Side G detected by side G sensor is displayed.	
STR ANGLE SIG (deg)	×		Steering angle detected by steering angle sensor is displayed.	BRO
EBD SIGNAL (On/Off)			EBD operation status is displayed.	G
ABS SIGNAL (On/Off)			ABS operation status is displayed.	
TCS SIGNAL (On/Off)			TCS operation status is displayed.	Н
VDC SIGNAL (On/Off)			ESP operation status is displayed.	Ι
EBD FAIL SIG (On/Off)			EBD fail-safe signal status is displayed.	
ABS FAIL SIG (On/Off)			ABS fail-safe signal status is displayed.	J
TCS FAIL SIG (On/Off)			TCS fail-safe signal status is displayed.	K
VDC FAIL SIG (On/Off)			ESP fail-safe signal status is displayed.	
CRANKING SIG (On/Off)			Cranking status is displayed.	L
FLUID LEV SW (On/Off)	×		Brake fluid level signal input status via CAN communica- tion is displayed.	M

*1: Refer to <u>BRC-105</u>, "System Description" for ON/OFF conditions of each warning lamp.

*2: Models with CVT

ACTIVE TEST

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

CAUTION:

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

NOTE:

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

BRC-133

- Ν
- 0

Ρ

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

< SYSTEM DESCRIPTION >

[WITH ESP]

ABS IN Valve and ABS OUT Valve

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

Test item	Dianlay item		Display	
Test tieffi	Display item	Up	Кеер	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR RH SOL	FR RH OUT SOL	Off	Off	On*
FR LH SOL	FRLH 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 IN SOL	Off	On	On
RR LH SOL	RR LH OUT SOL	Off	Off	On*

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

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

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

Test item	Diaplay itam		Display	
iest item	Display item	Up	ACT KEEP	ACT UP
	FR RH IN SOL	Off	Off	Off
	FR RH OUT SOL	Off	Off	Off
FR RH ABS SOLE-	CV1	Off	Off	Off
NOID (ACT)	CV2	Off	On	On
	SV1	Off	Off	Off
	SV2	Off	Off	On*
	FRLH IN SOL	Off	Off	Off
	FR LH OUT SOL	Off	Off	Off
FR LH ABS SOLE-	CV1	Off	On	On
NOID (ACT)	CV2	Off	Off	Off
	SV1	Off	Off	On*
	SV2	Off	Off	Off
	RR RH IN SOL	Off	Off	Off
	RR RH OUT SOL	Off	Off	Off
RR RH ABS SOLE-	CV1	Off	On	On
NOID (ACT)	CV2	Off	Off	Off
	SV1	Off	Off	On*
	SV2	Off	Off	Off
	RR LH IN SOL	Off	Off	Off
	RR LH OUT SOL	Off	Off	Off
RR LH ABS SOLE-	CV1	Off	Off	Off
NOID (ACT)	CV2	Off	On	On
	SV1	Off	Off	Off
	SV2	Off	Off	On*

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

ABS Motor

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

< SYSTEM DESCRIPTION >

[WITH ESP]

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

Test item	Display item	Display		
restitem	Display item	On	Off	
ABS MOTOR	MOTOR RELAY	On	Off	
ADS WOTOR	ACTUATOR RLY	On	On	

Е

А

В

С

D

BRC

G

Н

J

Κ

L

Μ

Ν

Ο

Ρ

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000006548672

[WITH ESP]

CONSULT-III DATA MONITOR STANDARD VALUE

Monitor item	Condition	Reference values in normal operation
	Vehicle stopped	0.00 km/h (MPH)
FR LH SENSOR	When driving straight ahead ^{*1}	Nearly matches the speedometer display (within $\pm 10\%$)
	Vehicle stopped	0.00 km/h (MPH)
FR RH SENSOR	When driving straight ahead ^{*1}	Nearly matches the speedometer display (within ±10%)
	Vehicle stopped	0.00 km/h (MPH)
RR LH SENSOR	When driving straight ahead ^{*1}	Nearly matches the speedometer display (within ±10%)
	Vehicle stopped	0.00 km/h (MPH)
RR RH SENSOR	When driving straight ahead ^{*1}	Nearly matches the speedometer display (within $\pm 10\%$)
	When stopped	-0.11 - 0.11 G
DECEL G-SEN	During acceleration	Negative value
	During deceleration	Positive value
FR RH IN SOL*2	Active	On
FR RH IN SOL -	Not activated	Off
FR RH OUT SOL ^{*2}	Active	On
FR RH OUT SOL 2	Not activated	Off
55 / / / // 0.0/ *2	Active	On
FR LH IN SOL ^{*2}	Not activated	Off
FR LH OUT SOL*2	Active	On
FR LH OUT SOL -	Not activated	Off
RR RH IN SOL ^{*2}	Active	On
RR RH IN SOL -	Not activated	Off
RR RH OUT SOL ^{*2}	Active	On
RR RH OUT SOL -	Not activated	Off
RR LH IN SOL*2	Active	On
RR LH IN SOL -	Not activated	Off
RR LH OUT SOL ^{*2}	Active	On
RR LH OUT SOL -	Not activated	Off
EBD WARN LAMP	When brake warning lamp is ON ^{*3}	On
	When brake warning lamp is OFF ^{*3}	Off
	Brake pedal depressed	On
STOP LAMP SW	Brake pedal not depressed	Off
	Active	On
MOTOR RELAY	Not activated	Off
	Active	On
ACTUATOR RLY	Not activated (in fail-safe mode)	Off

< ECU DIAGNOSIS INFORMATION >

[WITH ESP]

Monitor item	Condition	Reference values in normal operation	٨
	When ABS warning lamp is ON ^{*3}	On	A
ABS WARN LAMP	When brake warning lamp is OFF ^{*3}	Off	
	When ESP OFF indicator lamp is ON ^{*3}	On	В
OFF LAMP	When ESP OFF indicator lamp is OFF ^{*3}	Off	
	ESP OFF switch ON	On	0
OFF SW	ESP OFF switch OFF	Off	С
	When ESP warning lamp is ON ^{*3}	On	
SLIP/VDC LAMP	When ESP warning lamp is OFF*3	Off	D
BATTERY VOLT	Ignition switch ON	10 – 16 V	
		1-8	Е
GEAR ^{*4}	Driving	Depending on shift status	
	Engine stopped	0 rpm	
ENGINE SPEED	Engine running	Almost same reading as tachometer	BRC
	Vehicle stopped	Approx. 0 d/s	
YAW RATE SEN	Turning right	Negative value	G
	Turning left	Positive value	G
R POSI SIG	When selector lever is in the R position	On	
R PU3I 3IG	When selector lever is in the other position than R	Off	Н
4WD MODE MON	Always	Depending on 4WD control status	
N POSI SIG	When selector lever is in the N position	On	
N F031 313	When selector lever is in the other position than N	Off	I
P POSI SIG	When selector lever is in the P position	On	
F F031313	When selector lever is in the other position than P	Off	J
CV1*2	Active	On	
CV1 2 Not activated		Off	
CV2*2	Active	On	K
672	Not activated	Off	
SV1 ^{*2}	Active	On	L
311	Not activated	Off	
SV2 ^{*2}	Active	On	
572	Not activated	Off	M
STOP LAMP SW2	Brake pedal depressed	On	
	Brake pedal not depressed	Off	Ν
ACCEL POS SIG	Never depress accelerator pedal (with ignition switch ON)	0%	
	Depress accelerator pedal (with ignition switch ON)	0 – 100%	0
	Vehicle stopped	Approx. 0 m/s ²	
SIDE G-SENSOR	Turning right	Negative value	
	Turning left	Positive value	Ρ
	When driving straight	0±2.5°	
STR ANGLE SIG	When steering wheel is steered to LH by 90°	Approx. +90°	
	When steering wheel is steered to RH by 90°	Approx. –90°	
EBD SIGNAL	EBD is activated	On	
	EBD is not activated	Off	

< ECU DIAGNOSIS INFORMATION >

Monitor item	Condition	Reference values in normal operation
ABS SIGNAL	ABS is activated	On
ADS SIGNAL	ABS is not activated	Off
TCS SIGNAL	TCS is activated	On
ICS SIGNAL	TCS is not activated	Off
VDC SIGNAL	ESP is activated	On
VDC SIGNAL	ESP is not activated	Off
EBD FAIL SIG	In EBD fail-safe	On
EDD FAIL SIG	EBD is normal	Off
ABS FAIL SIG	In ABS fail-safe	On
ADS FAIL SIG	ABS is normal	Off
TCS FAIL SIG	In TCS fail-safe	On
TGS FAIL SIG	TCS is normal	Off
VDC FAIL SIG	In ESP fail-safe	On
VDC FAIL SIG	ESP is normal	Off
CRANKING SIG	At cranking	On
CRAINNING SIG	Other than at cranking	Off
FLUID LEV SW	When brake fluid level switch is ON (brake fluid level is less than the specified level)	On
	When brake fluid level switch is OFF	Off

*1: Confirm tire pressure is standard value.

*2: Refer to "valve operation" in <u>BRC-105, "System Description"</u> for valve operation of each valve.

*3: Refer to <u>BRC-105, "System Description"</u> for ON/OFF conditions of each warning lamp and indicator lamp.

*4: Models with CVT.

Fail-safe

INFOID:000000006548673

ESP FUNCTION, TCS FUNCTION AND BRAKE LIMITED SLIP DIFFERENTIAL (BLSD) FUNCTION ESP 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 ESP function, TCS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function and brake limited slip differential (BLSD) function. However, ABS function and EBD function are operated normally.

ABS FUNCTION

ABS warning lamp and ESP 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 ESP function, TCS function, ABS function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function, ABS function and brake limited slip differential (BLSD) function and brake limited slip differential (BLSD) function and brake limited slip differential (BLSD) function. However, EBD function is operated normally.

NOTE:

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

EBD FUNCTION

ABS warning lamp, brake warning lamp and ESP 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 ESP function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function. The vehicle status becomes the same as models without ESP function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function.

< ECU DIAGNOSIS INFORMATION >

[WITH ESP]

DTC	Malfunction detected condition	Fail-safe condition	_
C1101	When an open circuit is detected in rear RH wheel sensor circuit.		-
C1102	When an open circuit is detected in rear LH wheel sensor circuit.		
C1103	When an open circuit is detected in front RH wheel sensor circuit.		
C1104	When an open circuit is detected in front LH wheel sensor circuit.		
	 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: 7.5 V ≥ Rear RH wheel sensor power supply voltage 		
C1105	 Rear RH wheel sensor power supply voltage: 16 V ≤ 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: 7.5 V ≥ Rear LH wheel sensor power supply voltage Rear LH wheel sensor power supply voltage: 16 V ≤ Rear LH wheel sensor power supply voltage 	The following functions are sus- pended. • ESP function	
	 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. 	 TCS function ABS function EBD function (only when both 2 rear wheels are malfunctioning) 	
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: 7.5 V ≥ Front RH wheel sensor power supply voltage Front RH wheel sensor power supply voltage: 16 V ≤ Front RH wheel sensor power 	Brake limited slip differential (BLSD) function	
01107	 er 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: 7.5 V ≥ Front LH wheel sensor power supply voltage Front LH wheel sensor power supply voltage: 16 V ≤ 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 V ≥ Ignition power supply voltage. Ignition power supply voltage: 16 V ≤ Ignition power supply voltage. 	The following functions are sus- pended. • ESP function • TCS function	
C1110	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	 ABS function EBD function Brake limited slip differential (BLSD) function 	
C1111	When a malfunction is detected in motor or motor relay.	 The following functions are suspended. ESP function TCS function ABS function Brake limited slip differential (BLSD) function 	-

< ECU DIAGNOSIS INFORMATION >

[WITH ESP]

DTC	Malfunction detected condition	Fail-safe condition
C1113	When a malfunction is detected in decel G signal, or signal line of yaw rate/side/de- cel G sensor is open or shorted.	 The following functions are suspended. ESP function TCS function ABS function (4WD) Brake limited slip differential (BLSD) function
C1115	When difference in wheel speed between any wheel and others is detected the ve- hicle is driven, because of installation of other tires than specified.	 The following functions are suspended. ESP function TCS function ABS function EBD function Brake limited slip differential (BLSD) function
C1116	When stop lamp switch signal is not input when brake pedal operates.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function
C1120	When a malfunction is detected in front LH ABS IN valve.	
C1121	When a malfunction is detected in front LH ABS OUT valve.	The following functions are sus-
C1122	When a malfunction is detected in front RH ABS IN valve.	pended.ESP function
C1123	When a malfunction is detected in front RH ABS OUT valve.	TCS function
C1124	When a malfunction is detected in rear LH ABS IN valve.	ABS function EBD function
C1125	When a malfunction is detected in rear LH ABS OUT valve.	Brake limited slip differential
C1126	When a malfunction is detected in rear RH ABS IN valve.	(BLSD) function
C1127	When a malfunction is detected in rear RH ABS OUT valve.	
C1130	When a malfunction is detected in ECM system.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function
C1140	When a malfunction is detected in actuator relay.	 The following functions are suspended. ESP function TCS function ABS function EBD function Brake limited slip differential (BLSD) function
C1142	When a malfunction is detected in ESP pressure sensor.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function
C1143	When a malfunction is detected in steering angle sensor.	 The following functions are suspended. ESP function TCS function ABS function (4WD) Brake limited slip differential (BLSD) function

< ECU DIAGNOSIS INFORMATION >

INFOID:000000006548674

Ο

DTC	Malfunction detected condition	Fail-safe condition	
C1144	When neutral position adjustment of steering angle sensor is not complete.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function 	- ,4 E
C1145	When a malfunction is detected in yaw rate signal, or signal line of yaw rate/side/ decel G sensor is open or shorted.	The following functions are suspended.	(
C1146	When a malfunction is detected in side G signal, or signal line of yaw rate/side/decel G sensor is open or shorted.	 ESP function TCS function ABS function (4WD) Brake limited slip differential (BLSD) function 	Γ
C1155	When brake fluid level low signal is detected.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function 	B
C1164	When a malfunction is detected in cut valve 1.	The following functions are sus-	
C1165	When a malfunction is detected in cut valve 2.	pended.ESP function	(
C1166	When a malfunction is detected in suction valve 1.	TCS function	
C1167	When a malfunction is detected in suction valve 2.	 ABS function EBD function Brake limited slip differential (BLSD) function 	ŀ
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	 The following functions are suspended. ESP function TCS function ABS function Brake limited slip differential (BLSD) function 	_
C1176	When brake switch/brake pedal position switch signal is not input when brake pedal operates.	 The following functions are suspended. ESP function TCS function Brake limited slip differential (BLSD) function 	
U1000	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.	The following functions are suspended.	P
U1010	When detecting error during the initial diagnosis of CAN controller of ABS actuator and electric unit (control unit).	 ESP function TCS function Brake limited slip differential (BLSD) function 	-

DTC Inspection Priority Chart

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

Priority	Detected item (DTC)	
1	U1000 CAN COMM CIRCUIT U1010 CONTROL UNIT (CAN)	Ρ
2	C1110 CONTROLLER FAILURE C1170 VARIANT CODING	
3	C1130 ENGINE SIGNAL 1 C1144 ST ANG SEN SIGNAL	

< ECU DIAGNOSIS INFORMATION >

[WITH E	SP]
---------	-----

Priority		Detected item (DT	C)
4	C1109 BATTER C1111 PUMP M C1140 ACTUAT		
5	 C1116 STOP L/ C1120 FR LH II C1121 FR LH C C1122 FR RH I C1123 FR RH C C1125 RR LH II C1125 RR LH C C1126 RR RH I C1127 RR RH C C1127 RR RH C C1142 PRESS C1143 ST ANG C1145 YAW RA C1146 SIDE G C1164 CV 1 C1165 CV 2 C1166 SV 1 C1167 SV 2 C1176 STOP L 	SENSOR-1 SENSOR-1 SENSOR-2 SENSOR-2 SENSOR-2 SENSOR-2 SENSOR-2 ENSOR-2 SENSOR-2 OR NSOR [ABNORMAL SIGNAL] AMP SW N ABS SOL OUT ABS SOL SEN CIRCUIT SEN CIRCUIT TE SENSOR SEN CIRCUIT	
6	• C1155 BR FLU	D LEVEL LOW	
DTC Index			INFOID:00000006548675
	DTC	Display Item	Refer to
	C1101	RR RH SENSOR-1	
	C1102	RR LH SENSOR-1	

DTC	Display Item	Refer to
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	BRC-151, "DTC Logic"
C1103	FR RH SENSOR-1	BRC-131, DTC Logic
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	BRC-154. "DTC Logic"
C1107	FR RH SENSOR-2	BRO-134, DTO LOGIC
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-160, "DTC Logic"
C1110	CONTROLLER FAILURE	BRC-162, "DTC Logic"
C1111	PUMP MOTOR	BRC-163, "DTC Logic"
C1113	G-SENSOR	BRC-165, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-168, "DTC Logic"
C1116	STOP LAMP SW	BRC-174, "DTC Logic"
C1120	FR LH IN ABS SOL	BRC-179, "DTC Logic"
C1121	FR LH OUT ABS SOL	BRC-181, "DTC Logic"
C1122	FR RH IN ABS SOL	BRC-179, "DTC Logic"
C1123	FR RH OUT ABS SOL	BRC-181, "DTC Logic"

< ECU DIAGNOSIS INFORMATIO	N >

—	Refer to	Display Item	DTC
— A	BRC-179, "DTC Logic"	RR LH IN ABS SOL	C1124
	BRC-181, "DTC Logic"	RR LH OUT ABS SOL	C1125
В	BRC-179, "DTC Logic"	RR RH IN ABS SOL	C1126
	BRC-181, "DTC Logic"	RR RH OUT ABS SOL	C1127
	BRC-183, "DTC Logic"	ENGINE SIGNAL 1	C1130
С	BRC-184, "DTC Logic"	ACTUATOR RLY	C1140
	BRC-186, "DTC Logic"	PRESS SEN CIRCUIT	C1142
D	BRC-189, "DTC Logic"	ST ANG SEN CIRCUIT	C1143
	BRC-191, "DTC Logic"	ST ANG SEN SIGNAL	C1144
	BRC-165, "DTC Logic"	YAW RATE SENSOR	C1145
E	BRC-105, DTC LOgic	SIDE G SEN CIRCUIT	C1146
	BRC-192, "DTC Logic"	BR FLUID LEVEL LOW	C1155
BRO	BRC-195, "DTC Logic"	CV 1	C1164
	BRC-195, DTC LOgic	CV 2	C1165
	BRC-197, "DTC Logic"	SV 1	C1166
G	BRC-197, DTC Logic	SV 2	C1167
	BRC-162, "DTC Logic"	VARIANT CODING	C1170
— Н	BRC-199, "DTC Logic"	STOP LAMP SW2	C1176
	BRC-203, "DTC Logic"	CAN COMM CIRCUIT	U1000
	BRC-204, "DTC Logic"	CONTROL UNIT (CAN)	U1010

J

Κ

L

Μ

Ν

0

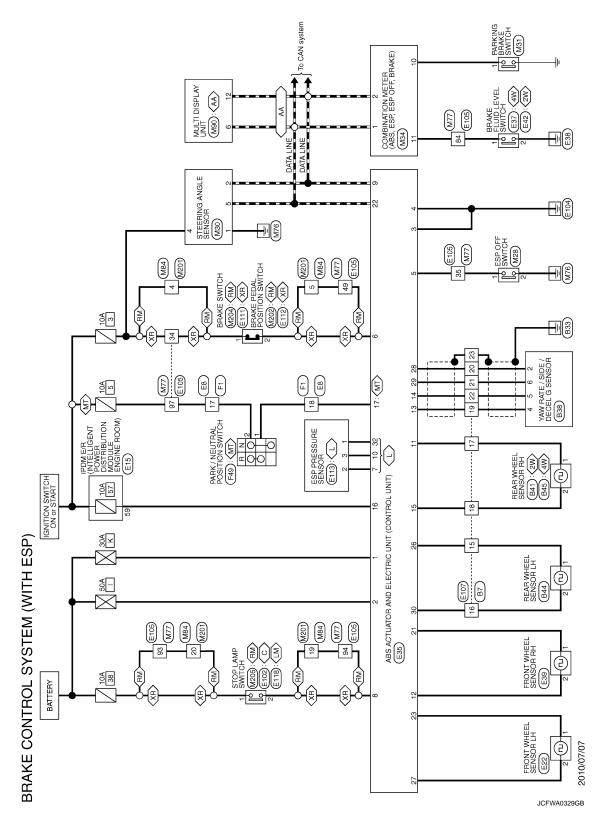
Ρ

WIRING DIAGRAM BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:000000006601879

For connector terminal arrangements, harness layout, and alphabets in a \bigcirc (option abbreviation; if not described in wiring diagram), refer to <u>GI-12, "Connector Information/Explanation of Option Abbreviation"</u>.



DIAGNOSIS AND REPAIR WORK FLOW	
< BASIC INSPECTION >	[WITH ESP]
BASIC INSPECTION	
DIAGNOSIS AND REPAIR WORK FLOW	
Work Flow	INFOID:00000006601880
DETAILED FLOW	
1.INTERVIEW FROM THE CUSTOMER	
Clarify customer complaints before inspection. First of all, perform an interview utilizir <u>Work Sheet</u> " and reproduce the symptom as well as fully understand it. Ask customer carefully.Check symptoms by driving vehicle with customer, if necessary. <u>CAUTION</u> : Customers are not professional. Never guess easily like "maybe the custom	about his/her complaints
maybe the customer mentions this symptom".	
>> GO TO 2.	
2. СНЕСК ЅҮМРТОМ	
Reproduce the symptom that is indicated by the customer, based on the informator obtained by interview. Also check that the symptom is not caused by fail-safe mode. safe".	
When the symptom is caused by normal operation, fully inspect each portion standing of customer that the symptom is not caused by a malfunction.	and obtain the under-
standing of customer that the symptom is not caused by a manufaction.	
>> GO TO 3.	
>> GO TO 3.	
>> GO TO 3. 3.PERFORM THE SELF-DIAGNOSIS	
>> GO TO 3. 3.PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS".	
>> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". <u>Is DTC detected?</u>	
>> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6.	
>> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". <u>Is DTC detected?</u> YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6.	
>> GO TO 3. 3.PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6. 4.RECHECK THE SYMPTOM With CONSULT-III.	
>> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS".	
 >> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS". 2. Perform DTC confirmation procedures for the error-detected system. NOTE: 	
 >> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS". 2. Perform DTC confirmation procedures for the error-detected system. 	
 >> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS". 2. Perform DTC confirmation procedures for the error-detected system. NOTE: If some DTCs are detected at the some time, determine the order for performing BRC-141, "DTC Inspection Priority Chart" [ABS actuator and electric unit (control 	
 >> GO TO 3. 3.PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". <u>Is DTC detected?</u> YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6. 4.RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS". 2. Perform DTC confirmation procedures for the error-detected system. NOTE: If some DTCs are detected at the some time, determine the order for performing <u>BRC-141, "DTC Inspection Priority Chart"</u> [ABS actuator and electric unit (control Is any DTC detected? YES >> GO TO 5. NO >> Check harness and connectors based on the information obtained by ir 	unit)].
>> GO TO 3. 3.PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6. 4.RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS". 2. Perform DTC confirmation procedures for the error-detected system. NOTE: If some DTCs are detected at the some time, determine the order for performing <u>BRC-141, "DTC Inspection Priority Chart"</u> [ABS actuator and electric unit (control Is any DTC detected? YES >> GO TO 5. NO >> Check harness and connectors based on the information obtained by in <u>"Intermittent Incident"</u> .	unit)].
 >> GO TO 3. 3.PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". <u>Is DTC detected?</u> YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6. 4.RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS". 2. Perform DTC confirmation procedures for the error-detected system. NOTE: If some DTCs are detected at the some time, determine the order for performing <u>BRC-141, "DTC Inspection Priority Chart"</u> [ABS actuator and electric unit (control Is any DTC detected? YES >> GO TO 5. NO >> Check harness and connectors based on the information obtained by ir 	unit)].
 >> GO TO 3. 3. PERFORM THE SELF-DIAGNOSIS With CONSULT-III. Perform self-diagnosis for "ABS". <u>Is DTC detected?</u> YES >> Record or print self-diagnosis results and GO TO 4. NO >> GO TO 6. 4. RECHECK THE SYMPTOM With CONSULT-III. 1. Erase self-diagnostic results for "ABS". 2. Perform DTC confirmation procedures for the error-detected system. NOTE: If some DTCs are detected at the some time, determine the order for performing <u>BRC-141, "DTC Inspection Priority Chart"</u> [ABS actuator and electric unit (control Is any DTC detected? YES >> GO TO 5. NO >> Check harness and connectors based on the information obtained by in <u>"Intermittent Incident".</u> 5. REPAIR OR REPLACE ERROR-DETECTED PART Repair or replace error-detected parts. Reconnect part or connector after repairing or replacing. 	unit)].

Estimate error-detected system based on symptom diagnosis and perform inspection. Can the error-detected system be identified?

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITH ESP]

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to <u>GI-42</u>, <u>"Intermittent Incident"</u>.

7.FINAL CHECK

With CONSULT-III.

- 1. Check the reference value for "ABS".
- 2. Recheck the symptom and check that the symptom is not reproduced on the same conditions.

Is the symptom reproduced?

YES >> GO TO 3.

NO >> INSPECTION END

Diagnostic Work Sheet

INFOID:000000006601881

Description

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

INTERVIEW SHEET SAMPLE

			Interviev	w sheet						
Customer name	MR/MS	Registration number			Initial year registration					
name		Vehicle type				VIN				
Storage date		Engine				Mile	age	km	I (Mile)
		Does not operate () fu	Inction			
		Warning lar	np for () turr	ns ON.
Symptom		□ Noise					Vibration			
		□ Other ()
First occurren	се	□ Recently	□ Oth	ner ()
Frequency of	occurrence	□ Always	🗆 Uno	der a certai	n condi	tions of	□ Sor	netimes (time(s	s)/day)
		□ Irrelevant								
Climate con-	Weather	□ Fine □	I Cloud	🗆 Ra	in	□Snow	□ Otł	ners ()
ditions	Temperature	□ Hot □W	/arm	Cool	ΠC	old l	Tempera	ature [Approx.	°C (°F)]
	Relative humidity	🗆 High		Moderate		Lo'	w			
Road conditions		□ Urban area □ Mountainou		Suburb (uphill or do			□ Highwa □ Rough	•		
Operating condition, etc.		□Irrelevant □When engin □During drivi □During decord □During corr □When steer	ng eleratior nering (ri	During n ight curve d	or left cu	ration urve)		onstant speed	driving	

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[WITH ESP]

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

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

< BASIC INSPECTION >

[WITH ESP]

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

Description

INFOID:000000006385774

When replaced the ABS actuator and electric unit (control unit), Perform decel G sensor calibration. Refer to <u>BRC-149, "Work Procedure"</u>.

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION < BASIC INSPECTION > [WITH ESP]

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:000000006385775

А

Always adjust the neutral position of steering angle sensor before driving when the following operation is performed. ${}^{\sf B}$

Procedure	Adjust the neutral position of steering angle sensor
Removing/ installing ABS actuator and electric unit (control unit)	_
Replacing ABS actuator and electric unit (control unit)	×
Removing/installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/installing steering components	×
eplacing steering components	X
emoving/installing suspension components	×
eplacing suspension components	X
emoving/installing tire	_
eplacing tire	_
ire rotation	_
djusting wheel alignment.	×
ork Procedure	INFOID:00000006385776
Ijusted other than with CONSULT-III.)	al position of steering angle sensor. (It cannot be
Jjusted other than with CONSULT-III.) .CHECK THE VEHICLE STATUS	
djusted other than with CONSULT-III.) .CHECK THE VEHICLE STATUS top vehicle with front wheels in the straight-ahead position?	
djusted other than with CONSULT-III.) .CHECK THE VEHICLE STATUS top vehicle with front wheels in the straight-ahead posi- tops the vehicle stay in the straight-ahead position? YES >> GO TO 2.	ition.
Ijusted other than with CONSULT-III.) CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead positions oes the vehicle stay in the straight-ahead position? YES >> GO TO 2. NO >> Steer the steering wheel to the straight-ahead	ition. ad position. Stop the vehicle.
djusted other than with CONSULT-III.) .CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead positions oes the vehicle stay in the straight-ahead position? (ES >> GO TO 2. NO >> Steer the steering wheel to the straight-ahead	ition. ad position. Stop the vehicle.
djusted other than with CONSULT-III.) .CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead position? ces the vehicle stay in the straight-ahead position? (ES >> GO TO 2. NO >> Steer the steering wheel to the straight-ahead .ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III.	ition. ad position. Stop the vehicle.
Ajusted other than with CONSULT-III.) CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead posi- oes the vehicle stay in the straight-ahead position? (ES >> GO TO 2. NO >> Steer the steering wheel to the straight-ahe ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III. Turn the ignition switch ON.	ition. ad position. Stop the vehicle.
Ijusted other than with CONSULT-III.) CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead posi- bes the vehicle stay in the straight-ahead position? (ES >> GO TO 2. NO >> Steer the steering wheel to the straight-ahe ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III. Turn the ignition switch ON. CAUTION: Never start engine.	ition. ad position. Stop the vehicle. GLE SENSOR
Ijusted other than with CONSULT-III.) CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead posi- bes the vehicle stay in the straight-ahead position? (ES >> GO TO 2. IO >> Steer the steering wheel to the straight-ahe ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III. Turn the ignition switch ON. CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE	ition. ad position. Stop the vehicle. GLE SENSOR
Ijusted other than with CONSULT-III.) CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead posi- bes the vehicle stay in the straight-ahead position? (ES >> GO TO 2. IO >> Steer the steering wheel to the straight-ahe ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III. Turn the ignition switch ON. CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE Select "START".	ition. ad position. Stop the vehicle. GLE SENSOR
Ijusted other than with CONSULT-III.) CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead posi- bes the vehicle stay in the straight-ahead position? (ES >> GO TO 2. IO >> Steer the steering wheel to the straight-ahe ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III. Turn the ignition switch ON. CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE Select "START". CAUTION: Never touch steering wheel while adjusting steered	ition. ad position. Stop the vehicle. GLE SENSOR
Ijusted other than with CONSULT-III.) CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead posi- bes the vehicle stay in the straight-ahead position? (ES >> GO TO 2. Wo >> Steer the steering wheel to the straight-ahe ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III. Turn the ignition switch ON. CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE Select "START". CAUTION: Never touch steering wheel while adjusting stee After approx. 10 seconds, select "END".	ition. ad position. Stop the vehicle. GLE SENSOR SENSOR ADJUSTMENT" in this order.
Aljusted other than with CONSULT-III.) .CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead posi- bes the vehicle stay in the straight-ahead position? (ES >> GO TO 2. NO >> Steer the steering wheel to the straight-ahe .ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III. Turn the ignition switch ON. CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE Select "START". CAUTION: Never touch steering wheel while adjusting stee After approx. 10 seconds, select "END". Turn ignition switch OFF, and then turn it ON again.	ition. ad position. Stop the vehicle. GLE SENSOR SENSOR ADJUSTMENT" in this order.
Aljusted other than with CONSULT-III.) .CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead posi- bes the vehicle stay in the straight-ahead position? (ES >> GO TO 2. NO >> Steer the steering wheel to the straight-ahe .ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III. Turn the ignition switch ON. CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE Select "START". CAUTION: Never touch steering wheel while adjusting stee After approx. 10 seconds, select "END".	ition. ad position. Stop the vehicle. GLE SENSOR SENSOR ADJUSTMENT" in this order.
Justed other than with CONSULT-III.) CHECK THE VEHICLE STATUS op vehicle with front wheels in the straight-ahead posi- bes the vehicle stay in the straight-ahead position? (ES >> GO TO 2. IO >> Steer the steering wheel to the straight-ahe ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III. Turn the ignition switch ON. CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE Select "START". CAUTION: Never touch steering wheel while adjusting stee After approx. 10 seconds, select "END". Turn ignition switch OFF, and then turn it ON again. CAUTION:	ition. ad position. Stop the vehicle. GLE SENSOR SENSOR ADJUSTMENT" in this order.
djusted other than with CONSULT-III.) .CHECK THE VEHICLE STATUS top vehicle with front wheels in the straight-ahead posi- oes the vehicle stay in the straight-ahead position? YES >> GO TO 2. NO >> Steer the steering wheel to the straight-ahe .ADJUST NEUTRAL POSITION OF STEERING ANG With CONSULT-III. Turn the ignition switch ON. CAUTION: Never start engine. Select "ABS", "WORK SUPPORT" and "ST ANGLE Select "START". CAUTION: Never touch steering wheel while adjusting stee After approx. 10 seconds, select "END". Turn ignition switch OFF, and then turn it ON again. CAUTION:	ition. ad position. Stop the vehicle. GLE SENSOR SENSOR ADJUSTMENT" in this order.

3.CHECK DATA MONITOR

With CONSULT-III.

1. The vehicle is either pointing straight ahead, or the vehicle needs to be moved. Stop when it is pointing straight ahead.

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

[WITH ESP]

< BASIC INSPECTION >

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

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

Is the inspection result normal?

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

4. ERASE SELF-DIAGNOSIS MEMORY

With CONSULT-III.
 Erase Self-diagnosis result of "ABS".

Are the memories erased?

YES >> INSPECTION END

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Logic

DTC	Display Item	Malfunction detected condition	Possible causes
C1101	RR RH SENSOR-1	When an open circuit is detected in rear RH wheel sensor circuit.	
C1102	RR LH SENSOR-1	When an open circuit is detected in rear LH wheel sensor circuit.	Harness or connectorWheel sensor
C1103	FR RH SENSOR-1	When an open circuit is detected in front RH wheel sensor circuit.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	When an open circuit is detected in front LH wheel sensor circuit.	_
	east 10 seconds before con	URE" has been previously conducted, always ducting the next test.	s turn ignition switch OFF and
2 CHE	>> GO TO 2. CK DTC DETECTION		
With	CONSULT-III.		
2. Driv 3. Stop	the engine. Ye the vehicle at approx. 30 the vehicle. form self-diagnosis for "ABS	km/h (19 MPH) or more for approx. 1 minute	
ч. геп	IOTTI Sell-Glagilosis IOT ADC	D.	

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Never check between wheel sensor harness connector terminals.

1.	CHEC	۲N	NΗ	IEELS	SEN	SC	DR	
							-	

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

Is the inspection result normal?

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

2.REPLACE WHEEL SENSOR (1)

With CONSULT-III.

- 1. Replace wheel sensor.
- Front: Refer to BRC-224, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-227, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase Self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Stat the engine.
- 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 6. Stop the vehicle.

BRC-151

INFOID:00000006601882

А

Κ

L

Μ

Ν

Ρ

INFOID:000000006601883

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

7. Perform self-diagnosis for "ABS".

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

YES >> GO TO 3.

NO >> INSPECTION END

3.CHECK CONNECTOR

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

Is the inspection result normal?

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

4.PERFORM SELF-DIAGNOSIS (1)

(B) With CONSULT-III.

- 1. Erase Self-diagnosis result for "ABS".
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Stat the engine.
- 4. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 5. Stop the vehicle.
- 6. Perform self-diagnosis for "ABS".

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

YES >> GO TO 5.

NO >> INSPECTION END

5. CHECK TERMINAL

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

Is the inspection result normal?

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

6. PERFORM SELF-DIAGNOSIS (2)

(B) With CONSULT-III.

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase Self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Stat the engine.
- 6. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 7. Stop the vehicle.
- 8. Perform self-diagnosis for "ABS".
- Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 7.

NO >> INSPECTION END

7.CHECK WHEEL SENSOR HARNESS

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect wheel sensor harness connector.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ESP]

ABS actuator and electronic	ctric unit (control unit)	Wheel se	ensor		
Connector	Terminal	Connector	Terminal	Continuity	
	23	E22 (Front LH wheel)			
-	21	E39 (Front RH wheel)			
E35	26	B44 (Rear LH wheel)	1	Existed	
_	44	B41 ^{*1} (Rear RH wheel)			
	11	B45 ^{*2} (Rear RH wheel)			
*1: 2WD					
*2: 4WD					
Measurement connec	tor and terminal for signa	l circuit			
ABS actuator and ele	ctric unit (control unit)	Wheel se	ensor	Continuity	
Connector	Terminal	Connector	Terminal		
-	27	E22 (Front LH wheel)			
-	12	E39 (Front RH wheel)			
E35	30	B44 (Rear LH wheel)	2	Existed	
	15	B41 ^{*1} (Rear RH wheel) B45 ^{*2} (Rear RH wheel)			
PERFORM SELF	r replace error-dete -DIAGNOSIS (3) I.	ected parts and GO TO			
NO >> Repair o PERFORM SELF With CONSULT-III Connect ABS ac Connect wheel s Erase Self-diagn Turn the ignition Stat the engine. Drive the vehicle Stop the vehicle. Perform self-diag	or replace error-deter -DIAGNOSIS (3) I. ctuator and electric of sensor harness cont nosis result for "ABS switch OFF, and wa e at approx. 30 km/h gnosis for "ABS".	unit (control unit) harnes nector. 5". ait 10 seconds or more. n (19 MPH) or more for	ss connector.		
NO >> Repair of PERFORM SELF With CONSULT-III Connect ABS ac Connect wheel s Erase Self-diagn Turn the ignition Stat the engine. Drive the vehicle. Stop the vehicle. Perform self-diagn DTC "C1101", "C1 YES >> GO TO S NO >> INSPEC	or replace error-deter -DIAGNOSIS (3) I. ctuator and electric is sensor harness cont nosis result for "ABS switch OFF, and wa e at approx. 30 km/h gnosis for "ABS". <u>102", "C1103" or "C</u> 9. TION END	unit (control unit) harnes nector. 5". ait 10 seconds or more. n (19 MPH) or more for	ss connector.		
NO >> Repair o PERFORM SELF With CONSULT-III Connect ABS ac Connect wheel s Erase Self-diagn Turn the ignition Stat the engine. Drive the vehicle. Stop the vehicle. Perform self-diagn DTC "C1101", "C1 YES >> GO TO S NO >> INSPEC REPLACE WHEE	r replace error-deter -DIAGNOSIS (3) I. ctuator and electric is sensor harness com nosis result for "ABS switch OFF, and wa e at approx. 30 km/r gnosis for "ABS". 102", "C1103" or "C 9. TION END EL SENSOR	unit (control unit) harnes nector. 5". ait 10 seconds or more. n (19 MPH) or more for	ss connector.		
NO >> Repair o PERFORM SELF With CONSULT-III Connect ABS ac Connect wheel s Erase Self-diagn Turn the ignition Stat the engine. Drive the vehicle Stop the vehicle. Perform self-diag DTC "C1101", "C1 (ES >> GO TO S NO >> INSPEC REPLACE WHEE With CONSULT-III Replace wheel s Front: Refer to B Rear: Refer to B	r replace error-dete -DIAGNOSIS (3) I. ctuator and electric is sensor harness com nosis result for "ABS switch OFF, and wa e at approx. 30 km/h gnosis for "ABS". 102", "C1103" or "C 9. TION END EL SENSOR I. sensor. <u>BRC-224, "FRONT N</u> <u>RC-227, "REAR WI</u>	unit (control unit) harnes nector. 57. ait 10 seconds or more. n (19 MPH) or more for <u>1104" detected?</u> <u>NHEEL SENSOR : Ren</u>	ss connector. approx. 1 minute.		
NO >> Repair o PERFORM SELF With CONSULT-III Connect ABS ac Connect wheel s Erase Self-diagn Turn the ignition Stat the engine. Drive the vehicle. Stop the vehicle. Perform self-diagn DTC "C1101", "C1 YES >> GO TO S NO >> INSPEC REPLACE WHEE With CONSULT-III Replace wheel s Front: Refer to B Erase Self-diagn Turn the ignition Stat the engine. Drive the vehicle	r replace error-deter -DIAGNOSIS (3) I. ctuator and electric is sensor harness com- nosis result for "ABS switch OFF, and war e at approx. 30 km/r gnosis for "ABS". 102", "C1103" or "C 9. TION END EL SENSOR I. sensor. BRC-224, "FRONT Market switch OFF, and war switch OFF, and war at approx. 30 km/r	unit (control unit) harnes nector. 57. ait 10 seconds or more. n (19 MPH) or more for <u>1104" detected?</u> <u>NHEEL SENSOR : Ren</u>	ss connector. approx. 1 minute.		
NO >> Repair of PERFORM SELF With CONSULT-III Connect ABS ac Connect wheel s Erase Self-diagn Turn the ignition Stat the engine. Drive the vehicle. Stop the vehicle. Perform self-diagn TC "C1101", "C1 YES >> GO TO S NO >> INSPEC REPLACE WHEE With CONSULT-III Replace wheel s Front: Refer to B Rear: Refer to B Erase Self-diagn Turn the ignition Stat the engine. Drive the vehicle. Stop the vehicle. Perform self-diagn	r replace error-deter -DIAGNOSIS (3) I. ctuator and electric is sensor harness com- nosis result for "ABS switch OFF, and war e at approx. 30 km/r gnosis for "ABS". 102", "C1103" or "C 9. TION END EL SENSOR I. sensor. BRC-224, "FRONT Market switch OFF, and war switch OFF, and war at approx. 30 km/r	unit (control unit) harnes nector. 37. ait 10 seconds or more. 10 MPH) or more for 1104" detected? <u>WHEEL SENSOR : Ren</u> <u>HEEL SENSOR : Ren</u> 37. ait 10 seconds or more. 10 MPH) or more for	ss connector. approx. 1 minute.		

NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1105	RR RH SENSOR-2	 When 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: 7.5 V ≥ Rear RH wheel sensor power supply voltage Rear RH wheel sensor power supply voltage: 16 V ≤ 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	RR LH SENSOR-2	 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: 7.5 V ≥ Rear LH wheel sensor power supply voltage Rear LH wheel sensor power supply voltage: 16 V ≤ 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. 	 Harness or connector Wheel sensor ABS actuator and electric unit
C1107	FR RH SENSOR-2	 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: 7.5 V ≥ Front RH wheel sensor power supply voltage. Front RH wheel sensor power supply voltage: 16 V ≤ 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. 	(control unit) • Sensor rotor • Tire
C1108	FR LH SENSOR-2	 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: 7.5 V ≥ Front LH wheel sensor power supply voltage: 16 V ≤ 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. 	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

BRC-154

INFOID:000000006601884

C1105, C1106, C1107, C1108 WHEEL SENSOR
< DTC/CIRCUIT DIAGNOSIS > [WITH ESP]
2. CHECK DTC DETECTION
 With CONSULT-III. Stat the engine. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS". <u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u> YES >> Proceed to <u>BRC-155, "Diagnosis Procedure"</u>. NO >> INSPECTION END
Diagnosis Procedure
CAUTION: Never check between wheel sensor harness connector terminals. 1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM
Check ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-205</u> , "Diagnosis Proce- dure".
Is the inspection result normal?
YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK TIRE
 Turn the ignition switch OFF. Check tire air pressure, wear and size. Refer to <u>WT-9, "Tire Air Pressure"</u>. <u>Is the inspection result normal?</u>
YES >> GO TO 5. NO >> Adjust air pressure or replace tire and GO TO 3.
3.CHECK DATA MONITOR (1)
 Erase Self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. Stat the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".
 NOTE: Set the "DATA MONITOR" recording speed to "10 msec". 5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors. is the difference within 5%, respectively? YES >> GO TO 4.
NO >> GO TO 5.
4.PERFORM SELF-DIAGNOSIS (1)
 With CONSULT-III. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS".
Is DTC "C1105", "C1106", "C1107" or "C1108" detected?
YES >> GO TO 5. NO >> INSPECTION END
5.CHECK WHEEL SENSOR

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

< DTC/CIRCUIT DIAGNOSIS >

3. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.

CAUTION:

Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque.

• Front: Refer to <u>BRC-224, "FRONT WHEEL SENSOR : Exploded View"</u>.

• Rear: Refer to BRC-225, "REAR WHEEL SENSOR : Exploded View".

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 6.

6.REPLACE WHEEL SENSOR (1)

With CONSULT-III.

- 1. Replace wheel sensor.
- Front: Refer to BRC-224. "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-227, "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase Self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Stat the engine.
- 5. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

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

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

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

- YES >> GO TO 7.
- NO >> GO TO 19.

/.PERFORM SELF-DIAGNOSIS (2)

With CONSULT-III.

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

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

YES >> GO TO 19.

NO >> INSPECTION END

8.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 11.

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

9.CHECK DATA MONITOR (2)

(B)With CONSULT-III.

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

NOTE:

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

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

< DTC/CIRCUIT DIAGNOSIS > [WITH ESP]
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ-
ence within 5%. respectively? YES >> GO TO 10.
YES >> GO TO 10. NO >> GO TO 11.
10. PERFORM SELF-DIAGNOSIS (3)
With CONSULT-III.
1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
 Stop the vehicle. Perform self-diagnosis for "ABS".
<u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u>
YES >> GO TO 11.
NO >> INSPECTION END
11. CHECK TERMINAL
1. Turn the ignition switch OFF.
 Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.
Is the inspection result normal?
YES >> GO TO 14.
NO >> Repair or replace error-detected parts and GO TO 12.
12.check data monitor (3)
With CONSULT-III.
 Connect ABS actuator and electric unit (control unit) harness connector. Connect wheel sensor harness connector.
 Erase Self-diagnosis result for "ABS".
4. Turn the ignition switch OFF, and wait 10 seconds or more.
 Stat the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR"
and "RR RH SENSOR".
NOTE: Set the "DATA MONITOP" recording speed to "10 meas"
Set the "DATA MONITOR" recording speed to "10 msec". 7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ-
ence within 5%. respectively? YES >> GO TO 13.
NO >> GO TO 14.
13.perform self-diagnosis (4)
With CONSULT-III.
1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
 Stop the vehicle. Perform self-diagnosis for "ABS".
<u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u>
YES >> GO TO 14.
NO >> INSPECTION END
14. CHECK WHEEL SENSOR HARNESS
1. Turn the ignition switch OFF.
 Disconnect ABS actuator and electric unit (control unit) harness connector. Disconnect wheel sensor harness connector.

3. Disconnect wheel sensor harness connector.

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

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and ele	ectric unit (control unit)			
Connector	Terminal		Continuity	
	23, 27			
E35	21, 12	Ground	Next a fact of	
	26, 30	Ground	Not existed	
	11, 15			
Is the inspection res	ult normal?			
YES >> GO TO				
	or replace error-detec	cted parts and GO T	O 15.	
15. CHECK DATA	MONITOR (4)			
 Connect wheel Erase Self-diag Turn the ignition Stat the engine. Select "ABS" and "RR RH SE NOTE: Set the "DATA N Read a value (v Regarding the defe wheel sensor and the sensor and the	ctuator and electric u sensor harness conn nosis result for "ABS' a switch OFF, and wa nd "DATA MONITOR "NSOR". MONITOR" recording wheel speed) of both <u>rence at 30 km/h (1 ne maximum/minimu</u> <u>pectively?</u> 16.	ector. it 10 seconds or mo ", check "FR LH SE speed to "10 msec' normal wheel senso <u>9 MPH) between th</u>	re. ENSOR", "FR RH SE rs and error-detecting the wheel speed dete	NSOR", "RR LH SENSOR g wheel sensor. cted by the error detecting wheel sensors, is the differ
With CONSULT-I Drive the vehicle Stop the vehicle Perform self-dia <u>Is DTC "C1105", "C</u> YES >> GO TO	II. e at approx. 30 km/h agnosis for "ABS". <u>1106", "C1107" or "C1</u> 17. CTION END	. ,	or approx. 1 minute.	
 Rear: Refer to E Erase Self-diag Turn the ignition Stat the engine. Select "ABS" and "RR RH SE NOTE: 	sensor. BRC-224, "FRONT W BRC-227, "REAR WH nosis result for "ABS" n switch OFF, and wa nd "DATA MONITOR	IEEL SENSOR : Re it 10 seconds or mo ", check "FR LH SE	ENSOR", "FR RH SE	
 Read a value (v Regarding the defe 	vheel speed) of both rence at 30 km/h (1	normal wheel senso 9 MPH) between th	rs and error-detecting	cted by the error detectin
wheel sensor and the	pectively?	m wheel speed det	ected by the normal v	wheel sensors, is the diffe

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

18.PERFORM SELF-DIAGNOSIS (6) []Writh CONSULT-III. 1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. 2. Stop the vehicle. 3. Perform self-diagnosis for "ABS". ISDETC"C1105", "C1100", "C1100" or "C1108" detected? YES > 60 T0 19. NO >> INSPECTION END 19.REPLACE SENSOR ROTOR []Writh CONSULT-III. 1. Replace sensor rotor. - Front: Refer to BRC-224, "FRONT WHEEL SENSOR : Removal and Installation". - Rear: Refer to BRC-227, "REAR WHEEL SENSOR : Removal and Installation". - Rear: Refer to BRC-227, "REAR WHEEL SENSOR : Removal and Installation". - Frase Self-diagnosis result for "ABS". 3. Turn the ignition switch OFF, and wait 10 seconds or more. 4. Stat the engine. 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. 6. Stop the vehicle. 7. Perform self-diagnosis for "ABS". ISDTC"C106", "C1100" or "C1108" detected? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-233, "Removal and Installation". NO >> INSPECTION END	< DTC/CIRCUIT DIAGNOSIS > [WITH ESP]	
 With CONSULT-III. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS". <u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u> YES >> GO TO 19. NO >> INSPECTION END 19. REPLACE SENSOR ROTOR With CONSULT-III. Replace sensor rotor. Front: Refer to <u>BRC-224, "FRONT WHEEL SENSOR : Removal and Installation"</u>. Rear: Refer to <u>BRC-227, "REAR WHEEL SENSOR : Removal and Installation"</u>. Erase Self-diagnosis result for "ABS". Stat the engine. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS". Is DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installation"</u>. 		-
(B)With CONSULT-III. 1. Replace sensor rotor. - Front: Refer to BRC-224, "FRONT WHEEL SENSOR : Removal and Installation". - Rear: Refer to BRC-227, "REAR WHEEL SENSOR : Removal and Installation". 2. Erase Self-diagnosis result for "ABS". 3. Trum the ignition switch OFF, and wait 10 seconds or more. 4. Stat the engine. 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. 6. Stop the vehicle. 7. Perform self-diagnosis for "ABS". Is DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-233, "Removal and Installation". NO >> INSPECTION END	 With CONSULT-III. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS". Is DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> GO TO 19. NO >> INSPECTION END 	
 4. Stat the engine. 5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. 6. Stop the vehicle. 7. Perform self-diagnosis for "ABS". Is DTC "C1106", "C1106", "C1107" or "C1108" detected? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233</u>, "<u>Removal and Installation</u>". NO >> INSPECTION END 	 With CONSULT-III. Replace sensor rotor. Front: Refer to <u>BRC-224, "FRONT WHEEL SENSOR : Removal and Installation"</u>. Rear: Refer to <u>BRC-227, "REAR WHEEL SENSOR : Removal and Installation"</u>. Erase Self-diagnosis result for "ABS". 	-
tion".	 Stat the engine. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS". <u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u> 	
	tion".	•

Ρ

< DTC/CIRCUIT DIAGNOSIS >

C1109 POWER AND GROUND SYSTEM

DTC Logic

[WITH ESP]

INFOID:000000006601886

INEOID:000000006601887

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III.

Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS"

Is DTC "C1109" detected?

YES >> Proceed to <u>BRC-160, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

2. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness. Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1109" detected?

YES >> GO TO 3.

NO >> INSPECTION END

 $\mathbf{3}$. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY

1. Turn the ignition switch OFF.

2. Disconnect ABS actuator and electric unit (control unit) harness connector.

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

ABS actuator and ele	ctric unit (control unit)		Voltage
Connector	Connector Terminal		voltage
E35	16	Ground	Approx. 0 V

4. Turn the ignition switch ON. CAUTION: Never start engine.

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

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH ESP]

	electric unit (control unit)		\/alt=	
Connector	Terminal		-	Voltage	
E35	16	Grou	und	10 – 16 V	
the inspection re	esult normal?				
YES >> GO TO NO >> GO TO	O 4.				
CHECK ABS A	CTUATOR AND EL	ECTRIC UNIT	(CONTROL U	NIT) IGNITION	POWER SUPPLY CIRCUIT
Turn the ignition					
. Check 10 A fu . Disconnect IP	DM E/R harness co	onnector.			
. Check continu	ity between ABS a		ectric unit (con	trol unit) harnes	s connector and IPDM E/R
harness conne	ector.				
ABS actuator and ele	ctric unit (control unit)	IPDM	1 E/R		
Connector	Terminal	Connector	Terminal	Continuity	
E35	16	E15	59	Existed	
. Check for cor	ntinuity between Al	3S actuator a	nd electric uni	t (control unit)	harness connector and the
ground.	,			· · · · · · · · · · · · · · · · · · ·	
		1			
	ctric unit (control unit)	_	Continuity		
Connector	Terminal		,	_	
E35	16	Ground	Not existed	_	
s the inspection re					
	esuit normal?			-	
YES >> Perfor	m trouble diagnosis	s for ignition po	ower supply. R	efer to <u>PG-15, "</u>	Wiring Diagram - IGNITION
YES >> Perfor <u>POWE</u>	m trouble diagnosis <u>ER SUPPLY -"</u>	. .	ower supply. R	efer to <u>PG-15, "</u>	Wiring Diagram - IGNITION
YES >> Perfor <u>POWE</u> NO >> Repair	m trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de	etected parts.			
YES >> Perfor <u>POWE</u> NO >> Repair O.CHECK ABS A	m trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL	etected parts.			
YES >> Perfor <u>POWE</u> NO >> Repair CHECK ABS A Turn the ignitic	m trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF.	etected parts. ECTRIC UNIT	CONTROL L	INIT) GROUND	CIRCUIT
YES >> Perfor <u>POWE</u> NO >> Repair CHECK ABS A Turn the ignitic	m trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF.	etected parts. ECTRIC UNIT	CONTROL L	INIT) GROUND	
YES >> Perfor POWE NO >> Repair CHECK ABS A Turn the ignitio Check continu	m trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF.	etected parts. ECTRIC UNIT	CONTROL L	INIT) GROUND	CIRCUIT
YES >> Perfor POWE NO >> Repair CHECK ABS A Turn the ignitio Check continu	m trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. ity between ABS a	etected parts. ECTRIC UNIT	CONTROL L	INIT) GROUND	CIRCUIT
YES >> Perfor POWE NO >> Repair CHECK ABS A Turn the ignitic Check continu ABS actuator and ele Connector	m trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. hity between ABS ar	etected parts. ECTRIC UNIT	Continuity	INIT) GROUND	CIRCUIT
YES >> Perfor <u>POWE</u> NO >> Repain CHECK ABS A Turn the ignitic Check continu ABS actuator and ele	m trouble diagnosis <u>R SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. ity between ABS ac ectric unit (control unit) Terminal	etected parts. ECTRIC UNIT	CONTROL L	INIT) GROUND	CIRCUIT
YES >> Perfor POWE NO >> Repair O.CHECK ABS A Turn the ignitic Check continu ABS actuator and ele Connector	m trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. hity between ABS ac ectric unit (control unit) Terminal 3 4	etected parts. ECTRIC UNIT	Continuity	INIT) GROUND	CIRCUIT
YES >> Perfor <u>POWE</u> NO >> Repain CHECK ABS A Turn the ignitic Check continu ABS actuator and ele Connector E35 the inspection re YES >> GO TO	rm trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. ity between ABS ar ectric unit (control unit) Terminal 3 4 esult normal? D 6.	etected parts. ECTRIC UNIT ctuator and ele Ground	Continuity	INIT) GROUND	CIRCUIT
YES >> Perfor <u>POWE</u> NO >> Repain CHECK ABS A Turn the ignitic Check continu ABS actuator and ele Connector E35 the inspection re YES >> GO TO	m trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. ity between ABS ar ectric unit (control unit) Terminal 3 4 esult normal?	etected parts. ECTRIC UNIT ctuator and ele Ground	Continuity	INIT) GROUND	CIRCUIT
YES >> Perfor <u>POWE</u> NO >> Repair CHECK ABS A Turn the ignitic Check continue ABS actuator and ele Connector E35 the inspection re YES >> GO TO NO >> Repair	rm trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. hity between ABS ac ectric unit (control unit) Terminal 3 4 esult normal? D 6. r or replace error-de	etected parts. ECTRIC UNIT ctuator and ele Ground	Continuity	INIT) GROUND	CIRCUIT
YES >> Perfor <u>POWE</u> NO >> Repain D.CHECK ABS A Turn the ignitic Check continu ABS actuator and ele <u>Connector</u> E35 <u>S the inspection re</u> YES >> GO TO NO >> Repain D.CHECK TERMI	rm trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. ity between ABS ac ectric unit (control unit) Terminal 3 4 esult normal? O 6. r or replace error-de INAL	etected parts. ECTRIC UNIT ctuator and ele Ground	Continuity Existed	JNIT) GROUND rol unit) harness —	CIRCUIT
YES >> Perfor <u>POWE</u> NO >> Repain CHECK ABS A . Turn the ignitic . Check continu ABS actuator and ele <u>Connector</u> E35 <u>Sthe inspection re</u> YES >> GO TC NO >> Repain CHECK TERMI Check ABS actuances ness connector.	rm trouble diagnosis <u>R SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. ity between ABS ac- ectric unit (control unit) Terminal 3 4 esult normal? D 6. r or replace error-de INAL lator and electric unit	etected parts. ECTRIC UNIT ctuator and ele Ground etected parts.	t) pin terminals	JNIT) GROUND rol unit) harness s for damage or	CIRCUIT s connector and ground.
YES >> Perfor <u>POWE</u> NO >> Repain CHECK ABS A Turn the ignitic Check continu ABS actuator and ele Connector E35 the inspection re YES >> GO TC NO >> Repain CHECK TERMI Check ABS actu ness connector. Check IPDM E/R	rm trouble diagnosis <u>R SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. ity between ABS ar ectric unit (control unit) Terminal 3 4 esult normal? O 6. r or replace error-de INAL lator and electric unit R pin terminals for d	etected parts. ECTRIC UNIT ctuator and ele Ground etected parts.	t) pin terminals	JNIT) GROUND rol unit) harness s for damage or	CIRCUIT s connector and ground.
YES >> Perfor <u>POWE</u> NO >> Repain D.CHECK ABS A Turn the ignitic Check continu ABS actuator and ele Connector E35 Sthe inspection re YES >> GO TO NO >> Repain D.CHECK TERMI Check ABS actu ness connector. Check IPDM E/R Sthe inspection re	rm trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. ity between ABS ac ectric unit (control unit) Terminal 3 4 esult normal? O 6. r or replace error-de INAL ator and electric unit R pin terminals for de esult normal?	etected parts. ECTRIC UNIT ctuator and ele 	t) pin terminals	JNIT) GROUND rol unit) harness 	CIRCUIT s connector and ground.
YES >> Perfor <u>POWE</u> NO >> Repain D.CHECK ABS A Turn the ignitic Check continu ABS actuator and ele Connector E35 Sthe inspection re YES >> GO TO NO >> Repain D.CHECK TERMI Check ABS actu ness connector. Check IPDM E/R Sthe inspection re	rm trouble diagnosis <u>ER SUPPLY -"</u> . r or replace error-de CTUATOR AND EL on switch OFF. ity between ABS ac ectric unit (control unit) Terminal 3 4 esult normal? O 6. r or replace error-de INAL ator and electric unit R pin terminals for de esult normal?	etected parts. ECTRIC UNIT ctuator and ele 	t) pin terminals	JNIT) GROUND rol unit) harness 	CIRCUIT s connector and ground.

C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < DTC/CIRCUIT DIAGNOSIS > [WITH ESP]

C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Logic

INFOID:000000006601888

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS ac- tuator and electric unit (control unit).	ABS actuator and electric unit
C1170	VARIANT CODING	When the information in ABS actuator and electric unit (control unit) is not the same.	(control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

(B) With CONSULT-III.

Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS".

Is DTC "C1110" or "C1170" detected?

YES >> Proceed to <u>BRC-162</u>, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006601889

1.CHECK SELF-DIAGNOSIS RESULTS

Replace ABS actuator and electric unit (control unit) even if other display than "C1110" or "C1170" is displayed in self-diagnosis for "ABS".

>> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> tion".

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Logic

[WITI

INFOID:000000006601890

А

DTC	Display Item	Malfunction detected condition	Possible causes
C1111	PUMP MOTOR	When a malfunction is detected in motor or motor re- lay.	 Harness or connector ABS actuator and electric uni (control unit) Fusible link Battery power supply system
DTC C	ONFIRMATION PROC	EDURE	
1. pre	CONDITIONING		
If "DTC	CONFIRMATION PROC	EDURE" has been previously conducted, always	turn ignition switch OFF ar
wait at l	east 10 seconds before of	conducting the next test.	-
	>> GO TO 2.		
2 сне	CK DTC DETECTION		
	CONSULT-III.		
1. Tur	n the ignition switch OFF		
	form self-diagnosis for "A	BS".	
	"C1111" detected?		
YES NO		3. "Diagnosis Procedure".	
YES NO	>> Proceed to BRC-163	3, "Diagnosis Procedure".	INFOID:0000000660
YES NO Diagn	>> Proceed to <u>BRC-163</u> >> INSPECTION END	3, "Diagnosis Procedure".	INFOID:00000000660
YES NO Diagn 1.CHE	>> Proceed to <u>BRC-163</u> >> INSPECTION END osis Procedure CK CONNECTOR n the ignition switch OFF.		
YES NO Diagn 1.CHE 1. Tur 2. Che	>> Proceed to <u>BRC-163</u> >> INSPECTION END osis Procedure CK CONNECTOR n the ignition switch OFF. eck ABS actuator and ele		
YES NO Diagn 1.CHE 1. Tur 2. Cho Is the in	>> Proceed to <u>BRC-163</u> >> INSPECTION END osis Procedure CK CONNECTOR n the ignition switch OFF eck ABS actuator and ele spection result normal?		
YES NO Diagn 1.CHE 1. Tur 2. Che	>> Proceed to <u>BRC-163</u> >> INSPECTION END osis Procedure CK CONNECTOR n the ignition switch OFF eck ABS actuator and ele <u>spection result normal?</u> >> GO TO 3.		connection or looseness.
YES NO Diagn 1.CHE 1. Tur 2. Che Is the in YES NO	>> Proceed to <u>BRC-163</u> >> INSPECTION END osis Procedure CK CONNECTOR n the ignition switch OFF eck ABS actuator and ele <u>spection result normal?</u> >> GO TO 3.	ctric unit (control unit) harness connector for disc ror-detected parts, securely lock the connector, a	connection or looseness.
YES NO Diagn 1.CHE 1. Tur 2. Che Is the in YES NO 2.PER	>> Proceed to <u>BRC-163</u> >> INSPECTION END Osis Procedure CK CONNECTOR In the ignition switch OFF, eck ABS actuator and ele <u>spection result normal?</u> >> GO TO 3. >> Repair or replace en	ctric unit (control unit) harness connector for disc ror-detected parts, securely lock the connector, a S	connection or looseness.
YES NO Diagn 1.CHE 1. Tur 2. Cho Is the in YES NO 2.PER Perform Is DTC	>> Proceed to <u>BRC-163</u> >> INSPECTION END Osis Procedure CK CONNECTOR In the ignition switch OFF eck ABS actuator and ele <u>ispection result normal?</u> >> GO TO 3. >> Repair or replace end FORM SELF-DIAGNOSI i self-diagnosis for "ABS" <u>"C1111" detected?</u>	ctric unit (control unit) harness connector for disc ror-detected parts, securely lock the connector, a S	connection or looseness.
YES NO Diagn 1.CHE 1. Tur 2. Che Is the in YES NO 2.PER Perform Is DTC YES	>> Proceed to BRC-163 >> INSPECTION END Osis Procedure CK CONNECTOR In the ignition switch OFF. Eack ABS actuator and ele Ispection result normal? >> GO TO 3. >> Repair or replace err FORM SELF-DIAGNOSI In self-diagnosis for "ABS" "C1111" detected? >> GO TO 3.	ctric unit (control unit) harness connector for disc ror-detected parts, securely lock the connector, a S	connection or looseness.
YES NO Diagn 1.CHE 1. Tur 2. Che Is the in YES NO 2.PER Perform Is DTC YES NO	>> Proceed to BRC-163 >> INSPECTION END OSIS Procedure CK CONNECTOR In the ignition switch OFF. eck ABS actuator and ele spection result normal? >> GO TO 3. >> Repair or replace en FORM SELF-DIAGNOSI In self-diagnosis for "ABS" "C1111" detected? >> GO TO 3. >> INSPECTION END	ctric unit (control unit) harness connector for disc ror-detected parts, securely lock the connector, a S again.	connection or looseness.
YES NO Diagn 1.CHE 1. Tur 2. Che Is the in YES NO 2.PER Perform Is DTC YES NO 3.CHE	>> Proceed to BRC-163 >> INSPECTION END OSIS Procedure CK CONNECTOR In the ignition switch OFF. Eack ABS actuator and ele Ispection result normal? >> GO TO 3. >> Repair or replace err FORM SELF-DIAGNOSI In self-diagnosis for "ABS" "C1111" detected? >> GO TO 3. >> INSPECTION END CK ABS MOTOR AND M	ctric unit (control unit) harness connector for disc ror-detected parts, securely lock the connector, a S again.	connection or looseness.
YES NO Diagn 1.CHE 1. Tur 2. Che Is the in YES NO 2.PER Perform IS DTC YES NO 3.CHE 1. Tur	>> Proceed to BRC-163 >> INSPECTION END OSIS Procedure CK CONNECTOR In the ignition switch OFF. eck ABS actuator and ele spection result normal? >> GO TO 3. >> Repair or replace err FORM SELF-DIAGNOSI In self-diagnosis for "ABS" <u>"C1111" detected?</u> >> GO TO 3. >> INSPECTION END CK ABS MOTOR AND M In the ignition switch OFF.	ctric unit (control unit) harness connector for disc ror-detected parts, securely lock the connector, a S again.	connection or looseness.

ABS actuator and ele	ctric unit (control unit)		Voltage
Connector	Connector Terminal		voltage
E35	1	Ground	10 – 16 V

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

BRC-163

[WITH ESP]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		voltage
E35	1	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-10, "Wiring Diagram - BATTERY</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

${f 5.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

1. Turn the ignition switch OFF.

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

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E35	3	Ground	Existed
200	4	Ground	Existed

Is the inspection result normal?

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

6.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

DTC Logic

[WITH ESP]

INFOID:000000006385977

INFOID:00000006385978

Κ

L

Μ

Ρ

А

В

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1113	G SENSOR	When a malfunction is detected in decel G signal, or sig- nal line of yaw rate/side/decel G sensor is open or short- ed.	Harness or connector
C1145	YAW RATE SENSOR	When a malfunction is detected in yaw rate signal, or sig- nal line of yaw rate/side/decel G sensor is open or short- ed.	 Yaw rate/side/decel G sensor ABS actuator and electric unit (control unit)
C1146	SIDE G-SEN CIRCUIT	When a malfunction is detected in side G signal, or signal line of yaw rate/side/decel G sensor is open or shorted.	
отс сс	ONFIRMATION PROC	EDURE	
.PREC	CONDITIONING		
f "DTC (CONFIRMATION PROC	EDURE" has been previously conducted, always t	urn ignition switch OFF and
f "DTC (CONFIRMATION PROC	EDURE" has been previously conducted, always t conducting the next test.	urn ignition switch OFF and
f "DTC (CONFIRMATION PROC		urn ignition switch OFF and

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

Is DTC "C1113" "C1145" or "C1146" detected?

- YES >> Proceed to <u>BRC-165, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

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

Check ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-205, "Diagnosis Proce-dure"</u>. Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK CONNECTOR

Turn ignition switch OFF.
 Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
 Check yaw rate/side/decel G sensor harness connector for disconnection or looseness.
 Is the inspection result normal?
 YES >> GO TO 4.
 NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 3.

3.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC"C1113", "C1145" or "C1146" detected?

YES >> GO TO 4.

NO >> INSPECTION END

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

1. Turn ignition switch OFF.

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

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

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E35	13	B38	4	Existed	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

 ${f 5.}$ CHECK YAW RATE/SIDE/DECEL G SENSOR GROUND SIRCUIT

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

ABS actuator and electric unit (control unit)		Yaw rate/side/	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E35	28	B38	2	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK YAW RATE/SIDE/DECEL G SENSOR SIGNAL CIRCUIT

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

ABS actuator and ele	and electric unit (control unit) Yaw rate/side/decel G sens		decel G sensor	Continuity
Connector	Terminal	Connector	Connector Terminal	
E35	14	B38	5	Existed
	29	- 550	6	

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

I.CHECK YAW RATE/SIDE/DECEL G SENSOR CIRCUIT

Check continuity between each terminals of yaw rate/side/decel G sensor harness connector.

Yaw rate/side/decel G sensor		Continuity
Connector	Connector Terminal	
	2 – 4	
	2 – 5	
B38	2 - 6	Not existed
B30	4 – 5	NOT EXISTED
	4 - 6	
	5 - 6	

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8.CHECK YAW RATE/SIDE/DECEL G SENSOR 1

With CONSULT-III.

1. Connect yaw rate/side/decel G sensor harness connector.

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 2. Connect ABS actuator and electric unit (control unit) harness connector.
- 3. Turn the ignition switch ON.
- 4. Select "ABS", "DATA MONITOR" and "DECEL G-SEN" in order.
- 5. Move yaw rate/side/decel G sensor as shown in the figure to check the output of before and after moving the sensor.

Condition	DATA MONITOR
Horizontal	Approx. 0 G
Vertical	Approx. +1 G

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-</u> 235. "Removal and Installation".

9. CHECK YAW RATE/SIDE/DECEL G SENSOR 2

- 1. Turn ignition switch OFF.
- 2. Connect following terminals between yaw rate/side/decel G sensor and harness connector.

	Yaw rate/side/decel G	Harness connector		
	sensor	Connector	Terminal	
	2	B38	2	
-	4		4	
-	5		5	
	6		6	

3. Turn ignition switch ON.

CAUTION:

Never start the engine.

 Check voltage between yaw rate/side/decel G sensor harness connector terminals. CAUTION:

Never short out the terminals while measuring voltages.

Yaw rate/side/decel G sensor		Voltage
connector	Terminal	voltage
B38	5 – 2	2.5 – 4.5 V
	6 – 2	0.5 – 2.5 V

Is the inspection result normal?

YES >> Replace ABS actuator end electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> ^M <u>tion"</u>.

NO >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-235. "Removal and Installation"</u>.

Ν

0



B C JSFIA0098ZZ

Ε

BRC

Н

А

[WITH ESP]

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1115 WHEEL SENSOR

DTC Logic

INFOID:000000006601892

INFOID:000000006601893

[WITH ESP]

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III.

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

Is DTC "C1115" detected?

- YES >> Proceed to <u>BRC-168, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

For wheel sensor, never check between terminals.

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

Check ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-205. "Diagnosis Proce-</u> dure".

Is the inspection result normal?

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

2.CHECK TIRE

- 1. Turn the ignition switch OFF.
- 2. Check tire air pressure, wear and size. Refer to <u>WT-9, "Tire Air Pressure"</u>.
- Is the inspection result normal?
- YES >> GO TO 5.
- NO >> Adjust air pressure or replace tire and GO TO 3.

3.CHECK DATA MONITOR (1)

(B) With CONSULT-III.

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

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH ESP]

Set the "DATA MONITOR" recording speed to "10 msec". 5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.	А
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ-	
ence within 5%, respectively?	В
YES >> GO TO 4. NO >> GO TO 5.	
4.PERFORM SELF-DIAGNOSIS (1)	С
With CONSULT-III.	
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. 	D
3. Perform self-diagnosis for "ABS".	
Is DTC "C1115" detected?	Е
YES >> GO TO 5. NO >> INSPECTION END	
5. CHECK WHEEL SENSOR	
1. Turn the ignition switch OFF.	BRC
 Check wheel sensor for damage. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole. CAUTION: 	G
Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque. • Front: Refer to <u>BRC-224, "FRONT WHEEL SENSOR : Exploded View"</u> . • Rear: Refer to <u>BRC-225, "REAR WHEEL SENSOR : Exploded View"</u> .	Η
Is the inspection result normal?	
YES >> GO TO 8.	I
NO $>>$ GO TO 6.	
6. REPLACE WHEEL SENSOR (1)	J
 Replace wheel sensor. Front: Refer to <u>BRC-224, "FRONT WHEEL SENSOR : Removal and Installation"</u>. 	Κ
- Rear: Refer to <u>BRC-227, "REAR WHEEL SENSOR : Removal and Installation"</u> .	
 Erase Self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. 	L
4. Stat the engine.	
 Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR". 	
NOTE:	M
Set the "DATA MONITOR" recording speed to "10 msec". 6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.	
Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting	Ν
wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the differ- ence within 5%, respectively?	
YES >> GO TO 7.	0
NO >> GO TO 19.	
PERFORM SELF-DIAGNOSIS (2)	
With CONSULT-III.	Ρ
 Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. 	
3. Perform self-diagnosis for "ABS".	
Is DTC "C1115" detected?	
YES >> GO TO 19. NO >> INSPECTION END	

< DTC/CIRCUIT DIAGNOSIS >

8. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 11.

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

9.CHECK DATA MONITOR (2)

With CONSULT-III.

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

NOTE:

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

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

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

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

10.PERFORM SELF-DIAGNOSIS (3)

(B) With CONSULT-III.

- T. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
- 2. Stop the vehicle.
- 3. Perform self-diagnosis for "ABS".
- Is DTC "C1115" detected?
- YES >> GO TO 11.
- NO >> INSPECTION END
- **11.**CHECK TERMINAL
- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.

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

12. CHECK DATA MONITOR (3)

()With CONSULT-III.

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

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

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

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

< DTC/CIRCUIT DIAGNOSIS >	[WITH ESP
YES >> GO TO 13. NO >> GO TO 14.	
13. PERFORM SELF-DIAGNOSIS (4)	
 With CONSULT-III. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS". 	
<u>Is DTC "C1115" detected?</u> YES >> GO TO 14.	
NO >> INSPECTION END	
14.CHECK WHEEL SENSOR HARNESS	

А

В

D

Ε

BRC

Ρ

1. Turn the ignition switch OFF.

- Disconnect ABS actuator and electric unit (control unit) harness connector. 2.
- 3. Disconnect wheel sensor harness connector.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

Measurement connector and terminal for power supply circuit

ABS actuator and electric unit (control unit) Wheel sensor		ensor	Continuity	G	
Connector	Terminal	Connector	Terminal	Continuity	-
	23	E22 (Front LH wheel)			
	21	E39 (Front RH wheel)			Н
E35	26	B44 (Rear LH wheel)	1	Existed	
	11	B41 ^{*1} (Rear RH wheel) B45 ^{*2} (Rear RH wheel)			I

*1: 2WD

*2: 4WD

Measurement connector and terminal for signal circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity		
Connector	Terminal	Connector	Terminal	Continuity		
	27	E22 (Front LH wheel)				
	12	E39 (Front RH wheel)				
E35	30	B44 (Rear LH wheel)	2	Existed		
	15	B41 ^{*1} (Rear RH wheel) B45 ^{*2} (Rear RH wheel)				

*1: 2WD *2: 4WD

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

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal		Continuity
E35	23, 27	Ground	Not existed
	21, 12		
	26, 30		
	11, 15		

Is the inspection result normal?

YES >> GO TO 15.

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

< DTC/CIRCUIT DIAGNOSIS >

15. CHECK DATA MONITOR (4)

With CONSULT-III.

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

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

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

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

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

16.PERFORM SELF-DIAGNOSIS (5)

(B) With CONSULT-III.

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

Is DTC "C1115" detected?

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

17.REPLACE WHEEL SENSOR

With CONSULT-III.

- 1. Replace wheel sensor.
- Front: Refer to BRC-224, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-227. "REAR WHEEL SENSOR : Removal and Installation".
- 2. Erase Self-diagnosis result for "ABS".
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Stat the engine.
- 5. Select "ABŠ" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

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

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

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

- YES >> GO TO 18.
- NO >> GO TO 19.
- **18.**PERFORM SELF-DIAGNOSIS (6)

With CONSULT-III.

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

Is DTC "C1115" detected?

YES >> GO TO 19.

NO >> INSPECTION END

19.REPLACE SENSOR ROTOR

(B) With CONSULT-III.

1. Replace sensor rotor.

C1115 WHEEL SENSOR

< DTC/CIF	RCUIT DIAGNOSIS >		
	Refer to <u>BRC-224, "FRONT WHEEL SENSOR : Removal and Installation"</u> . Refer to <u>BRC-227</u> , "REAR WHEEL SENSOR : Removal and Installation".		А
2. Erase	Self-diagnosis result for "ABS".		
-	he ignition switch OFF, and wait 10 seconds or more.		
	ne engine.		В
	the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. he vehicle.		
	m self-diagnosis for "ABS".		
Is DTC "C1	1115" detected?		С
YES >:	> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233. "Removition"</u> .	al and Installa-	
NO >:	> INSPECTION END		D

Ε

Н

I

J

Κ

L

Μ

Ν

Ο

Ρ

G

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

C1116 STOP LAMP SWITCH

DTC Logic

INFOID:000000006386069

INFOID-000000006386070

[WITH ESP]

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C1116	STOP LAMP SW	When stop lamp switch signal is not input when brake pedal operates.	 Harness or connector Stop lamp switch ABS actuator and electric unit (control unit) Battery power supply system

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III.

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

Is DTC "C1116" detected?

YES >> Proceed to <u>BRC-174, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

NOTE:

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

1.INTERVIEW FROM THE CUSTOMER

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

Is there such a history?

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

2. PERFORM SELF-DIAGNOSIS

With CONSULT-III.

- 1. Erase Self-diagnosis result for "ABS".
- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Start the engine. CAUTION: Never start the vehicle.
- 4. Depress the brake pedal several times.
- 5. Perform self-diagnosis for "ABS".

Is DTC "C1116" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3.STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamp turns ON. Does stop lamp turn ON?

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS > [WITH ESP]	
YES >> GO TO 5. NO >> Check stop lamp system. Refer to <u>EXL-39, "Wiring Diagram"</u> . GO TO 4.	А
4.CHECK DATA MONITOR (1)	
 With CONSULT-III. Erase Self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. 	В
CAUTION:	С
 Never start the vehicle. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-136. "Reference Value"</u>. 	D
Is the inspection result normal? YES >> INSPECTION END NO >> GO TO 5.	E
5. CHECK STOP LAMP SWITCH CLEARANCE	
 Turn the ignition switch OFF. Check stop lamp switch clearance. LHD: Refer to <u>BR-9, "Inspection and Adjustment"</u>. RHD: Refer to <u>BR-77, "Inspection and Adjustment"</u>. 	BR
Is the inspection result normal?	G
 YES >> GO TO 7. NO >> Adjust stop lamp switch clearance. GO TO 6. LHD: Refer to <u>BR-77, "Inspection and Adjustment"</u>. RHD: Refer to <u>BR-77, "Inspection and Adjustment"</u>. 	Н
6.CHECK DATA MONITOR (2)	
 With CONSULT-III. Erase Self-diagnosis result for "ABS". Turn the ignition switch OFF and wait 10 accords or more. 	
 Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. CAUTION: 	J
 Never start the vehicle. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-136</u>, "<u>Reference Value</u>". 	Κ
Is the inspection result normal? YES >> INSPECTION END NO >> GO TO 7.	L
7. CHECK STOP LAMP SWITCH	
Check stop lamp switch. Refer to <u>BRC-177, "Component Inspection"</u> .	M
Is the inspection result normal?	
 YES >> GO TO 9. NO >> Replace stop lamp switch. GO TO 8. LHD: Refer to <u>BR-21, "Removal and Installation"</u>. RHD: Refer to <u>BR-89, "Removal and Installation"</u>. 	Ν
8. CHECK DATA MONITOR (3)	0
 With CONSULT-III. Erase Self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. Start the engine. CAUTION: 	Ρ

Never start the vehicle.

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to BRC-136, "Reference Value".

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

[WITH ESP]

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

 γ >> GO 10 9.

9.CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

YES >> GO TO 11.

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

10.CHECK DATA MONITOR (4)

With CONSULT-III.

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect stop lamp switch harness connector.
- 3. Erase Self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine. CAUTION:

Never start the vehicle.

6. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-136</u>, "<u>Reference Value</u>".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 11.

11.CHECK STOP LAMP SWITCH CIRCUIT (1)

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

ABS actuator and electric unit (control unit)			Condition	Voltage
Connector	Terminal	—	Condition	voltage
E25	0	Ground	Brake pedal depressed	Battery voltage
E35	0		Brake pedal not depressed	Approx. 0 V

4. Turn the ignition switch ON.

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

ABS actuator and electric unit (control unit)			Condition	Voltage	
Connector	Terminal	—	Condition	voltage	
E35	8 6	Ground	Brake pedal depressed	Battery voltage	
235	0	Cround	Brake pedal not depressed	Approx. 0 V	

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts. GO TO 12.

12. CHECK STOP LAMP SWITCH CIRCUIT (2)

1. Turn the ignition switch OFF.

2. Disconnect stop lamp switch harness connector.

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

 Check continuity between ABS actuator and electric unit (control unit) harness connector and stop lamp switch harness connector.

ABS actuator and electric unit (control unit)		Stop lamp switch		- Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E35	8	E102 ^{*1} E118 ^{*2} M205 ^{*3}	2	Existed	

*1: Models with CVT

*2: LHD models with M/T

*3: RHD models with M/T

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

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal	—	Continuity	
E35	8	Ground	Not existed	_

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts. GO TO 13.

13. CHECK DATA MONITOR (5)

With CONSULT-III.

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect stop lamp switch harness connector.
- 3. Erase Self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.

CAUTION:

Never start the vehicle.

 Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-136, "Reference Value"</u>.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> tion".

Component Inspection

INFOID:000000006386071

M

Ν

Ρ

Κ

1.CHECK STOP LAMP SWITCH 1. Turn the ignition switch OFF.

- Disconnect stop lamp switch harness connector.
- 3. Check continuity when stop lamp switch is operated.

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

Is the inspection result normal?

NO

YES >> INSPECTION END

>> Replace stop lamp switch.

• LHD: Refer to BR-21, "Removal and Installation".

[WITH ESP]

А

В

D

Н

< DTC/CIRCUIT DIAGNOSIS >

• RHD: Refer to <u>BR-89, "Removal and Installation"</u>.

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Logic

[WITH ESP]

INFOID:000000006601894

DTC D	ETECTION LOGIC			В
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.		С
C1122	FR RH IN ABS SOL	When a malfunction is detected in front RH ABS IN valve.	Harness or connector ABS actuator and electric unit (control unit)	D
C1124	RR LH IN ABS SOL	When a malfunction is detected in rear LH ABS IN valve.	 (control unit) Fusible link Battery power supply system 	
C1126	RR RH IN ABS SOL	When a malfunction is detected in rear RH ABS IN valve.		E
	ONFIRMATION PROC	CEDURE		BR
		CEDURE" has been previously conducted, alway conducting the next test.	vs turn ignition switch OFF and	G
2.сне	>> GO TO 2. CK DTC DETECTION			Н
1. Turi 2. Per	CONSULT-III n the ignition switch OF form self-diagnosis for "	ABS".		
YES NO		24" or "C1126" detected? 79. "Diagnosis Procedure".		J
Diagno	osis Procedure		INFOID:00000006601895	
1. CHE	CK CONNECTOR			K
2. Che <u>Is the in</u>	spection result normal?	ectric unit (control unit) harness connector for di	sconnection or looseness.	L
VES NO 2. PER	>> GO TO 3. >> Repair or replace e FORM SELF-DIAGNOS	rror-detected parts, securely lock the connector,	and GO TO 2.	M
	self-diagnosis for "ABS "C1120", "C1122", "C112 >> GO TO 3.	" again. 24" or "C1126" detected?		Ν
NO	>> INSPECTION END CK ABS IN VALVE POV			0
1. Turi	n the ignition switch OF			Ρ

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		voltage
E35	2	Ground	10 – 16 V

BRC-179

A

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

[WITH ESP]

< DTC/CIRCUIT DIAGNOSIS >

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal		voltage	
E35	2	Ground	10 – 16 V	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK ABS IN VALVE POWER SUPPLY CIRCUIT

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

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-10, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

5. CHECK ABS IN VALVE GROUND CIRCUIT

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

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal			
E35	3	Ground	Existed	
233	4	Ground	LAISIEU	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233. "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Logic

[WITH ESP]

INFOID:000000006601896

	Display Item	Malfunction detected condition	Possible causes
C1121	FR LH OUT ABS SOL	When a malfunction is detected in front LH ABS OUT valve.	
C1123	FR RH OUT ABS SOL	When a malfunction is detected in front RH ABS OUT valve.	 Harness or connector ABS actuator and electric un (control unit)
C1125	RR LH OUT ABS SOL	When a malfunction is detected in rear LH ABS OUT valve.	(control unit)Fusible linkBattery power supply system
C1127	RR RH OUT ABS SOL	When a malfunction is detected in rear RH ABS OUT valve.	
ртс со	ONFIRMATION PROCE	EDURE	
1. PRE(CONDITIONING		
	CONFIRMATION PROCE east 10 seconds before c	EDURE" has been previously conducted, always onducting the next test.	turn ignition switch OFF a
0	>> GO TO 2.		
	CK DTC DETECTION		
	CONSULT-III		
	n the ignition switch OFF form self-diagnosis for "A		
	<u>'C1121", "C1123", "C1125</u>		
YES	>> Proceed to <u>BRC-181</u>	<u>, "Diagnosis Procedure"</u> .	
NO	>> INSPECTION END		
	osis Procedure		INFOID:00000000660
Diagno			
	CK CONNECTOR		
1. CHE	CK CONNECTOR	ntria unit (control unit) hornoon connector for dia	
1. CHE 1. Turr 2. Che	CK CONNECTOR In the ignition switch OFF. eck ABS actuator and elec	ctric unit (control unit) harness connector for disc	
1. CHE 1. Turr 2. Che Is the ins	CK CONNECTOR	ctric unit (control unit) harness connector for disc	
1.CHE 1. Turr 2. Che <u>Is the ins</u> YES NO	CK CONNECTOR the ignition switch OFF. eck ABS actuator and elect spection result normal? >> GO TO 3. >> Repair or replace error	or-detected parts, securely lock the connector, a	connection or looseness.
1.CHE 1. Turr 2. Che <u>Is the ins</u> YES NO	CK CONNECTOR In the ignition switch OFF. eck ABS actuator and elect spection result normal? >> GO TO 3.	or-detected parts, securely lock the connector, a	connection or looseness.
1.CHE 1. Turr 2. Che <u>Is the ins</u> YES NO 2.PERF	CK CONNECTOR the ignition switch OFF. eck ABS actuator and elect spection result normal? >> GO TO 3. >> Repair or replace error	or-detected parts, securely lock the connector, a	connection or looseness.
1.CHE 1. Turr 2. Che <u>Is the ins</u> YES NO 2.PERF Perform <u>Is DTC "</u>	CK CONNECTOR the ignition switch OFF. eck ABS actuator and elect spection result normal? >> GO TO 3. >> Repair or replace error FORM SELF-DIAGNOSIS self-diagnosis for "ABS" 'C1121", "C1123", "C1125	or-detected parts, securely lock the connector, a S again.	connection or looseness.
1.CHEC 1. Turr 2. Che <u>Is the ins</u> YES NO 2.PERF Perform <u>Is DTC "</u> YES	CK CONNECTOR the ignition switch OFF. eck ABS actuator and elect spection result normal? >> GO TO 3. >> Repair or replace error FORM SELF-DIAGNOSIS self-diagnosis for "ABS" <u>'C1121", "C1123", "C1125</u> >> GO TO 3.	or-detected parts, securely lock the connector, a S again.	connection or looseness.
1.CHEC 1. Turr 2. Che <u>Is the ins</u> YES NO 2.PERF Perform <u>Is DTC "</u> YES NO	CK CONNECTOR the ignition switch OFF. eck ABS actuator and elect spection result normal? >> GO TO 3. >> Repair or replace error FORM SELF-DIAGNOSIS self-diagnosis for "ABS" 'C1121", "C1123", "C1125	or-detected parts, securely lock the connector, a S again. <u>" or "C1127" detected?</u>	connection or looseness.

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

ABS actuator and	electric unit (control unit)		Voltage
Connector	Connector Terminal		voltage
E35	2	Ground	10 – 16 V

А

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

[WITH ESP]

< DTC/CIRCUIT DIAGNOSIS >

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Terminal		voltage
E35	2	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

CHECK ABS OUT VALVE POWER SUPPLY CIRCUIT

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

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-10, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

5. CHECK ABS OUT VALVE GROUND CIRCUIT

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

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal			
E35	3	Ground	Existed	
200	4	Globalia	Existed	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233</u>, "<u>Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

C1130 ENGINE SIGNAL

DTC Logic

INFOID:000000006386145

DTC DETECTION LOGIC В DTC Malfunction detected condition Possible causes **Display Item** ECM · ABS actuator and electric unit C1130 **ENGINE SIGNAL 1** When a malfunction is detected in ECM system. (control unit) CAN communication line D DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING Е If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test. BRC >> GO TO 2. 2. CHECK DTC DETECTION (D)With CONSULT-III. Turn the ignition switch OFF to ON. 1. Perform self-diagnosis for "ABS". 2. Н Is DTC "C1130" detected? YES >> Proceed to BRC-183, "Diagnosis Procedure". >> INSPECTION END NO **Diagnosis** Procedure INFOID:00000006386146 1.CHECK ENGINE SYSTEM (P)With CONSULT-III. Perform self-diagnosis for "ENGINE". Κ Is any DTC detected? YES >> Check the DTC. NO >> GO TO 2. **2.**CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) L (P)With CONSULT-III. 1. Erase Self-diagnosis result for "ABS". M Turn the ignition switch OFF and wait 10 second or more. 2. 3. Start the engine and drive the vehicle for a short period of time. 4. Stop the vehicle. Ν 5. Check that the malfunction indicator lamp (MIL) turns OFF. After the vehicle stops, perform self-diagnosis for "ABS". 6. Is DTC "C1130" detected? YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233</u>, "Removal and Installation". NO >> Check pin terminals and connection of each harness connector for abnormal conditions. Repair or replace error-detected parts. Ρ

[WITH ESP]

A

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1140 ACTUATOR RELAY SYSTEM

DTC Logic

INFOID:000000006601898

[WITH ESP]

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.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III.

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

Is DTC "C1140" detected?

- YES >> Proceed to <u>BRC-184, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006601899

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> INSPECTION END

${\it 3.}$ check actuator relay power supply

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector	Connector Terminal		voltage
E35	2	Ground	10 – 16 V

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[WITH ESP]

ABS actuator and ele	ectric unit (control unit)			А
Connector	Terminal	—	Voltage	
E35	2	Ground	10 – 16 V	D
Is the inspection re	esult normal?			В
YES >> GO TO				
NO >> GO TO 1				С
	ATOR RELAY POW	ER SUPPLY (
 Turn the ignition Check 50 A future 	on switch OFF. Isible link (I).			D
3. Check continu	ity and short circuit		actuator and electric unit (control unit) harness connector	
terminal (2) ar	nd 50 A fusible link	(I).		Е
•		s for battery po	ower supply. Refer to PG-10, "Wiring Diagram - BATTERY	
POWE	<u>ER SUPPLY -"</u> .			
	r or replace error-d	•		BR
	ATOR RELAY GRO	OUND CIRCUIT		
	on switch OFF.	ctuator and ele	ectric unit (control unit) harness connector and the ground.	G
	ity between ADO a		control unity namess connector and the ground.	
ABS actuator and ele	ectric unit (control unit)			
Connector	Terminal	—	Continuity	Н
E35	3	Ground	Existed	
	4	Clound		I
Is the inspection re				
YES >> GO TO NO >> Repair	O 6. r or replace error-d	etected parts		J
6. CHECK TERMI	•			
Check ABS actuat	or and electric unit	(control unit) p	oin terminals for damage or loose connection with harness	K
connector.		(Γ\
Is the inspection re				
YES >> Replace tion".	ce ABS actuator a	nd electric unit	t (control unit). Refer to <u>BRC-233, "Removal and Installa-</u>	L
	r or replace error-d	etected parts.		
				N
				N
				Ν
				0

Ρ

C1142 PRESS SENSOR

DTC Logic

INFOID:000000006386147

[WITH ESP]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

(B) With CONSULT-III.

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

Is DTC "C1142" detected?

- YES >> Proceed to <u>BRC-186, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006386148

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

Check ABS actuator and electric unit (control unit) power supply system. Refer to <u>BRC-205, "Diagnosis Proce-</u> dure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK BRAKE FLUID LEACKAGE

Check brake fluid leakage.

- LHD: Refer to <u>BR-12, "Inspection"</u>.
- RHD: Refer to <u>BR-80, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 4.

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

4.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" again.

Is DTC"C1142" detected?

YES >> GO TO 5.

>> INSPECTION END

А

В

Н

Ν

Ρ

5.CHECK ESP PRESSURE SENSOR CIRCUIT

1. Turn ignition switch OFF.

NO

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

	- Continuity	ure sensor	ESP pressu	ctric unit (control unit)	ABS actuator and ele	
		Terminal	Connector	Terminal	Connector	
D	Not existed	1		10		
_	Not existed	2	-	10	-	
E	Existed	3	-	10	-	
	Not existed	1		7	-	
_	Existed	2	E113	7	E35	
BF	Not existed	3	-	7	-	
_	Existed	1		32		
G	Not existed	2	-	32	-	
	Not existed	3		32		

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK ESP PRESSURE SENSOR POWER SUPPLY

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Turn the ignition switch ON.

CAUTION:

Never start the engine.

3. Check voltage ESP pressure sensor harness connector terminals.

ESP pres	ESP pressure sensor	
Connector	Terminal	- Voltage
E113	1 – 2	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> <u>tion"</u>.

7.CHECK ESP PRESSURESENSOR (1)

- 1. Turn ignition switch OFF.
- 2. Secure connect ESP pressure sensor harness connector.
- 3. Check loose connection with harness connector.
- 4. Turn ignition switch ON.
- CAUTION: Never start the engine.
- 5. In 1 second or more after ignition switch ON, check pressure sensor voltage.

ESP pressure sensor		Condition	Voltage	
connector	Terminal	Condition	voltage	
E113	1-2	When brake pedal is not depressed.	Approx. 0.5 V	
LIIJ	1-2	When brake pedal is depressed.	0.5 – 4.5 V (Note)	

Voltage changes according to the degree of the application of the brake pedal.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233. "Removal and Installa-</u> tion".
- NO >> Replace ESP pressure sensor.
 - LHD: Refer to <u>BR-24</u>, "FRONT : Exploded View".
 - RHD: Refer to <u>BR-91, "FRONT : Exploded View"</u>.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1143 STEERING ANGLE SENSOR

DTC Logic

DTC DETECTION LOGIC В DTC Malfunction detected condition Possible causes **Display Item** · Harness or connector Steering angle sensor · ABS actuator and electric unit When a malfunction is detected in steering angle sen-ST ANG SEN CIRCUIT C1143 (control unit) sor. D Fuse Ignition power supply system CAN communication line Ε DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING BRC If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test. >> GO TO 2. 2.CHECK DTC DETECTION (R)With CONSULT-III. Н Turn the ignition switch OFF to ON. 1. 2. Perform self-diagnosis for "ABS". Is DTC "C1143" detected? YES >> Proceed to BRC-189, "Diagnosis Procedure". >> INSPECTION END NO Diagnosis Procedure INFOID:00000000638615 1.CHECK STEERING ANGLE SENSOR POWER SUPPLY Κ 1. Turn the ignition switch OFF. 2. Disconnect steering angle sensor harness connector. 3. Check voltage between steering angle sensor harness connector and ground. Steering angle sensor Voltage Connector Terminal Μ M30 4 Ground Approx. 0 V 4.

4. Turn the ignition switch ON. CAUTION:

Never start engine.

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

Steering a	ngle sensor		Voltage	
Connector	Terminal		voltage	
M30	4	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 3.

2.CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.

BRC-189

INFOID:000000006386150

А

Ν

Ρ

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

 Check continuity and short circuit between steering angle sensor harness connector terminal (4) and 10 A fuse (#3).

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-15, "Wiring Diagram - IGNITION</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

3.CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.

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

Steering a	ngle sensor		Continuity	
Connector	Terminal		Continuity	
M30	1	Ground	Existed	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

Check steering angle sensor pin terminals for damage or loose connection with harness connector. Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK CAN COMMUNICATION LINE

Check "STRG BRANCH LINE CIRCUIT". Refer to LAN-51, "Diagnosis Procedure".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233. "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts. Refer to <u>BRC-96. "Precaution for Harness Repair"</u>.

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT [WITH ESP]

< DTC/CIRCUIT DIAGNOSIS >

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Logic

INFOID:000000006386152

DTC	Display Item	Malfunction detected condition	Possible causes
C1144	ST ANG SEN SIGNAL	When neutral position adjustment of steering angle sensor is not complete.	 Harness or connector Steering angle sensor ABS actuator and electric unit (control unit) Incomplete neutral position ad- justment of steering angle sen- sor
	ONFIRMATION PROCE	DURE	
1.PRE	CONDITIONING		
	CONFIRMATION PROCE	DURE" has been previously conducted, always	s turn ignition switch OFF and
wait at i		nducting the next test.	
	>> GO TO 2.		
2. сне	CK DTC DETECTION		
9	CONSULT-III.		
	n the ignition switch OFF to form self-diagnosis for "AB		
	C1144" detected?		
YES NO	>> Proceed to <u>BRC-191,</u> >> INSPECTION END	"Diagnosis Procedure".	
-			
	osis Procedure		INFOID:00000006386153
1. ADJI	JST THE NEUTRAL POSI	TION OF STEERING ANGLE SENSOR	
Perform	neutral position adjustment	nt of steering angle sensor. Refer to <u>BRC-149.</u>	"Work Procedure".
	>> GO TO 2.		
2.сне		ERECTRIC UNIT (CONTROL UNIT)	
	CONSULT-III.		
Dorform	self-diagnosis for "ABS".		
<u>Is DTC '</u>	<u>C1144" detected?</u>		
	>> GO TO 3. >> INSPECTION END		
<u>Is DTC '</u> YES NO	>> GO TO 3. >> INSPECTION END	ENSOR SYSTEM	
IS DTC YES NO 3. CHE 1. Turi	>> GO TO 3. >> INSPECTION END CK STEERING ANGLE SE In the ignition switch OFF.		
<u>Is DTC '</u> YES NO 3. CHE 1. Turi 2. Che	>> GO TO 3. >> INSPECTION END CK STEERING ANGLE SE the ignition switch OFF. eck steering angle sensor s	ENSOR SYSTEM system. Refer to <u>BRC-189, "Diagnosis Procedu</u>	ure".
IS DTC ' YES NO 3. CHE 1. Turi 2. Che Is the in	>> GO TO 3. >> INSPECTION END CK STEERING ANGLE SE the ignition switch OFF. eck steering angle sensor s spection result normal?	system. Refer to <u>BRC-189, "Diagnosis Procedu</u>	
<u>Is DTC '</u> YES NO 3. CHE 1. Turi 2. Che	>> GO TO 3. >> INSPECTION END CK STEERING ANGLE SE the ignition switch OFF. eck steering angle sensor s spection result normal?	system. Refer to <u>BRC-189, "Diagnosis Procedu</u> r and electric unit (control unit). Refer to <u>BRC</u>	

А

C1155 BRAKE FLUID LEVEL SWITCH

DTC Logic

[WITH ESP]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

(B) With CONSULT-III.

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

Is DTC "C1155" detected?

- YES >> Proceed to <u>BRC-192</u>, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK BRAKE FLUID LEVEL

- 1. Turn the ignition switch OFF.
- 2. Check brake fluid level.
- LHD: Refer to <u>BR-12, "Inspection"</u>.
- RHD: Refer to <u>BR-80, "Inspection"</u>.

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Refill brake fluid.
 - LHD: Refer to BR-12, "Refilling".
 - RHD: Refer to <u>BR-80, "Refilling"</u>.

2. PERFORM SELF-DIAGNOSIS (1)

(I) With CONSULT-III.

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

Never start the engine.

- Perform self-diagnosis for "ABS".
- Is DTC "C1155" detected?
- YES >> INSPECTION END
- NO >> GO TO 3.
- 3.CHECK BRAKE FLUID LEVEL SWITCH

Check brake fluids level switch. Refer to <u>BRC-194, "Component Inspection"</u>. <u>Is the inspection result normal?</u>

BRC-192

INFOID:000000006387132

C1155 BRAKE FLUID LEVEL SWITCH

C1155 BRAKE FLUID LEVEL SWITCH	
< DTC/CIRCUIT DIAGNOSIS > [WITH ESP	<u>']</u>
 YES >> GO TO 5. NO >> Replace reservoir tank. GO TO 4. • LHD: Refer to <u>BR-44, "Disassembly and Assembly"</u>. • RHD: Refer to <u>BR-109, "Disassembly and Assembly"</u>. 	A
4.PERFORM SELF-DIAGNOSIS (2)	В
 With CONSULT-III. Erase Self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. Turn the ignition switch ON. CAUTION: Never start the engine. Perform self-diagnosis for "ABS". <u>Is DTC "C1155" detected?</u> YES >> INSPECTION END 	
NO >> GO TO 5.	
5. CHECK CONNECTOR AND TERMINAL	_
 Turn the ignition switch OFF. Disconnect brake fluid level switch harness connector. Check brake fluid level switch harness connector for disconnection or looseness. Check brake fluid level switch pin terminals for damage or loose connection with harness connector. Disconnect combination meter harness connector for disconnection or looseness. Check combination meter harness connector for disconnection or looseness. Check combination meter harness connector for disconnection or looseness. Check combination meter pin terminals for damage or loose connection with harness connector. Is the inspection result normal? YES >> GO TO 7. NO >> Repair or replace error-detected parts. GO TO 6. PERFORM SELF-DIAGNOSIS (3) 	G G
 With CONSULT-III. Connect brake fluid level switch harness connector. Connect combination meter harness connector. Erase Self-diagnosis result for "ABS". Turn the ignition switch OFF, and wait 10 seconds or more. 	J
 Turn the ignition switch ON. CAUTION: Never start the engine. Perform self-diagnosis for "ABS". Is DTC "C1155" detected? 	L
YES >> INSPECTION END NO >> GO TO 7.	N
7.CHECK BRAKE FLUID LEVEL SWITCH HARNESS	_
 Turn the ignition switch OFF. Disconnect brake fluid level switch harness connector. Disconnect combination meter harness connector. Check continuity between brake fluid level switch harness connector and combination meter harness connector. 	N ٦- ر

Brake fluid	Brake fluid level switch		Combination meter	
Connector	Terminal	Connector	Terminal	Continuity
E37 ^{*1} E42 ^{*2}	1	M34	11	Existed

*1: 4WD

```
*2: 2WD
```

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

BRC-193

Ρ

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Brake fluid	level switch		Continuity	
Connector	Terminal		Continuity	
E37 ^{*1} E42 ^{*2}	1	Ground	Not existed	

*1: 4WD *2: 2WD

Is the inspection result normal?

YES >> GO TO 8.

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

8.CHECK BRAKE FLUID LEVEL SWITCH GROUND

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

Brake fluid	level switch		Continuity	
Connector	Terminal		Continuity	
E37 ^{*1} E42 ^{*2}	2	Ground	Existed	

*1: 4WD

*2: 2WD

Is the inspection result normal?

YES >> GO TO 9.

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

9.CHECK COMBINATION METER

Check combination meter. Refer to <u>MWI-23, "CONSULT-III Function"</u>.

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233. "Removal and Installa-</u> tion".
- NO >> Repair or replace combination meter. Refer to <u>MWI-69. "Removal and Installation"</u>.

Component Inspection

INFOID:000000006387133

1. CHECK BRAKE FLUID LEVEL SWITCH

1. Turn the ignition switch OFF.

2. Disconnect brake fluid level switch harness connector.

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

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

Is the inspection result normal?

YES >> INSPECTION END

- NO >> Replace reservoir tank.
 - LHD: Refer to BR-44, "Disassembly and Assembly".
 - RHD: Refer to BR-109, "Disassembly and Assembly".

C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1164, C1165 CV SYSTEM

DTC Logic

[WITH ESP]

INFOID:000000006387188

	Dis	play Item	Malfu	unction detected condition	Possible causes
C1164	CV 1		When a malfund	ction is detected in cut valve 1.	Harness or connector ABS actuator and electric unit
C1165	CV 2		When a malfund	ction is detected in cut valve 2.	(control unit)Fusible linkBattery power supply system
		ION PROCED	URE		
	CONDITION				
"DTC ait at l	CONFIRMAT	FION PROCEDU nds before cond	JRE" has beer	n previously conducted, alwa	ays turn ignition switch OFF and
anati					
	>> GO TO 2				
.CHE	CK DTC DE	TECTION			
	CONSULT-II				
		switch OFF to (gnosis for "ABS			
		C1165" detected			
′ES		l to <u>BRC-195,</u> "E		edure".	
10	>> INSPEC		-		
iagn	osis Proce	edure			INFOID:000000063871
-	osis Proce				INFOID:0000000638718
.CHE	CK CUT VAL	VE POWER SL	JPPLY		INFOID:000000063871
CHE	CK CUT VAL	VE POWER SU		ntrol unit) harness connector	
.CHE Tur Dis	CK CUT VAL n the ignition connect ABS	VE POWER SL switch OFF.	ectric unit (cor	ntrol unit) harness connector ctric unit (control unit) harne	r.
CHE Tur Dise	CK CUT VAL n the ignition connect ABS eck voltage b	VE POWER SL switch OFF. actuator and el etween ABS ac	ectric unit (cor		r.
. CHE . Tur . Disc . Che	CK CUT VAL n the ignition connect ABS eck voltage b	VE POWER SL switch OFF. actuator and el etween ABS ac ic unit (control unit)	ectric unit (cor		r.
CHE Tur Disc Che ABS act	CK CUT VAL n the ignition connect ABS eck voltage b ruator and electr	VE POWER SL switch OFF. actuator and el etween ABS ac ic unit (control unit) Terminal	ectric unit (cor tuator and elec	ctric unit (control unit) harne	r.
CHE Tur Dis Che	CK CUT VAL n the ignition connect ABS eck voltage b tuator and electr nnector E35	VE POWER SL switch OFF. actuator and el etween ABS ac ic unit (control unit) Terminal 2	ectric unit (cor	ctric unit (control unit) harne	r.
. CHE . Tur . Disc . Che ABS act Cor . Tur CA	CK CUT VAL n the ignition connect ABS eck voltage b tuator and electr nnector E35 n the ignition UTION:	VE POWER SL switch OFF. actuator and el etween ABS act ic unit (control unit) Terminal 2 switch ON.	ectric unit (cor tuator and elec	ctric unit (control unit) harne	r.
. CHE . Tur . Dise . Che ABS act Cor . Tur CA Nev	CK CUT VAL n the ignition connect ABS eck voltage b tuator and electr nnector E35 n the ignition UTION: ver start eng	LVE POWER SL switch OFF. actuator and el etween ABS act ic unit (control unit) Terminal 2 switch ON. jine.	ectric unit (cor tuator and elec Ground	Ctric unit (control unit) harne	r. ss connector and ground.
. CHE . Tur . Dise . Che ABS act Cor . Tur CA Nev	CK CUT VAL n the ignition connect ABS eck voltage b tuator and electr nnector E35 n the ignition UTION: ver start eng	LVE POWER SL switch OFF. actuator and el etween ABS act ic unit (control unit) Terminal 2 switch ON. jine.	ectric unit (cor tuator and elec Ground	ctric unit (control unit) harne	r. ss connector and ground.
. CHE . Tur . Disc . Che ABS act Cor Cor Cor . Tur CA Nev . Che	CK CUT VAL n the ignition connect ABS eck voltage b tuator and electr nnector E35 n the ignition UTION: ver start eng eck voltage b	VE POWER SL switch OFF. actuator and el etween ABS ac ic unit (control unit) Terminal 2 switch ON. ine. etween ABS ac	ectric unit (cor tuator and elec Ground	ctric unit (control unit) harne Voltage Battery voltage ctric unit (control unit) harne	r. ss connector and ground.
. CHE . Tur . Dis . Che ABS act Cor . Tur CA Nev . Che	CK CUT VAL n the ignition connect ABS eck voltage b tuator and electr nnector E35 n the ignition UTION: ver start eng eck voltage b	LVE POWER SL switch OFF. actuator and el etween ABS act ic unit (control unit) Terminal 2 switch ON. jine.	ectric unit (cor tuator and elec Ground	Ctric unit (control unit) harne	r. ss connector and ground.
. CHE . Tur . Disa . Che ABS act Cor . Tur CA Nev . Che	CK CUT VAL n the ignition connect ABS eck voltage b ruator and electr nnector E35 n the ignition UTION: ver start eng eck voltage b	VE POWER SL switch OFF. actuator and el etween ABS ac ic unit (control unit) Terminal 2 switch ON. jine. etween ABS ac	ectric unit (cor tuator and elec Ground	ctric unit (control unit) harne Voltage Battery voltage ctric unit (control unit) harne	r. ss connector and ground.
CHE Turi Diss Che ABS act Cor ABS act ABS act	CK CUT VAL n the ignition connect ABS eck voltage b tuator and electr nnector E35 n the ignition UTION: ver start eng eck voltage b tuator and electri nnector E35	VE POWER SL switch OFF. actuator and el etween ABS ac ic unit (control unit) Terminal 2 switch ON. jine. etween ABS ac ic unit (control unit) Terminal 2	ectric unit (cor tuator and elec Ground tuator and elec	ctric unit (control unit) harne Voltage Battery voltage ctric unit (control unit) harne Voltage	r. ss connector and ground.
CHE Tur Diss Che BS act Cor Tur CA Nev Che	CK CUT VAL n the ignition connect ABS eck voltage b tuator and electr nnector E35 n the ignition UTION: ver start eng eck voltage b	VE POWER SL switch OFF. actuator and el etween ABS ac ic unit (control unit) Terminal 2 switch ON. ine. etween ABS ac ic unit (control unit) Terminal 2 ult normal?	ectric unit (cor tuator and elec Ground tuator and elec	ctric unit (control unit) harne Voltage Battery voltage ctric unit (control unit) harne Voltage	r. ss connector and ground.

Turn the ignition switch OFF.
 Check 50 A fusible link (I).

А

C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

3. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 50 A fusible link (I).

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-10, "Wiring Diagram - BATTERY</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

3.CHECK CUT VALVE GROUND CIRCUIT

1. Turn the ignition switch OFF.

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

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E35	3	Ground	Existed
L33	4	Ground	LAISted

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

C1166, C1167 SV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

DTC DETECTION LOGIC

C1166, C1167 SV SYSTEM

DTC Logic

[WITH ESP]

А

INFOID:000000006387190

DTC	Display Item	Malfu	unction detected condition	Possible causes
C1166	SV 1	When a malfunc	When a malfunction is detected in suction valve 1. • Harness or connector	
C1167	SV 2	When a malfunc	tion is detected in suction valve 2.	 ABS actuator and electric unit (control unit) Fusible link Battery power supply system
DTC CO	ONFIRMATION PROCE	DURE		
1. PRE(CONDITIONING			
f "DTC [,]	CONFIRMATION PROCE	DURE" has been	previously conducted, alway	s turn ignition switch OFF and
	east 10 seconds before co			J
	>> GO TO 2. CK DTC DETECTION			
	CONSULT-III. n the ignition switch OFF t	o ON		
	form self-diagnosis for "AE			
<u>s DTC '</u>	"C1166" or "C1167" detect	ed?		
YES	>> Proceed to <u>BRC-197</u> ,	"Diagnosis Proc	<u>edure"</u> .	
NO	>> INSPECTION END			
Diagno	osis Procedure			INFOID:00000006387191
1 .CHE	CK CUT VALVE POWER	SUPPLY		
	CK CUT VALVE POWER	SUPPLY		
1. Turr 2. Disc	n the ignition switch OFF. connect ABS actuator and	electric unit (cor	ntrol unit) harness connector.	
1. Turr 2. Disc	n the ignition switch OFF. connect ABS actuator and	electric unit (cor	ntrol unit) harness connector. ctric unit (control unit) harness	s connector and ground.
1. Turr 2. Disc 3. Che	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS	electric unit (cor actuator and elec		s connector and ground.
1. Turr 2. Disc 3. Che ABS actu	n the ignition switch OFF. connect ABS actuator and	electric unit (cor actuator and elec		s connector and ground.
1. Turr 2. Disc 3. Che ABS actu Cor	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur	electric unit (cor actuator and elec	ctric unit (control unit) harness	s connector and ground.
1. Turr 2. Disc 3. Che ABS actu Cor	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur nnector Terminal	electric unit (cor actuator and elec	Voltage	s connector and ground.
1. Turr 2. Disc 3. Che ABS actu Cor I 4. Turr CAU	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur nnector Terminal E35 2 n the ignition switch ON. UTION:	electric unit (cor actuator and elec	Voltage	s connector and ground.
1. Turr 2. Disc 3. Che ABS actu Cor 4. Turr CAU Nev	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur nnector Terminal E35 2 n the ignition switch ON. UTION: /er start engine.	electric unit (cor actuator and elec it)	Voltage Battery voltage	
1. Turr 2. Disc 3. Che ABS actu Cor 4. Turr CAU Nev	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur nnector Terminal E35 2 n the ignition switch ON. UTION: /er start engine.	electric unit (cor actuator and elec it)	Voltage	
1. Turr 2. Disc 3. Che ABS actu Cor 4. Turr CAU Nev 5. Che	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur nnector Terminal E35 2 n the ignition switch ON. UTION: /er start engine.	electric unit (cor actuator and elec it)	Voltage Battery voltage Ctric unit (control unit) harness	
1. Turr 2. Disc 3. Che ABS actu Cor I 4. Turr CAU Nev 5. Che	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur nnector Terminal E35 2 n the ignition switch ON. UTION: ver start engine. eck voltage between ABS	electric unit (cor actuator and elec it)	Voltage Battery voltage	
1. Turr 2. Disc 3. Che ABS actu Cor 4. Turr CAU Nev 5. Che ABS actu Cor	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur nnector Terminal E35 2 n the ignition switch ON. UTION: /er start engine. eck voltage between ABS	electric unit (cor actuator and elec it)	Voltage Battery voltage Ctric unit (control unit) harness	
1. Turr 2. Disc 3. Che ABS actu Cor 4. Turr CAU Nev 5. Che ABS actu Cor	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur nnector Terminal E35 2 n the ignition switch ON. UTION: /er start engine. eck voltage between ABS uator and electric unit (control un nnector Terminal	electric unit (cor actuator and elec it)	Voltage Battery voltage Ctric unit (control unit) harness Voltage	
1. Turr 2. Disc 3. Che ABS actu Cor 4. Turr CAU 5. Che ABS actu Cor E Is the in: YES	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur nnector Terminal E35 2 n the ignition switch ON. UTION: /er start engine. eck voltage between ABS uator and electric unit (control un nnector Terminal E35 2 spection result normal? >> GO TO 3.	electric unit (cor actuator and elec it)	Voltage Battery voltage Ctric unit (control unit) harness Voltage	
1. Turr 2. Disc 3. Che ABS actu Cor 4. Turr CAU Nev 5. Che ABS actu Cor E <u>ABS actu</u> Cor E <u>Is the in</u>	n the ignition switch OFF. connect ABS actuator and eck voltage between ABS uator and electric unit (control ur nnector Terminal E35 2 n the ignition switch ON. UTION: ver start engine. eck voltage between ABS uator and electric unit (control un nnector Terminal E35 2 spection result normal?	electric unit (cor actuator and elec it)	Ctric unit (control unit) harness Voltage Battery voltage Voltage Voltage Battery voltage Battery voltage	

Turn the ignition switch OF
 Check 50 A fusible link (I).

В

C1166, C1167 SV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

3. Check continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 50 A fusible link (I).

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-10, "Wiring Diagram - BATTERY</u> <u>POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

3.CHECK CUT VALVE GROUND CIRCUIT

1. Turn the ignition switch OFF.

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

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal		Continuity	
E35	3	Ground	Existed	
E33	4	Ground	Existed	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

C1176 STOP LAMP SW2

DTC Logic

[WITH ESP]

INFOID:000000006387347

А

В

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	0		
C1176	STOP LAMP SW2	When brake switch/brake pedal position switch signal is not input when brake pedal operates.	 Harness or connector Brake switch/brake pedal position switch ABS actuator and electric unit (control unit) Ignition power supply system 	C		
DTC CC	NFIRMATION PROC	EDURE		Е		
1.PREC	ONDITIONING					
		EDURE" has been previously conducted, always t conducting the next test.	urn ignition switch OFF and	BRC		
-	>> GO TO 2. K DTC DETECTION			G		
1. Turn	CONSULT-III. the ignition switch OFF orm self-diagnosis for "A			Н		
YES	<u>C1176" detected?</u> >> Proceed to <u>BRC-199</u> >> INSPECTION END), "Diagnosis Procedure".		l		
Diagnosis Procedure						
for 1 min		when the brake pedal and the accelerator pedal are g the vehicle. This is not a malfunction. STOMER	e simultaneously depressed	K		
driving th	the brake pedal and the le vehicle. such a history?	e accelerator pedal are simultaneously depressed	I for 1 minute or more while	L		
NO	>> GO TO 2. >> GO TO 3. 'ORM SELF-DIAGNOSI	S		Μ		
With C	CONSULT-III. e Self-diagnosis result f			Ν		
3. Start CAL	the engine. TION: er start the vehicle.	, and wait to seconds of more.		0		
4. Dep 5. Perf	ress the brake pedal sev form self-diagnosis for "A C1176" detected?			Ρ		
YES NO	>> GO TO 3. >> INSPECTION END					
3.CHEC	K BRAKE SWITCH/BR	AKE PEDAL POSITION SWITCH CLEARANCE				

- 1.
- Turn the ignition switch OFF. Check brake switch/brake pedal position switch clearance. 2.

< DTC/CIRCUIT DIAGNOSIS >

- LHD: Refer to <u>BR-9</u>, "Inspection and Adjustment".
- RHD: Refer to <u>BR-77, "Inspection and Adjustment"</u>.

Is the inspection result normal?

- YES >> GO TO 5. NO >> Adjust bi
 - >> Adjust brake switch/brake pedal position switch clearance. GO TO 4.
 - LHD: Refer to <u>BR-77, "Inspection and Adjustment".</u>
 - RHD: Refer to <u>BR-77, "Inspection and Adjustment"</u>.

4.CHECK DATA MONITOR (1)

With CONSULT-III.

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

Never start the vehicle.

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-136, "Reference Value"</u>.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5.CHECK BRAKE SWITCH/BRAKE PEDAL POSITION SWITCH

Check brake switch/brake pedal position switch. Refer to BRC-177, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO

- >> Replace brake switch/brake pedal position switch. GO TO 6.
 - LHD: Refer to <u>BR-21, "Removal and Installation"</u>.
 - RHD: Refer to BR-89, "Removal and Installation".

6.CHECK DATA MONITOR (2)

With CONSULT-III.

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

Never start the vehicle.

4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-136. "Reference Value"</u>.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 7.

7. CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

YES >> GO TO 9.

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

8.CHECK DATA MONITOR (3)

	DIAGNOSIS >		-	[WITH ESP]
Connect brake Erase Self-dia Turn the ignitic Start the engin	e switch/brake peda gnosis result for "Al on switch OFF, and	I position switch BS".	it) harness connector. harness connector. or more.	
	"DATA MONITOR" a or "Off" when brake		P SW2" according to this ordes s or release. Refer to <u>BRC-13</u>	
YES >> INSPE NO >> GO TO	CTION END 0 11.			
. Turn the ignitic . Disconnect AB	on switch OFF. 3S actuator and ele	ctric unit (control	ON SWITCHCIRCUIT (1) unit) harness connector. unit (control unit) harness co	nnector and ground.
	ctric unit (control unit)	_	Condition	Voltage
Connector	Terminal		Brake pedal depressed	Battery voltage
E35	6	Ground	Brake pedal not depressed	Approx. 0 V
ABS actuator and elec Connector	ctric unit (control unit) Terminal	_	Condition	Voltage
E35	6	Ground	Brake pedal depressed Brake pedal not depressed	Approx. 0 V
NO >> Repair 0.CHECK BRAN Turn the ignitic Disconnect bra Check continu	ce ABS actuator ar or replace error-de KE SWITCH/BRAK on switch OFF. ake switch/brake pe ity between ABS	etected parts. GC E PEDAL POSIT edal position swit actuator and ele	TION SWITCH CIRCUIT (2) ch harness connector. ectric unit (control unit) harr	
	edal position switch			
Connector	Terminal	Connect	· · ·	Continuity
E35	6	E111 ^{*1} E112 ^{*2} M202 ^{*3} M204 ^{*4}	2	Existed
E35 *1: Brake switc *2: Brake peda *3: Brake switc *4: Brake peda	6 ch (LHD models an al position switch (L ch (RHD models wi al position switch (R	Connect E111 ^{*1} E112 ^{*2} M202 ^{*3} M204 ^{*4} d RHD models w HD models and th M/T) thD models with	2 with CVT) RHD models with CVT)	Existed

< DTC/CIRCUIT DIAGNOSIS >

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Connector Terminal		Continuity	
E35	6	Ground	Not existed	

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233. "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts. GO TO 11.

11.CHECK DATA MONITOR (4)

()With CONSULT-III.

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect brake switch/brake pedal position switch harness connector.
- 3. Erase Self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF, and wait 10 seconds or more.
- 5. Start the engine.

CAUTION:

Never start the vehicle.

6. Select "ABS", "DATA MONITOR" and "STOP LAMP SW2" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depress or release. Refer to <u>BRC-136, "Reference Value"</u>.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> tion".

Component Inspection

INFOID:000000006387349

1. CHECK BRAKE SWITCH/BRAKE PEDAL POSITION SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect brake switch/brake pedal position switch harness connector.
- 3. Check continuity between brake switch/brake pedal position switch harness connector terminals.

brake switch/brake pedal position switch	Condition	Continuity	
Terminal	Condition		
1 – 2	Brake pedal is fully released.	Not existed	
1 – 2	Brake pedal is slightly depressed.	Existed	

Is the inspection result normal?

YES >> INSPECTION END

NO

- >> Replace brake switch/brake pedal position switch.
 - LHD: Refer to BR-21, "Removal and Installation".
 - RHD: Refer to BR-89, "Removal and Installation".

U1000 CAN COMM CIRCUIT

Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:000000006601901

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U1000	CAN COMM CIRCUIT	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.	CAN communication system mal- function
тс со	ONFIRMATION PROCED	URE	
1.PREG	CONDITIONING		
f "DTC (CONFIRMATION PROCED	URE" has been previously conducted, always	turn ignition switch OFF and
	east 10 seconds before con		5
	>> GO TO 2.		
2.CHE	CK DTC DETECTION		
	CONSULT-III		
1. Turr	n the ignition switch OFF to		
	orm self-diagnosis for "ABS <u>'U1000" detected?</u>	·	
YES	>> Proceed to <u>BRC-203, "I</u>	Diagnosis Procedure".	
NO	>> INSPECTION END		
Diagno	osis Procedure		INFOID:00000006601902
Proceed	to LAN-17, "Trouble Diagno	osis Flow Chart".	

Ρ

[WITH ESP]

INFOID:000000006601900

Α

U1010 CONTROL UNIT (CAN)

Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:000000006601904

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible causes
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.PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Turn the ignition switch OFF to ON.

2. Perform self-diagnosis for "ABS".

Is DTC "U1010" detected?

YES >> Proceed to <u>BRC-204</u>, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006601905

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

Check ABS actuator and electric unit (control unit) harness connector for disconnection and deformation. Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233. "Removal and Installa-</u> tion".
- NO >> Repair or replace error-detected parts.

INFOID:000000006601903

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

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

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Connector Terminal		voltage	
E35	16	Ground	Approx. 0 V	

4. Turn the ignition switch ON CAUTION:

Never start engine.

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

ABS actuator and ele	ctric unit (control unit)		Voltage
Connector	Terminal		voltage
E35	16	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

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

- 1. Turn the ignition switch OFF.
- 2. Check 10 A fuse (#57).
- 3. Disconnect IPDM E/R harness connector.
- Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R ^J harness connector.

ABS actuator an	ABS actuator and electric unit (control unit)		IPDM E/R	
Connector	Terminal	Connector	Terminal	Continuity
E35	16	E15	59	Existed

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

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E35	16	Ground	Not existed

Is the inspection result normal?

- YES >> Perform trouble diagnosis for ignition power supply. Refer to <u>PG-15, "Wiring Diagram IGNITION</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

$\mathbf{3.}$ Check motor and motor relay power supply

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

ABS actuator and ele	ectric unit (control unit)		Voltage
Connector Terminal			voltage
E35	1	Ground	10 – 16 V

BRC-205

INFOID:000000006601906

Ε

BRC

D

А

В

Н

Κ

L

Μ

Ν

Ρ

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector Terminal			voltage	
E35	1	Ground	10 – 16 V	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-10, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

 $\mathbf{5.}$ CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY

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

ABS actuator and electric unit (control unit)			Voltage	
Connector	Connector Terminal		voltage	
E35	2	Ground	10 – 16 V	

3. Turn the ignition switch ON CAUTION:

Never start engine.

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal	_	voltage	
E35	2	Ground	10 – 16 V	

Is the inspection result normal?

YES >> GO TO 7.

```
NO >> GO TO 6.
```

 ${f 6.}$ CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY CIRCUIT

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

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply. Refer to <u>PG-10, "Wiring Diagram BATTERY</u> <u>POWER SUPPLY -"</u>.
- NO >> Repair or replace error-detected parts.

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

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITH ESP]

ABS actuator and electric unit (control unit)			Continuity	
Connector	Terminal		Continuity	
E35	3	Ground	Existed	
200	4	Globalia	Existed	

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8.CHECK TERMINAL

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

• Check IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >:	> INSPECTION END

NO >> Repair or replace error-detected parts.

BRC

А

В

С

D

Е

Н

J

Κ

L

Μ

Ν

Ο

Ρ

G

PARKING BRAKE SWITCH

Component Function Check

1.CHECK PARKING BRAKE SWITCH OPERATION

Operate the parking brake lever. Then check that the brake warning lamp in the combination meter turns ON/ OFF correctly.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to <u>BRC-208</u>, "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK PARKING BRAKE SWITCH CIRCUIT

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

Parking b	Parking brake switch Combination meter		Combination meter		
Connector	Terminal	Connector Terminal		Continuity	
M31	1	M34	10	Existed	

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

Parking brake switch			Continuity	
Connector	Terminal		Continuity	
M31	1	Ground	Not existed	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK PARKING BRAKE SWITCH

Check the parking brake switch. Refer to BRC-208. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace parking brake switch. Refer to <u>PB-5, "Removal and Installation"</u>.

3.CHECK COMBINATION METER

Check combination meter. Refer to <u>MWI-23, "CONSULT-III Function"</u>.

Is the inspection result normal?

- YES >> Check each pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.
- NO >> Repair or replace combination meter. Refer to MWI-69, "Removal and Installation".

Component Inspection

1. CHECK PARKING BRAKE SWITCH

1. Turn the ignition switch OFF.

2. Disconnect parking brake switch harness connector.

3. Check continuity between parking brake switch harness connector.

INFOID:000000006601910

INFOID:000000006601911

INFOID:000000006601912

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH ESP]

Parking brake switch		Condition	Continuity	A
Terminal	—	When the parking brake switch is operated.	Existed	
1	Ground	When the parking brake switch is not operated.	Not existed	_
Is the inspection res		When the parking brake emissive net operates.	Horoxidad	В
	TION END			
NO >> Replace	e parking brake s	witch. Refer to PB-5. "Removal and Installa	<u>ition"</u> .	С
				0
				D
				E
				L
				BRC
				G
				9
				Н
				I
				J
				K
				L
				5.4
				M
				Ν
				0

Ρ

ESP OFF SWITCH

Component Function Check

INFOID:000000006387351

[WITH ESP]

1.CHECK ESP OFF SWITCH OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-210, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000006387352

1.CHECK ESP OFF SWITCH CIRCUIT

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

ABS actuator and electric unit (control unit)		ESP OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E35	5	M28	1	Existed

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

ABS actuator and electric unit (con- trol unit)		_	Continuity
Connector	Terminal		
E35	5	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ESP OFF SWITCH GROUND CIRCUIT

Check continuity between ESP OFF switch harness connector and ground.

ESP OFF switch			Continuity
Connector	Connector Terminal		Continuity
M28	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK ESP OFF SWITCH

Check ESP OFF switch. Refer to BRC-211, "Component Inspection".

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Replace ESP OFF switch. Refer to <u>BRC-237</u>, "Removal and Installation".

4.CHECK ESP OFF SWITCH SIGNAL

(B) With CONSULT-III.

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

ESP OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[WITH ESP]

				А
Condition		DATA MONITOR		A
When ESP OFF switch is pressed and lamp in combination meter is in ON s		On		
When ESP OFF switch is pressed and lamp in combination meter is in OFF		Off		В
Is the inspection result normal?				С
YES >> INSPECTION END NO >> GO TO 5.)			0
5. CHECK TERMINAL				D
Check ABS actuator and electron	ctric unit (control	unit) pin terminals for damage	e or loose connection with har-	D
ness connector.Check ESP OFF switch pin te	erminals for damage	ge or loose connection with ha	arness connector.	Е
Is the inspection result normal?		-		
YES >> Replace ABS actuation".	ator and electric u	unit (control unit). Refer to BR	C-233, "Removal and Installa-	
NO >> Repair or replace e	error-detected part	S.		BR
Component Inspection			INFOID:00000006387353	
1.CHECK ESP OFF SWITCH				G
1. Turn the ignition switch OF	F			
2. Disconnect triple switch ha	rness connector.			Н
3. Check continuity between t	erminals of ESP (OFF switch connector.		
ESP OFF switch		Condition	Continuity	Ι
Terminal		Condition	Continuity	
1-2	When ESP OFF s	witch is pressed	Existed	J
	When ESP OFF s	witch is not pressed	Not existed	J
Is the inspection result normal?				
YES >> INSPECTION END NO >> Replace ESP OFF		RC-237, "Removal and Instal	lation".	Κ
				L
				в. /
				Μ
				Ν
				0

Ρ

ABS WARNING LAMP

Component Function Check

1.CHECK ABS WARNING LAMP FUNCTION

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

CAUTION:

Never start engine.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to <u>BRC-212</u>, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000006601917

1 .check abs actuator and electric unit (control unit) power supply and ground circuit

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-205</u>, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. PERFORM SELF-DIAGNOSIS

(B) With CONSULT-III.

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-142, "DTC Index"</u>.

NO >> GO TO 3.

 ${f 3.}$ CHECK ABS WARNING LAMP SIGNAL

BWith CONSULT-III.

- 1. Select "ABS", "DATA MONITOR" and "ABS WARN LAMP" according to this order.
- 2. Turn the ignition switch OFF.
- 3. Check that data monitor displays "On" for approx. 1 second after ignition switch is turned ON and then changes to "Off".

CAUTION:

Never start engine.

Is the inspection result normal?

- YES >> Check combination meter. Refer to <u>MWI-23, "CONSULT-III Function"</u>.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>MWI-69. "Removal and Installa-</u> tion".

INFOID:000000006601916

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >	[WITH ESP]
BRAKE WARNING LAMP	
Component Function Check	A INFOID:000000006601918
1. CHECK BRAKE WARNING LAMP FUNCTION (1)	В
Check that brake warning lamp in combination meter turns ON for approx. 1 second after ign turned ON. CAUTION: Never start engine.	nition switch is C
Is the inspection result normal?	
YES >> GO TO 2. NO >> Proceed to <u>BRC-208, "Diagnosis Procedure"</u> .	D
2.CHECK BRAKE WARNING LAMP FUNCTION (2)	F
Check that brake warning lamp in combination meter turns ON/OFF when parking brake is open NOTE:	rated.
Brake warning lamp turns ON when parking brake is operated (when parking brake switch is OI	N). BRO
<u>Is the inspection result normal?</u> YES >> GO TO 3.	
NO >> Check parking brake switch system. Refer to <u>BRC-208, "Diagnosis Procedure"</u> .	
3. CHECK BRAKE WARNING LAMP FUNCTION (3)	G
Check that brake warning lamp in combination meter turns ON/OFF when brake fluid level swit while brake fluid level in reservoir tank is with the specified level. NOTE:	tch is operated ⊣
Brake warning lamp turns ON when brake fluid is less than the specified level (when brake fluid ON).	level switch is
Is the inspection result normal?	
YES >> INSPECTION END NO >> Check brake fluid level switch system. Refer to <u>BRC-208, "Diagnosis Procedure"</u> .	
Diagnosis Procedure	J
1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND CUIT	GROUND CIR- K
Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and Refer to <u>BRC-205</u> , " <u>Diagnosis Procedure</u> ". Is the inspection result normal?	ground circuit.
YES >> GO TO 2. NO >> Repair or replace error-detected parts.	Μ
NO >> Repair or replace error-detected parts. 2.PERFORM THE SELF-DIAGNOSIS	IVI
With CONSULT-III. Perform self-diagnosis for "ABS".	Ν
Is any DTC detected?	
YES >> Check the DTC. Refer to <u>BRC-142, "DTC Index"</u> . NO >> GO TO 3.	0
3. CHECK COMBINATION METER	
Check combination meter. Refer to <u>MWI-23. "CONSULT-III Function"</u> .	P
Is the inspection result normal?	al and loot-li-
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233</u> , "Remova tion".	<u>ai ang installa-</u>

NO >> Repair or replace combination meter. Refer to <u>MWI-69</u>, "Removal and Installation".

ESP WARNING LAMP

Component Function Check

1.CHECK ESP WARNING LAMP FUNCTION

Check that ESP warning lamp in combination meter turns ON for approx. 1 second after ignition switch is turned ON.

CAUTION:

Never start engine.

Is the inspection result normal?

YES >> INSPECTION END

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

Diagnosis Procedure

INFOID:000000006387355

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

Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-205</u>, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.PERFORM THE SELF-DIAGNOSIS

(P)With CONSULT-III.

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-142, "DTC Index"</u>.

NO >> GO TO 3.

3.CHECK ESP WARNING LAMP SIGNAL

With CONSULT-III.

- I. Select "ABS", "DATA MONITOR" and "SLIP/VDC LAMP" according to this order.
- 2. Turn the ignition switch OFF.
- 3. Check that data monitor displays "On" for approx. 1 second after ignition switch is turned ON, and then changes to "Off".

CAUTION:

Never start engine.

Is the inspection result normal?

- YES >> Check combination meter. Refer to <u>MWI-23, "CONSULT-III Function"</u>.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Removal and Installa-</u> tion".

INFOID:00000006387354

ESP OFF INDICATOR LAMP

ESP OFF INDICATOR LAWF	
< DTC/CIRCUIT DIAGNOSIS >	[WITH ESP]
ESP OFF INDICATOR LAMP	
Component Function Check	INFOID:000000006387356
1. CHECK ESP OFF INDICATOR LAMP FUNCTION (1)	
Check that ESP OFF indicator lamp in combination meter turns ON for approx. 1 second aft turned ON. CAUTION: Never start engine.	er ignition switch is
Is the inspection result normal?	
YES >> GO TO 2. NO >> Proceed to diagnosis procedure. Refer to <u>BRC-215, "Diagnosis Procedure"</u> .	
2. CHECK ESP INDICATOR LAMP FUNCTION (2)	
Check that ESP OFF indicator lamp in combination meter turns ON/OFF when ESP OFF s Is the inspection result normal? YES >> INSPECTION END NO >> Check ESP OFF switch system. Refer to <u>BRC-210, "Diagnosis Procedure"</u> .	witch is operated.
Diagnosis Procedure	INFOID:000000006387357
1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY A	
CUIT Perform the trouble diagnosis for ABS actuator and electric unit (control unit) power supply Refer to <u>BRC-205, "Diagnosis Procedure"</u> .	and ground circuit.
<u>Is the inspection result normal?</u> YES >> GO TO 2. NO >> Repair or replace error-detected parts.	
2. CHECK ESP OFF INDICATOR LAMP SIGNAL (1)	
 With CONSULT-III. Select "ABS", "DATA MONITOR" and "OFF LAMP" according to this order. Turn the ignition switch OFF. 	
 Check that data monitor displays "On" for approx. 1 second after ignition switch is tu changes to "Off". CAUTION: 	rned ON, and then
Never start engine.	
Is the inspection result normal?	
 YES >> GO TO 3. NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233, "Replace tion"</u>. 	moval and Installa-
3. CHECK ESP OFF INDICATOR LAMP SIGNAL (2)	
With CONSULT-III. 1. Select "ABS", "DATA MONITOR" and "OFF LAMP" according to this order.	
2. Check that data monitor displays "On" or "Off" each time when ESP OFF switch is ope	rated.
<u>Is the inspection result normal?</u> YES >> Check combination meter. Refer to <u>MWI-23, "CONSULT-III Function"</u> . NO >> Check ESP OFF switch system. Refer to <u>BRC-210, "Diagnosis Procedure"</u> .	

SYMPTOM DIAGNOSIS EXCESSIVE OPERATION FREQUENCY

Description

ESP function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function operates in excessive operation frequency.

Diagnosis Procedure

1.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2. CHECK FRONT AND REAR AXLE

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

Front axle

- MR16DDT: Refer to FAX-9, "Inspection".

- HR16DE: Refer to FAX-41, "Inspection".
- K9K: Refer to FAX-66, "Inspection".
- Rear axle
- 2WD: Refer to <u>RAX-4, "Inspection"</u>.
- 4WD: Refer to RAX-12, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK WHEEL SENSOR

Check wheel sensor.

- Check installation and damage of wheel sensor.
- · Check connection of wheel sensor harness connector.
- Check terminal of wheel sensor harness connector.

Is the inspection result normal?

YES >> GO TO 4.

- >> Repair or replace wheel sensor.
 - Front wheel sensor: Refer to BRC-224, "FRONT WHEEL SENSOR : Removal and Installation".
 - Rear wheel sensor: Refer to <u>BRC-227, "REAR WHEEL SENSOR : Removal and Installation"</u>.

4.CHECK SENSOR ROTOR

Check that there is no looseness, damage or foreign material on sensor rotor.

Is the inspection result normal?

YES >> GO TO 5.

- NO >> Repair installation or replace sensor rotor.
 - Front sensor rotor: Refer to <u>BRC-229</u>, "FRONT SENSOR ROTOR : Removal and Installation".
 - Rear sensor rotor. Refer to BRC-227, "REAR WHEEL SENSOR : Removal and Installation".

5.CHECK WARNING LAMP TURNS OFF

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

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

Is the inspection result normal?

- YES >> Normal
- NO >> Perform self-diagnosis for "ABS" with CONSULT-III.

INFOID:000000006601921

INFOID:000000006601920

UNEXPECTED BRAKE PEDAL REACTION

[WITH ESP] < SYMPTOM DIAGNOSIS > UNEXPECTED BRAKE PEDAL REACTION А Description INFOID:00000006601922 A malfunction of brake pedal feel (height or others) is detected when brake pedal is depressed. В Diagnosis Procedure INFOID:000000006601923 1. CHECK FRONT AND REAR AXLE Check that there is no excessive looseness in front and rear axle. Front axle D - MR16DDT: Refer to FAX-9, "Inspection". - HR16DE: Refer to FAX-41, "Inspection". - K9K: Refer to FAX-66, "Inspection". Rear axle Е - 2WD: Refer to RAX-4, "Inspection". 4WD: Refer to <u>RAX-12</u>, "Inspection". Is the inspection result normal? BRC YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK DISC ROTOR Check disc rotor runout. Front LHD: Refer to <u>BR-16</u>, "DISC ROTOR : Inspection and Adjustment". Н - RHD: Refer to BR-84, "DISC ROTOR : Inspection and Adjustment". Rear LHD: Refer to <u>BR-18</u>, "DISC ROTOR : Inspection and Adjustment". - RHD: Refer to BR-86, "DISC ROTOR : Inspection and Adjustment". Is the inspection result normal? YES >> GO TO 3. NO >> Refinish disc rotor. Front - LHD: Refer to BR-16, "DISC ROTOR : Inspection and Adjustment". - RHD: Refer to BR-84, "DISC ROTOR : Inspection and Adjustment". Κ Rear - LHD: Refer to BR-18, "DISC ROTOR : Inspection and Adjustment". RHD: Refer to BR-86, "DISC ROTOR : Inspection and Adjustment". 3.CHECK BRAKE FLUID LEACKAGE Check fluid leakage. Front M - LHD: Refer to BR-30, "FRONT : Inspection". - RHD: Refer to BR-97, "FRONT : Inspection". Rear Ν - LHD: Refer to <u>BR-39, "REAR : Inspection"</u>. - RHD: Refer to BR-105, "REAR : Inspection". Is the inspection result normal? YES >> GO TO 4. NO >> Repair or replace error-detected parts. **4.**CHECK BRAKE PEDAL Ρ Check each item of brake pedal. LHD: Refer to BR-9, "Inspection and Adjustment". RHD: Refer to BR-77, "Inspection and Adjustment". Is the inspection result normal? YES

- YES >> GO TO 5. NO >> Adjust each i
 - >> Adjust each item of brake pedal.
 - LHD: Refer to <u>BR-9, "Inspection and Adjustment"</u>.

UNEXPECTED BRAKE PEDAL REACTION

< SYMPTOM DIAGNOSIS >

[WITH ESP]

• RHD: Refer to <u>BR-77</u>, "Inspection and Adjustment".

5. CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check each components of brake system.

6.CHECK BRAKE PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector so that ABS does not operate. Check that brake force is normal in this condition. Connect harness connectors after checking.

Is the inspection result normal?

YES >> Normal

NO >> Check each components of brake system.

THE BRAKING DISTANCE IS LONG

THE BRAKING DISTANCE IS LONG	
< SYMPTOM DIAGNOSIS >	[WITH ESP]
THE BRAKING DISTANCE IS LONG	
Description	INFOID:00000006601924
Brake stopping distance is long when ABS function is operated.	
Diagnosis Procedure	INFOID:000000006601925
CAUTION:	
Brake stopping distance on slippery road like rough road, gravel road or snov longer when ABS is operated than when ABS is not operated. 1.CHECK BRAKING FORCE	vy road may become
Check brake force using a brake tester.	
is the inspection result normal?	
YES >> GO TO 2.	
NO >> Check each components of brake system.	
2.CHECK BRAKE PERFORMANCE Disconnect ABS actuator and electric unit (control unit) connector so that ABS does no	t oporato. Chack brake
stopping distance in this condition. Connect harness connectors after checking.	i operate. Oneck brake
s the inspection result normal?	
YES >> Normal NO >> Check each components of brake system.	

< SYMPTOM DIAGNOSIS >

DOES NOT OPERATE

Description

ESP function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function does not operate.

Diagnosis Procedure

INFOID:000000006601927

CAUTION:

- ESP function, TCS function, ABS function, EBD function and brake limited slip differential (BLSD) function never operate when the vehicle speed is 10 km/h (6.2 MPH) or less.
- ESP function and TCS function never operate when ESP OFF switch is operated (when ESP OFF indicator lamp turns ON).

1.CHECK WARNING LAMP

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

CAUTION:

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

Is the inspection result normal?

- YES >> Normal
- NO >> Perform self-diagnosis for "ABS" with CONSULT-III.

INFOID:000000006601926

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS M DIAGNOSIS > [WITH ESP]

< SYMPTOM DIAGNOSIS > RRAKE PEDAL VIRRATION OR OPERATION SOLIND OCCURS

BRAKE	PEDAL VIBRATION OR OPERATION SOUND OCCURS	A
Descript	INFOID:000000006601928	F
engine s	edal vibrates during braking.	E
Vibration condition • When sl • When d	may be felt during brake pedal is lightly depressed (just placing a foot on it) in the following is. This is normal. hifting gears riving on slippery road cornering at high speed	
• When pa	assing over bumps or grooves [Approx. 50 mm (1.97 in) or more] Julling away just after starting engine [at approx. 10 km/h (6.2 MPH) or higher]	
-		E
	TOM CHECK 1	BF
	t there are pedal vibrations when the engine is started.	
	ons occur?	
-	>> GO TO 2.	(
NO >	 Check brake pedal. LHD: Refer to <u>BR-22, "Inspection and Adjustment"</u>. 	
	 RHD: Refer to <u>BR-90</u>, "Inspection and Adjustment". 	F
2.SYMPT	TOM CHECK 2	
Check that	t motor noise from ABS actuator and electric unit (control unit) occurs when the engine starts.	
Does the c	operation sound occur?	I
-	>> GO TO 3.	
•	> Perform self-diagnosis for "ABS" with CONSULT-III.	J
3. SYMPT	TOM CHECK 3	-
Check syn	nptoms when electrical component (headlamps, etc.) switches are operated.	
Does the s	symptom occur?	k
	 Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit). Normal 	L
NU >		

Μ

Ν

0

Ρ

< SYMPTOM DIAGNOSIS >

VEHICLE JERKS DURING

Description

The vehicle jerks when ESP function, TCS function, ABS function, EBD function or brake limited slip differential (BLSD) function operates.

Diagnosis Procedure

INFOID:000000006601931

1.CHECK SYMPTOM

Check that the vehicle jerks when ESP function, TCS function, ABS function, EBD function or brake limited slip differential (BLSD) function operates.

Is the inspection result normal?

- YES >> Normal NO >> GO TO 2.
- 2.PERFORM SELF-DIAGNOSIS

(B) With CONSULT-III.

Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to <u>BRC-142, "DTC Index"</u>.
- NO >> GO TO 3.

3.CHECK CONNECTOR

With CONSULT-III.

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check connector terminal for deformation, disconnection and looseness.
- 4. Connect harness connector and perform self-diagnosis for "ABS" again.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Poor connection of connector terminal. Repair or replace connector terminal.

4.CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

With CONSULT-III.

Perform self-diagnosis for "ENGINE" and "TRANSMISSION" (for CVT models).

Is any DTC detected?

- YES >> Check the DTC.
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-233</u>, "<u>Removal and Installa-</u> tion".

INFOID:000000006601930

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

A

INFOID:000000006601932

[WITH ESP]

Symptom	Result	
Brake pedal slightly vibrates and operation sound (motor sound and sound from suspen- sion) occurs when ESP function, TCS function, ABS function, EBD function or brake limited differential (BLSD) function operates.	This is not a malfunction, The symptom	
Brake stopping distance may become longer than models without ABS function depending on the road conditions, when ABS function is operated on slippery road like rough road, gravel road or snowy road.	occurs ESP function, TCS function, ABS function, EBD function and brake limited differential (BLSD) function that are nor- mally operated.	
Brake pedal vibrates and operation sound occurs during sudden acceleration and corner- ing, when ESP function, TCS function or brake limited slip differential (BLSD) function is op erated.		
Brake pedal vibrates and motor sound from the engine room occurs, when the engine starts or the vehicle starts just after starting the engine.	This is not a malfunction, because it is caused by operation check of ABS actua tor and electric unit (control unit).	
Acceleration may be felt insufficient depending on the road conditions.	This is not a malfunction, because it is caused by TCS function that puts the highest priority to obtain the optimum traction (stability).	
TCS function may operate momentarily, while driving on a road where friction coefficient varies, or when downshifting, or fully depressing accelerator pedal.		
ABS warning lamp and EPS OFF indicator lamp may turn ON, when the vehicle is on a ro tating turntable or is given a strong shaking or large vibrations on a ship while the engine is running.		
ESP warning lamp may turn ON and ESP function, TCS function and brake limited slip dif ferential (BLSD) function may not normally operate, when driving on a special road the is extremely slanted (bank in a circuit course).	In this case, restart the engine on a nor- mal road. If the normal condition is re- stored, there is no malfunction. In that case, erase "ABS" self-diagnosis result	
A malfunction in yaw rate/side/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while ESP function, TCS function and brake limited slip differential (BLSD) function are OFF (ESP OFF switch is pressed and ESP OFF indicator lamp is in ON status).	memory with CONSULT-III.	
The vehicle speed does not increase, when the accelerator pedal is depressed while the vehicle is on a 2-wheel chassis dynamometer for speedometer check.	This is not a malfunction. (When checking the vehicle on a chassis dynamometer, operate ESP OFF switch so that TCS function is OFF.)	

L

Μ

Ν

Ρ

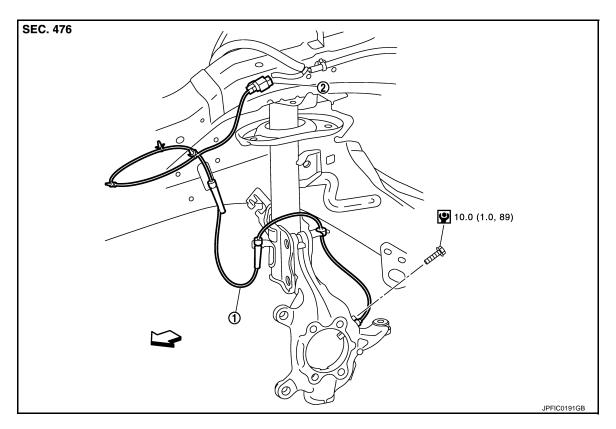
Ο

< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:000000006601933



1. Front LH wheel sensor

2. Front LH wheel sensor harness connector

<☐: Vehicle front

Let N·m (kg-m, in-lb)

NOTE:

Front RH wheel sensor is symmetrically opposite of LH.

FRONT WHEEL SENSOR : Removal and Installation

INFOID:000000006601934

REMOVAL

- 1. Remove tires.
- 2. Remove the fender protector (front). Refer to EXT-22, "Removal and Installation".
- Remove front wheel sensor from steering knuckle.
 CAUTION:
 Never rotate and never null front wheel sensor a

Never rotate and never pull front wheel sensor as much as possible, when pulling out.

 Remove front wheel sensor harness from the vehicle.
 CAUTION: Never twist or pull front wheel sensor harness, when removing.

INSTALLATION

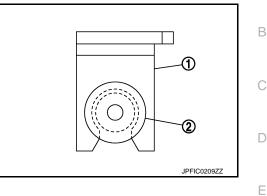
Note the following, and install in the reverse order of the removal.

BRC-224

< REMOVAL AND INSTALLATION >

• Check that there is no foreign material like iron powder or damage on inner surface of front wheel sensor mounting hole of steering knuckle and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.

• Never twist front wheel sensor harness when installing front wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that front wheel sensor harness is not twisted after installation.

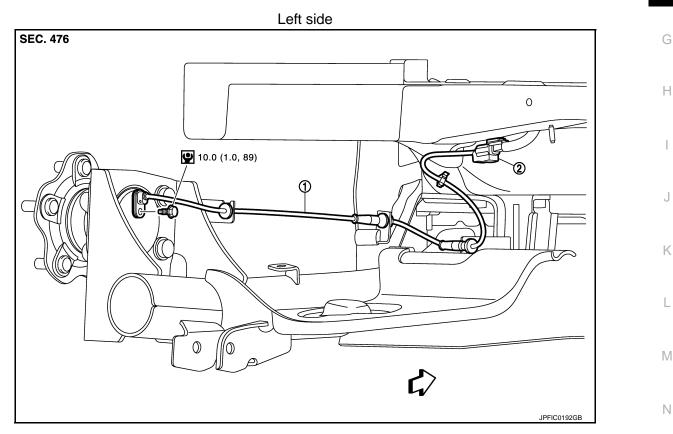


REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:000000006601935

2WD



- 1. Rear LH wheel sensor
- 2. Rear LH wheel sensor harness connector

C: Vehicle front

L: N·m (kg-m, in-lb)

BRC-225

[WITH ESP]

А

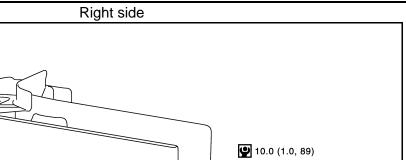
BRC

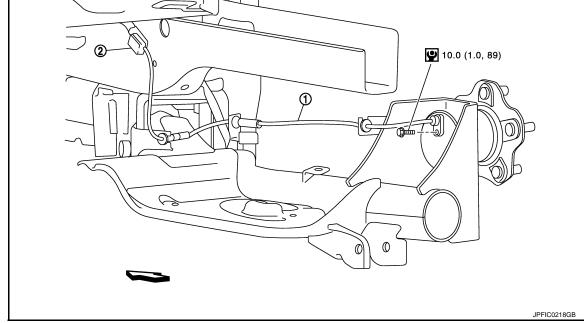
Ρ

< REMOVAL AND INSTALLATION >

SEC. 476

[WITH ESP]





- 1. Rear RH wheel sensor
- 2. Rear RH wheel sensor harness connector

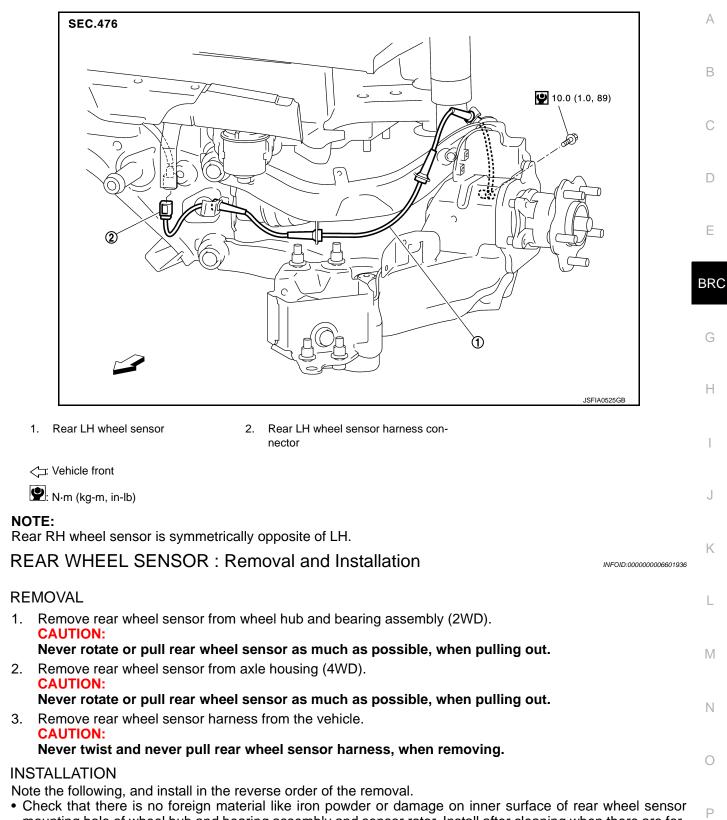
<⊐: Vehicle front

E: N·m (kg-m, in-lb)



< REMOVAL AND INSTALLATION >

[WITH ESP]

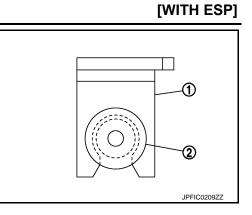


mounting hole of wheel hub and bearing assembly and sensor rotor. Install after cleaning when there are foreign material like iron powder, or replace when there is a malfunction.

BRC-227

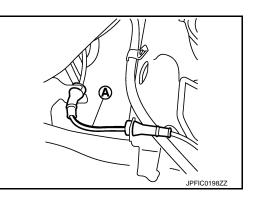
< REMOVAL AND INSTALLATION >

• Never 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.



CAUTION:

Check that the identification line (A) of the rear wheel sensor is faced upward.



SENSOR ROTOR [WITH ESP] < REMOVAL AND INSTALLATION > SENSOR ROTOR А FRONT SENSOR ROTOR FRONT SENSOR ROTOR : Removal and Installation INFOID:000000006601937 В REMOVAL Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. • MR16DDT: Refer to FAX-11, "Removal and Installation". HR16DE: Refer to FAX-43, "Removal and Installation". K9K: Refer to FAX-68, "Removal and Installation". D **INSTALLATION** Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. MR16DDT: Refer to FAX-11, "Removal and Installation". • HR16DE: Refer to FAX-43, "Removal and Installation". Е • K9K: Refer to FAX-68, "Removal and Installation". REAR SENSOR ROTOR BRC REAR SENSOR ROTOR : Removal and Installation INFOID:000000006601938 REMOVAL 2WD Replace wheel hub as an assembly when replacing because sensor rotor cannot be disassembled. Refer to RAX-5, "Removal and Installation". Н 4WD Remove drive shaft. Refer to RAX-17, "Removal and Installation". 1. 2. Remove sensor rotor from drive shaft. Refer to RAX-21, "FINAL DRIVE SIDE : Disassembly and Assembly". **INSTALLATION** Note the following, and install in the reverse order of the removal. Never reuse sensor rotor. (4WD) Κ L Μ Ν Ρ

< REMOVAL AND INSTALLATION >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

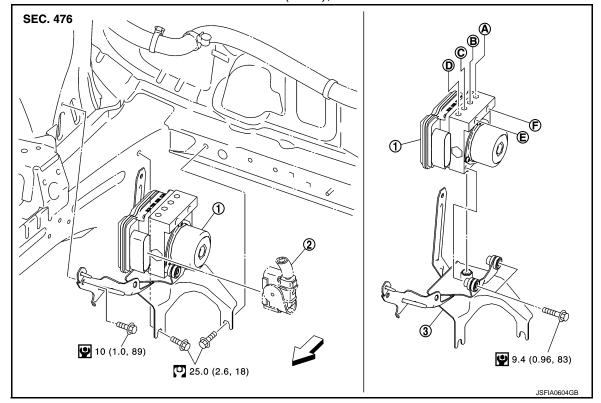
Exploded View

INFOID:000000006601939

[WITH ESP]

LHD

MR16DDT (2WD), HR16DE



- 1. ABS actuator and electric unit (control unit)
- A. To front LH caliper
- D. To front RH caliper
- \triangleleft : Vehicle front
- : N·m (kg-m, ft-lb)
- E: N·m (kg-m, in-lb)

- 2. ABS actuator and electric unit (control unit) harness connector
- B. To rear RH caliper
- E. To master cylinder secondary side
- 3. Bracket
- C. To rear LH caliper
- F. To master cylinder primary side

< REMOVAL AND INSTALLATION >

[WITH ESP]

А

В

С

D

Ε

BRC

G

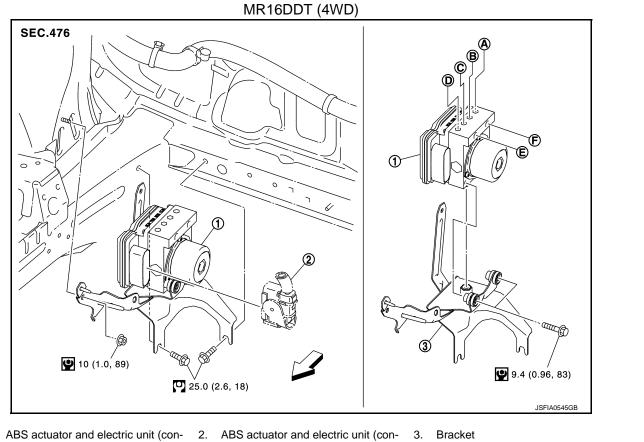
Н

J

Κ

L

Μ



- ABS actuator and electric unit (con-1. trol unit)
- A. To front LH caliper
- D. To front RH caliper
- <⊐: Vehicle front
- : N·m (kg-m, ft-lb)
- E N·m (kg-m, in-lb)

2. ABS actuator and electric unit (control unit) harness connector

E. To master cylinder secondary side

B. To rear RH caliper

- - C. To rear LH caliper
 - F. To master cylinder primary side

< REMOVAL AND INSTALLATION >

K9K

SEC.476 (A) B \bigcirc ി \cap Ē Ð 25.0 (2.6, 18) 9.4 (0.96, 83)

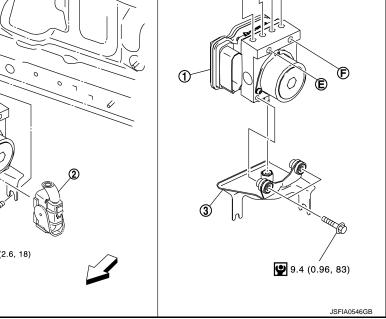
- 1. ABS actuator and electric unit (control unit)
- A. To front LH caliper
- D. To front RH caliper
- <□: Vehicle front
- : N·m (kg-m, ft-lb)
- E: N·m (kg-m, in-lb)



2. ABS actuator and electric unit (control unit) harness connector

E. To master cylinder secondary side

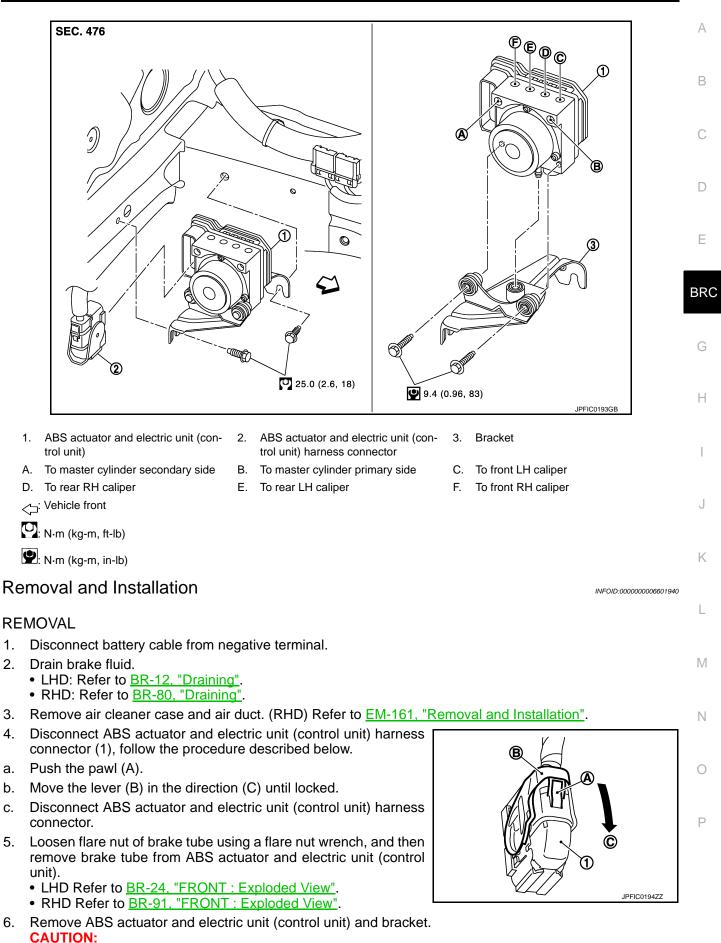
- B. To rear RH caliper
- 3. Bracket
- C. To rear LH caliper
- F. To master cylinder primary side



[WITH ESP]

< REMOVAL AND INSTALLATION >

[WITH ESP]



BRC-233

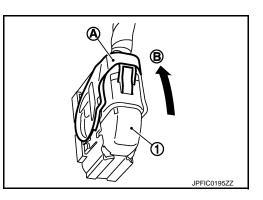
< REMOVAL AND INSTALLATION >

- Never remove and never install ABS actuator and electric unit (control unit) by holding harness connector.
- Be careful not to drop ABS actuator and electric unit (control unit) and apply excessive impact to it.
- 7. Remove bracket and bushing from ABS actuator and electric unit (control unit).

INSTALLATION

Note the following, and install in the reverse order of removal.

- When replacing with a new ABS actuator and electric unit (control unit), never remove the protector of the brake tube mounting hole until right before the brake tube is installed.
- When installing brake tube, tighten to the specified torque using a flare nut torque wrench so that flare nut and brake tube are not damaged.
- LHD: Refer to <u>BR-24</u>, "FRONT : Exploded View".
- RHD: Refer to BR-91, "FRONT : Exploded View".
- Never remove and install ABS actuator and electric unit (control unit) by holding actuator harness.
- Bleed air from brake piping after installation.
- LHD: Refer to BR-13, "Bleeding Brake System".
- RHD: Refer to BR-81, "Bleeding Brake System".
- Never apply excessive impact to actuator, such as by dropping it.
- After installing the ABS actuator and electric unit (control unit) harness connector (1), move the lever (A) in the direction (B) to secure the locking.



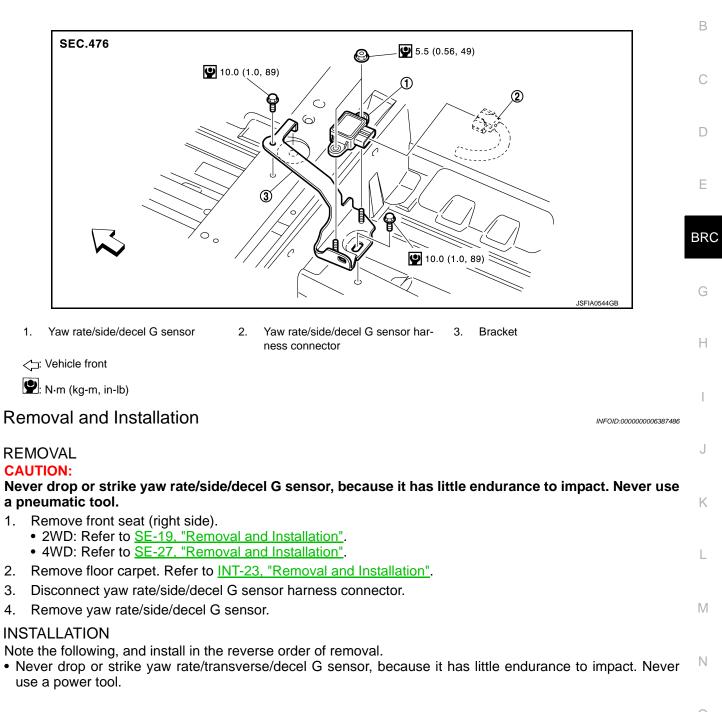
[WITH ESP]

< REMOVAL AND INSTALLATION >

YAW RATE/SIDE/DECEL G SENSOR

Exploded View

INFOID:000000006387485



Ρ

[WITH ESP]

А

STEERING ANGLE SENSOR

INFOID:000000006387487

Removal and Installation

REMOVAL

- 1. Remove spiral cable assembly. Refer to <u>SR-16, "Removal and Installation"</u>.
- 2. Remove steering angle sensor.

INSTALLATION

Note the following, and install in the reverse order of removal.

• Perform steering angle sensor neutral position adjustment when steering angle sensor is removed and installed, or replaced. Refer to <u>BRC-149, "Work Procedure"</u>.

< REMOVAL AND INSTALLATION >

[WITH	ESP]
-	

ESP OFF SWITCH		Δ
Removal and Installation	INFOID:000000006387488	~
REMOVAL Remove lower instrument panel. Refer to <u>IP-13, "Removal and Installation"</u>. 		В
2. Remove ESP OFF switch.		С
INSTALLATION Installation is the reverse order of removal.		
		D

Е

BRC

G

- Н

Ι

J

Κ

L

M

Ν

0

Ρ