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B
C
D
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SECTION **BRC**

BRAKE CONTROL SYSTEM

CONTENTS

		BRC
TYPE 1	VDC FUNCTION : System Diagram26	
	VDC FUNCTION : System Description26	
PRECAUTION 7	TCS FUNCTION 28	
PRECAUTIONS 7	TCS FUNCTION : System Diagram29	G
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"7	TCS FUNCTION : System Description29	
Precaution for Brake System7	ABS FUNCTION 30	H
Precaution for Brake Control System8	ABS FUNCTION : System Diagram30	
Precaution for Harness Repair8	ABS FUNCTION : System Description31	
PREPARATION 9	EBD FUNCTION 31	I
PREPARATION 9	EBD FUNCTION : System Diagram32	
Special Service Tool9	EBD FUNCTION : System Description32	J
Commercial Service Tools9	HILL START ASSIST FUNCTION 33	
SYSTEM DESCRIPTION10	Hill start assist FUNCTION : System Diagram34	K
APPLICATION NOTICE10	Hill start assist FUNCTION : System Description34	
Application Notice10	DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)] 36	L
COMPONENT PARTS11	CONSULT Function36	
Component Parts Location11	ECU DIAGNOSIS INFORMATION 41	M
Component Description12	APPLICATION NOTICE 41	
ABS Actuator and Electric Unit (Control Unit)12	Application Notice41	N
Wheel Sensor and Sensor Rotor13	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) 42	
Stop Lamp Switch13	Reference Value42	O
Steering Angle Sensor13	Fail-Safe44	
Yaw Rate/Side/Decel G Sensor13	DTC Inspection Priority Chart46	P
Brake Fluid Level Switch14	DTC Index47	
Vacuum Sensor14	WIRING DIAGRAM 49	
Parking Brake Switch14	BRAKE CONTROL SYSTEM 49	
VDC OFF Switch14	Wiring Diagram49	
SYSTEM15	BASIC INSPECTION 57	
System Diagram15	APPLICATION NOTICE 57	
System Description15		
Fail-Safe23		
VDC FUNCTION25		

Application Notice	57	DTC Description	97
		Diagnosis Procedure	97
DIAGNOSIS AND REPAIR WORK FLOW	58	C1130 ENGINE SIGNAL	99
Work Flow	58	DTC Description	99
Diagnostic Work Sheet	59	Diagnosis Procedure	99
ADDITIONAL SERVICE WHEN REPLACING ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	61	C1140 ACTUATOR RELAY SYSTEM	101
Description	61	DTC Description	101
Work Procedure	61	Diagnosis Procedure	101
ADJUSTMENT OF STEERING ANGLE SEN- SOR NEUTRAL POSITION	62	C1142 PRESS SENSOR	103
Description	62	DTC Description	103
Work Procedure	62	Diagnosis Procedure	103
CALIBRATION OF DECEL G SENSOR	64	C1143 STEERING ANGLE SENSOR	106
Description	64	DTC Description	106
Work Procedure	64	Diagnosis Procedure	106
DTC/CIRCUIT DIAGNOSIS	66	C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT	110
APPLICATION NOTICE	66	DTC Description	110
Application Notice	66	Diagnosis Procedure	110
C1101, C1102, C1103, C1104 WHEEL SEN- SOR	67	C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR	112
DTC Description	67	DTC Description	112
Diagnosis Procedure	68	Diagnosis Procedure	112
C1105, C1106, C1107, C1108 WHEEL SEN- SOR	72	C1155 BRAKE FLUID LEVEL SWITCH	115
DTC Description	72	DTC Description	115
Diagnosis Procedure	73	Diagnosis Procedure	115
		Component Inspection	118
C1109 POWER AND GROUND SYSTEM	79	C1160 INCOMPLETE DECEL G SENSOR CALIBRATION	119
DTC Description	79	DTC Description	119
Diagnosis Procedure	79	Diagnosis Procedure	119
C1111 ABS MOTOR, MOTOR RELAY SYS- TEM	81	C1164, C1165 CV SYSTEM	121
DTC Description	81	DTC Description	121
Diagnosis Procedure	81	Diagnosis Procedure	121
C1115 WHEEL SENSOR	84	C1170 VARIANT CODING	123
DTC Description	84	DTC Description	123
Diagnosis Procedure	84	Diagnosis Procedure	123
C1116 STOP LAMP SWITCH	91	C1197 VACUUM SENSOR	124
DTC Description	91	DTC Description	124
Diagnosis Procedure	92	Diagnosis Procedure	124
Component Inspection	94	C1198 VACUUM SENSOR	127
C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM	95	DTC Description	127
DTC Description	95	Diagnosis Procedure	127
Diagnosis Procedure	95	C1199 BRAKE BOOSTER	129
C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM	97	DTC Description	129
		Diagnosis Procedure	129
		C119A VACUUM SENSOR	132
		DTC Description	132
		Diagnosis Procedure	132

U1000 CAN COMM CIRCUIT	135	VEHICLE JERKS DURING VDC/TCS/ABS CONTROL	153	A
DTC Description	135	Description	153	
Diagnosis Procedure	135	Diagnosis Procedure	153	
POWER SUPPLY AND GROUND CIRCUIT ...	136	NORMAL OPERATING CONDITION	154	B
Diagnosis Procedure	136	Description	154	
PARKING BRAKE SWITCH	139	UNIT REMOVAL AND INSTALLATION ...	155	C
Description	139	WHEEL SENSOR	155	D
Component Function Check	139	Exploded View - Front Wheel Sensor	155	
Diagnosis Procedure	139	Removal and Installation - Front Wheel Sensor ...	155	
Component Inspection	139	Exploded View - Rear Wheel Sensor	156	
VDC OFF SWITCH	140	Removal and Installation - Rear Wheel Sensor	157	E
Component Function Check	140	SENSOR ROTOR	159	
Diagnosis Procedure	140	Removal and Installation - Front Sensor Rotor	159	
Component Inspection	141	Removal and Installation - Rear Sensor Rotor	159	BRC
ABS WARNING LAMP	142	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	160	G
Component Function Check	142	Exploded View	160	
Diagnosis Procedure	142	Removal and Installation	160	
BRAKE WARNING LAMP	143	YAW RATE/SIDE/DECEL G SENSOR	162	H
Component Function Check	143	Exploded View	162	
Diagnosis Procedure	143	Removal and Installation	162	
VDC OFF INDICATOR LAMP	144	VDC OFF SWITCH	163	I
Component Function Check	144	Removal and Installation	163	
Diagnosis Procedure	144	STEERING ANGLE SENSOR	164	J
SLIP INDICATOR LAMP	145	Removal and Installation	164	
Component Function Check	145			
Diagnosis Procedure	145			
SYMPTOM DIAGNOSIS	146			
APPLICATION NOTICE	146			
Application Notice	146	TYPE 2		
VDC/TCS/ABS	147	PRECAUTION	165	K
Symptom Table	147	PRECAUTIONS	165	L
EXCESSIVE OPERATION FREQUENCY	148	Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	165	
Description	148	Precaution for Brake System	165	M
Diagnosis Procedure	148	Precaution for Brake Control System	166	
UNEXPECTED BRAKE PEDAL REACTION ..	149	Precaution for Harness Repair	166	
Description	149	PREPARATION	167	N
Diagnosis Procedure	149	PREPARATION	167	
THE BRAKING DISTANCE IS LONG	150	Special Service Tool	167	O
Description	150	Commercial Service Tools	167	
Diagnosis Procedure	150	SYSTEM DESCRIPTION	168	P
ABS FUNCTION DOES NOT OPERATE	151	APPLICATION NOTICE	168	
Description	151	Application Notice	168	
Diagnosis Procedure	151	COMPONENT PARTS	169	
BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS	152	Component Parts Location	169	
Description	152	Component Description	170	
Diagnosis Procedure	152	ABS Actuator and Electric Unit (Control Unit)	170	
		Wheel Sensor and Sensor Rotor	171	

Stop Lamp Switch	171	BASIC INSPECTION	216
Steering Angle Sensor	171	APPLICATION NOTICE	216
Yaw Rate/Side/Decel G Sensor	171	Application Notice	216
Brake Fluid Level Switch	172	DIAGNOSIS AND REPAIR WORK FLOW	217
Vacuum Sensor	172	Work Flow	217
Parking Brake Switch	172	Diagnostic Work Sheet	218
VDC OFF Switch	172	ADDITIONAL SERVICE WHEN REPLACING	
SYSTEM	173	ABS ACTUATOR AND ELECTRIC UNIT	
System Diagram	173	(CONTROL UNIT)	220
System Description	173	Description	220
Fail-Safe	181	Work Procedure	220
VDC FUNCTION	183	ADJUSTMENT OF STEERING ANGLE SEN-	
VDC FUNCTION : System Diagram	184	SOR NEUTRAL POSITION	221
VDC FUNCTION : System Description	184	Description	221
TCS FUNCTION	186	Work Procedure	221
TCS FUNCTION : System Diagram	187	CALIBRATION OF DECEL G SENSOR	223
TCS FUNCTION : System Description	187	Description	223
ABS FUNCTION	188	Work Procedure	223
ABS FUNCTION : System Diagram	188	DTC/CIRCUIT DIAGNOSIS	225
ABS FUNCTION : System Description	189	APPLICATION NOTICE	225
EBD FUNCTION	189	Application Notice	225
EBD FUNCTION : System Diagram	190	C1101, C1102, C1103, C1104 WHEEL SEN-	
EBD FUNCTION : System Description	190	SOR	226
HILL START ASSIST FUNCTION	191	DTC Description	226
Hill start assist FUNCTION : System Diagram	192	Diagnosis Procedure	227
Hill start assist FUNCTION : System Description	192	C1105, C1106, C1107, C1108 WHEEL SEN-	
HILL DESCENT CONTROL (DOWNHILL DRIVE		SOR	231
SUPPORT) FUNCTION	193	DTC Description	231
hill descent control (Downhill Drive Support)		Diagnosis Procedure	232
FUNCTION : System Diagram	193	C1109 POWER AND GROUND SYSTEM	238
hill descent control (Downhill Drive Support)		DTC Description	238
FUNCTION : System Description	193	Diagnosis Procedure	238
DIAGNOSIS SYSTEM [ABS ACTUATOR		C1111 ABS MOTOR, MOTOR RELAY SYS-	
AND ELECTRIC UNIT (CONTROL UNIT)]	195	TEM	240
CONSULT Function	195	DTC Description	240
ECU DIAGNOSIS INFORMATION	200	Diagnosis Procedure	240
APPLICATION NOTICE	200	C1115 WHEEL SENSOR	243
Application Notice	200	DTC Description	243
ABS ACTUATOR AND ELECTRIC UNIT		Diagnosis Procedure	243
(CONTROL UNIT)	201	C1116 STOP LAMP SWITCH	250
Reference Value	201	DTC Description	250
Fail-Safe	203	Diagnosis Procedure	251
DTC Inspection Priority Chart	205	Component Inspection	253
DTC Index	206	C1120, C1122, C1124, C1126 ABS IN VALVE	
WIRING DIAGRAM	208	SYSTEM	254
BRAKE CONTROL SYSTEM	208	DTC Description	254
Wiring Diagram	208	Diagnosis Procedure	254

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM	256	C119A VACUUM SENSOR	291	A
DTC Description	256	DTC Description	291	
Diagnosis Procedure	256	Diagnosis Procedure	291	
C1130 ENGINE SIGNAL	258	U1000 CAN COMM CIRCUIT	294	B
DTC Description	258	DTC Description	294	
Diagnosis Procedure	258	Diagnosis Procedure	294	
C1140 ACTUATOR RELAY SYSTEM	260	POWER SUPPLY AND GROUND CIRCUIT ..	295	C
DTC Description	260	Diagnosis Procedure	295	
Diagnosis Procedure	260	Hill descent control SWITCH	298	D
C1142 PRESS SENSOR	262	Description	298	
DTC Description	262	Component Function Check	298	
Diagnosis Procedure	262	Diagnosis Procedure	298	
C1143 STEERING ANGLE SENSOR	265	Component Inspection	299	E
DTC Description	265	Special Repair Requirement	299	
Diagnosis Procedure	265	PARKING BRAKE SWITCH	300	BRC
C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT	269	Description	300	
DTC Description	269	Component Function Check	300	G
Diagnosis Procedure	269	Diagnosis Procedure	300	
C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR	271	Component Inspection	300	
DTC Description	271	VDC OFF SWITCH	301	H
Diagnosis Procedure	271	Component Function Check	301	
C1155 BRAKE FLUID LEVEL SWITCH	274	Diagnosis Procedure	301	
DTC Description	274	Component Inspection	302	
Diagnosis Procedure	274	ABS WARNING LAMP	303	I
Component Inspection	277	Component Function Check	303	
C1160 INCOMPLETE DECEL G SENSOR CALIBRATION	278	Diagnosis Procedure	303	J
DTC Description	278	BRAKE WARNING LAMP	304	
Diagnosis Procedure	278	Component Function Check	304	
C1164, C1165 CV SYSTEM	280	Diagnosis Procedure	304	K
DTC Description	280	Hill descent control INDICATOR LAMP	305	
Diagnosis Procedure	280	Description	305	
C1170 VARIANT CODING	282	Component Function Check	305	L
DTC Description	282	Diagnosis Procedure	305	
Diagnosis Procedure	282	Special Repair Requirement	305	
C1197 VACUUM SENSOR	283	VDC OFF INDICATOR LAMP	306	M
DTC Description	283	Component Function Check	306	
Diagnosis Procedure	283	Diagnosis Procedure	306	
C1198 VACUUM SENSOR	286	SLIP INDICATOR LAMP	307	N
DTC Description	286	Component Function Check	307	
Diagnosis Procedure	286	Diagnosis Procedure	307	
C1199 BRAKE BOOSTER	288	SYMPTOM DIAGNOSIS	308	O
DTC Description	288	APPLICATION NOTICE	308	
Diagnosis Procedure	288	Application Notice	308	P
		VDC/TCS/ABS	309	
		Symptom Table	309	
		EXCESSIVE OPERATION FREQUENCY	310	
		Description	310	
		Diagnosis Procedure		

UNEXPECTED BRAKE PEDAL REACTION .	311	WHEEL SENSOR	317
Description	311	Exploded View - Front Wheel Sensor	317
Diagnosis Procedure	311	Removal and Installation - Front Wheel Sensor ..	317
THE BRAKING DISTANCE IS LONG	312	Exploded View - Rear Wheel Sensor	318
Description	312	Removal and Installation - Rear Wheel Sensor ...	319
Diagnosis Procedure	312	SENSOR ROTOR	321
ABS FUNCTION DOES NOT OPERATE	313	Removal and Installation - Front Sensor Rotor	321
Description	313	Removal and Installation - Rear Sensor Rotor	321
Diagnosis Procedure	313	ABS ACTUATOR AND ELECTRIC UNIT	
BRAKE PEDAL VIBRATION OR OPERA-		(CONTROL UNIT)	322
TION SOUND OCCURS	314	Exploded View	322
Description	314	Removal and Installation	322
Diagnosis Procedure	314	YAW RATE/SIDE/DECEL G SENSOR	324
VEHICLE JERKS DURING VDC/TCS/ABS		Exploded View	324
CONTROL	315	Removal and Installation	324
Description	315	STEERING ANGLE SENSOR	325
Diagnosis Procedure	315	Removal and Installation	325
NORMAL OPERATING CONDITION	316	VDC OFF SWITCH	326
Description	316	Removal and Installation	326
UNIT REMOVAL AND INSTALLATION ...	317	HILL DESCENT CONTROL SWITCH	327
		Removal and Installation	327

PRECAUTION

PRECAUTIONS

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

INFOID:000000012551791

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

WARNING:

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

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

WARNING:

- When working near the 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 or batteries, and wait at least three minutes before performing any service.

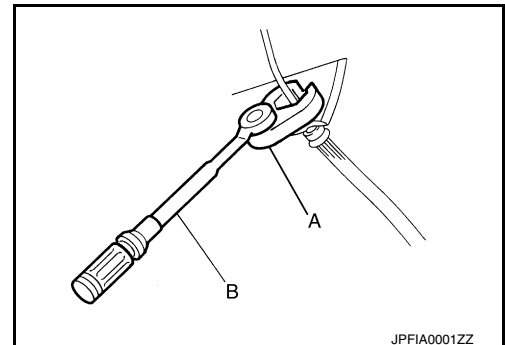
Precaution for Brake System

INFOID:000000012551792

WARNING:

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

- Brake fluid use refer to [MA-17. "FOR USA AND CANADA : Fluids and Lubricants"](#) (United States and Canada) or [MA-19. "FOR MEXICO : Fluids and Lubricants"](#) (Mexico).
- Do not reuse drained brake fluid.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Do not use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with a crow-foot (A) and torque wrench (B).
- Always connect the battery terminal when moving the vehicle.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



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PRECAUTIONS

< PRECAUTION >

[TYPE 1]

Precaution for Brake Control System

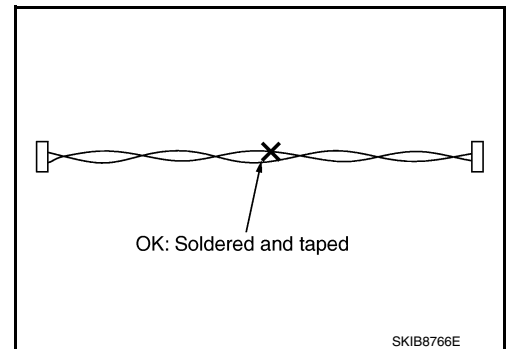
INFOID:000000012551793

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

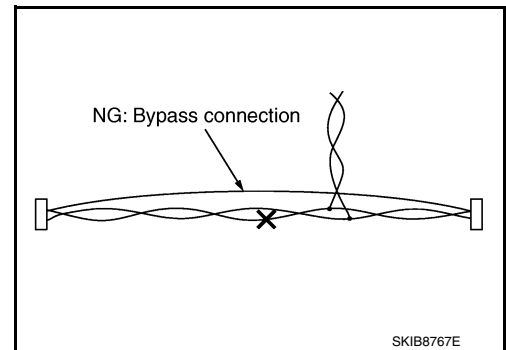
Precaution for Harness Repair

INFOID:000000012551794

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



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



PREPARATION

< PREPARATION >

[TYPE 1]

PREPARATION

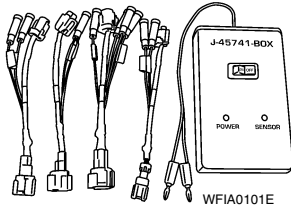
PREPARATION

Special Service Tool

INFOID:0000000012551795

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

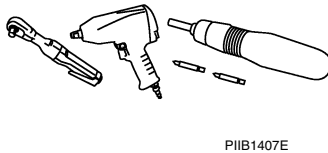
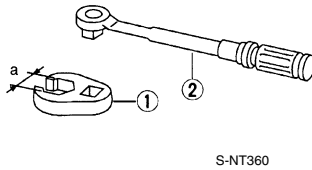
Tool number (TechMate No.) Tool name	Description
KV991J0080 (J-45741) ABS active wheel sensor tester	Checking operation of ABS active wheel sensors



Commercial Service Tools

INFOID:0000000012551796

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



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APPLICATION NOTICE

< SYSTEM DESCRIPTION >

[TYPE 1]

SYSTEM DESCRIPTION

APPLICATION NOTICE

Application Notice

INFOID:0000000012551797

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

COMPONENT PARTS

< SYSTEM DESCRIPTION >

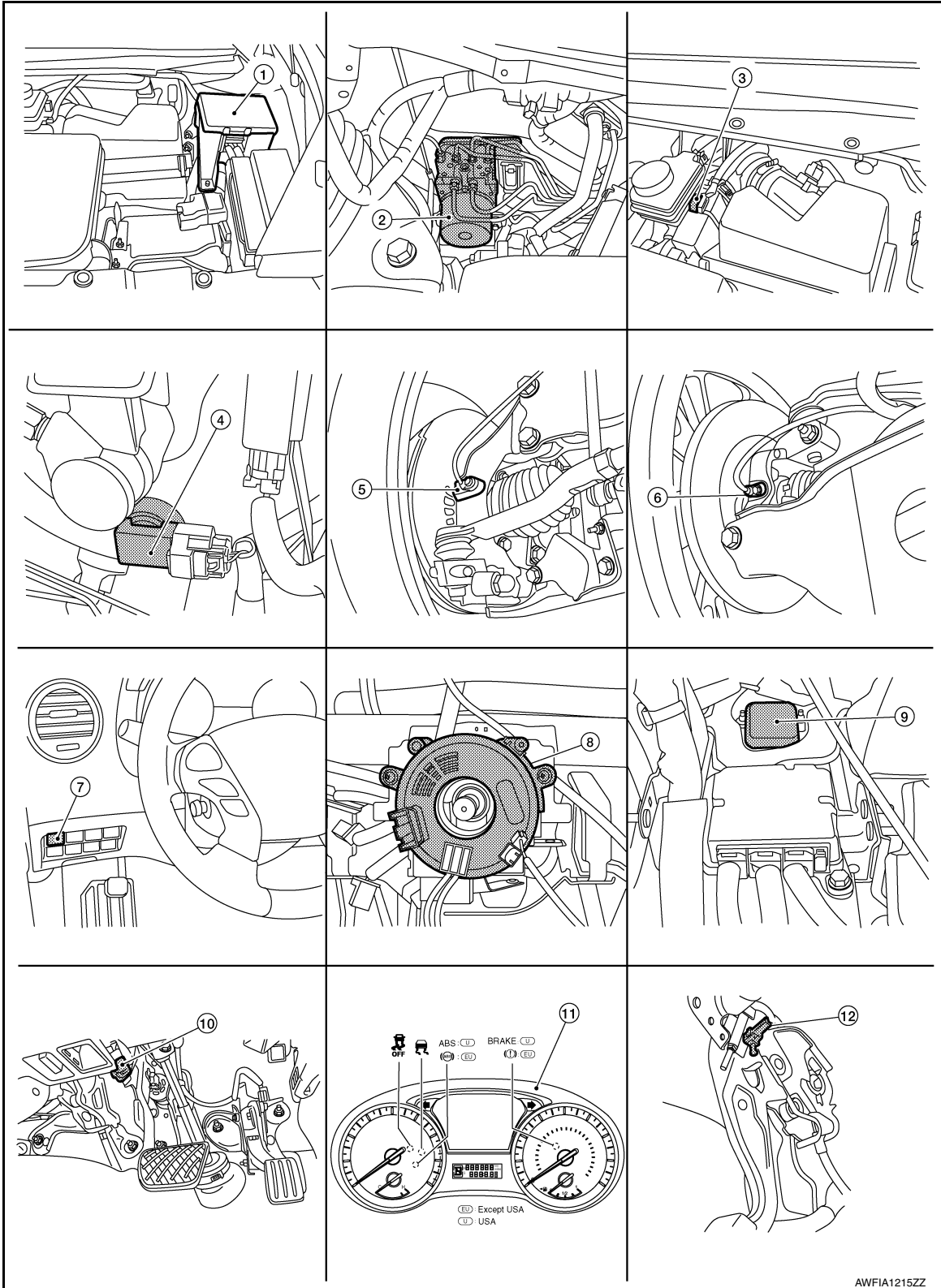
[TYPE 1]

COMPONENT PARTS

Component Parts Location

INFOID:000000012551798

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

[TYPE 1]

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

Component Description

INFOID:0000000012551799

Component		Reference/Function
ABS actuator and electric unit (control unit)	Pump/motor	BRC-12. "ABS Actuator and Electric Unit (Control Unit)"
	Motor relay	
	Actuator relay (main relay)	
	ABS IN valve	
	ABS OUT valve	
	Cut valve 1	
	Cut valve 2	
	Pressure sensor	
Wheel sensor	BRC-13. "Wheel Sensor and Sensor Rotor"	
Stop lamp switch	BRC-13. "Stop Lamp Switch"	
Steering angle sensor	BRC-13. "Steering Angle Sensor"	
Yaw rate/side/decel G sensor	BRC-13. "Yaw Rate/Side/Decel G Sensor"	
Vacuum sensor	BRC-14. "Vacuum Sensor"	
Brake fluid level switch	BRC-14. "Brake Fluid Level Switch"	
Parking brake switch	BRC-14. "Parking Brake Switch"	
VDC OFF switch	BRC-14. "VDC OFF Switch"	
ECM	<p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal <p>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Target throttle position signal 	
TCM	<p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> • Shift position signal • Current gear position signal 	
ABS warning lamp	BRC-15. "System Description"	
Brake warning lamp		
VDC OFF indicator lamp		
SLIP indicator lamp		

ABS Actuator and Electric Unit (Control Unit)

INFOID:0000000012551800

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

ELECTRIC UNIT (CONTROL UNIT)

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

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[TYPE 1]

ACTUATOR

The following components are integrated with ABS actuator.

Pump

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

Motor

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

Motor Relay

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

Actuator Relay

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

ABS IN Valve and ABS OUT Valve

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

Pressure Sensor

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

Cut Valve 1 (Primary Line), Cut Valve 2 (Secondary Line)

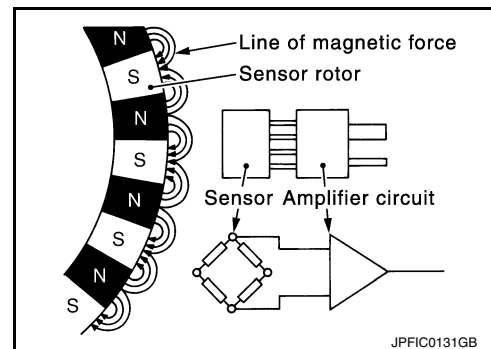
Shuts off the ordinary brake line from master cylinder when VDC function, TCS function and hill start assist function are activated.

Wheel Sensor and Sensor Rotor

INFOID:0000000012551801

NOTE:

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



Stop Lamp Switch

INFOID:0000000012551802

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

Steering Angle Sensor

INFOID:0000000012551803

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

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

Yaw Rate/Side/Decel G Sensor

INFOID:0000000012551804

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

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

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

[TYPE 1]

Brake Fluid Level Switch

INFOID:0000000012551805

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

Vacuum Sensor

INFOID:0000000012551806

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

Parking Brake Switch

INFOID:0000000012551807

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

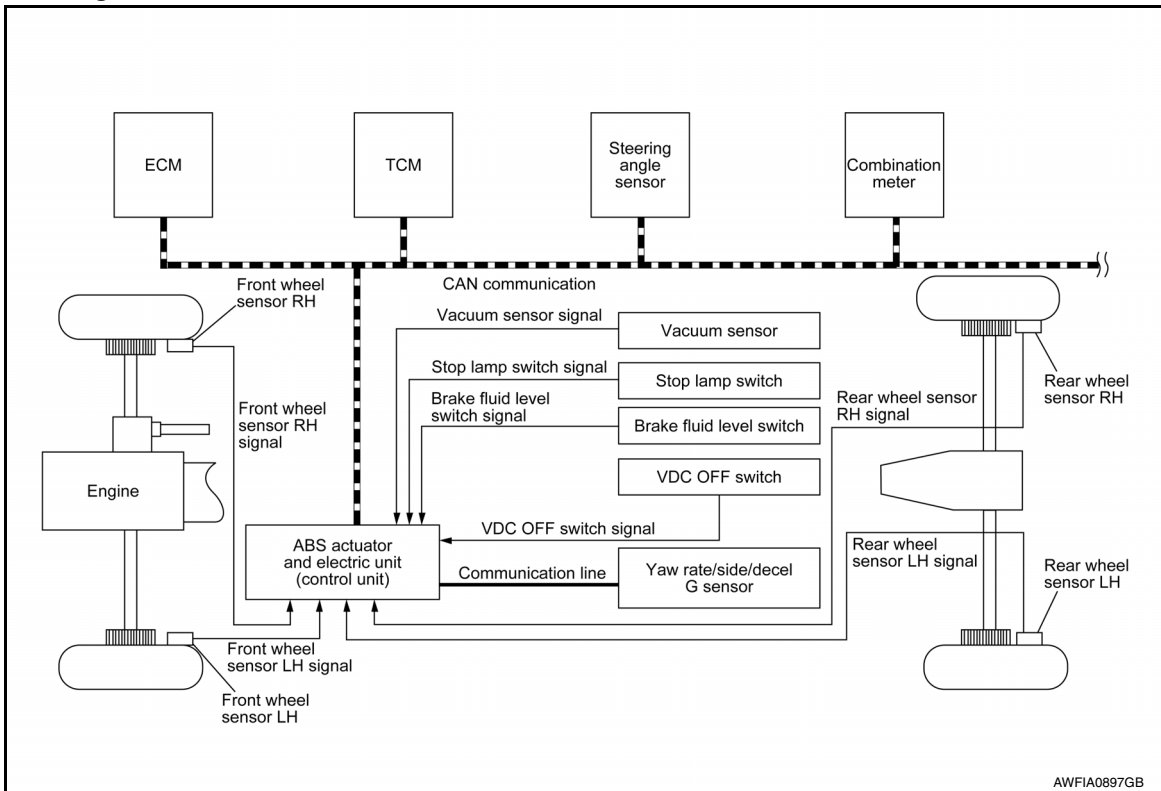
VDC OFF Switch

INFOID:0000000012551808

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

SYSTEM

System Diagram



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System Description

INFOID:000000012551810

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

INPUT SIGNAL AND OUTPUT SIGNAL

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

VDC function, TCS function, ABS function and EBD function

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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • Target throttle position signal
TCM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Shift position signal

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SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

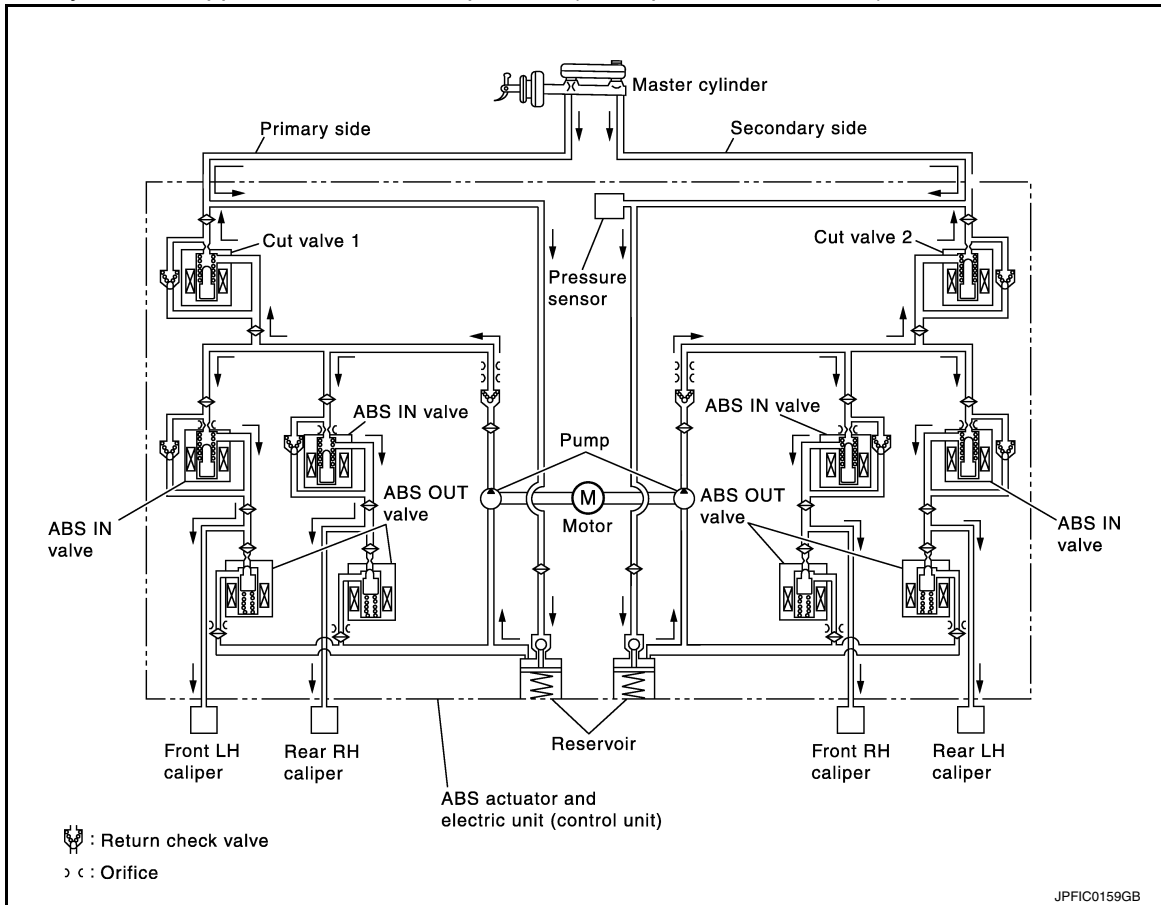
Component	Signal description
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • Steering angle sensor signal
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • ABS warning lamp signal • Brake warning lamp signal • VDC warning lamp signal • VDC OFF indicator lamp

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

VALVE OPERATION (ABS AND EBD)

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

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



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

When front RH wheel caliper pressure increases

SYSTEM

[TYPE 1]

< SYSTEM DESCRIPTION >

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

When front LH wheel caliper pressure increases

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

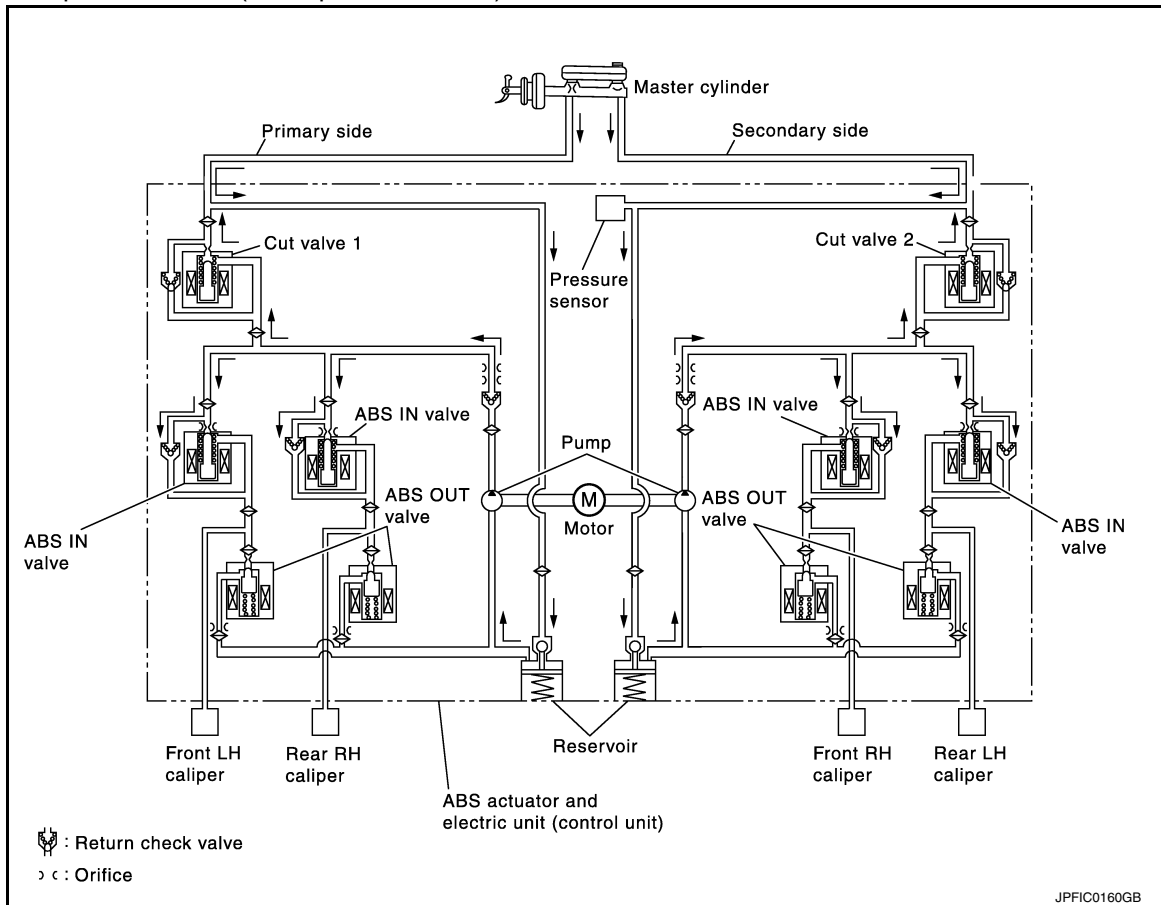
When rear RH wheel caliper pressure increases

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

When rear LH wheel caliper pressure increases

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

When ABS operation starts (when pressure holds)



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

When front RH wheel caliper pressure holds

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

When front LH wheel caliper pressure holds

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

SYSTEM

[TYPE 1]

< SYSTEM DESCRIPTION >

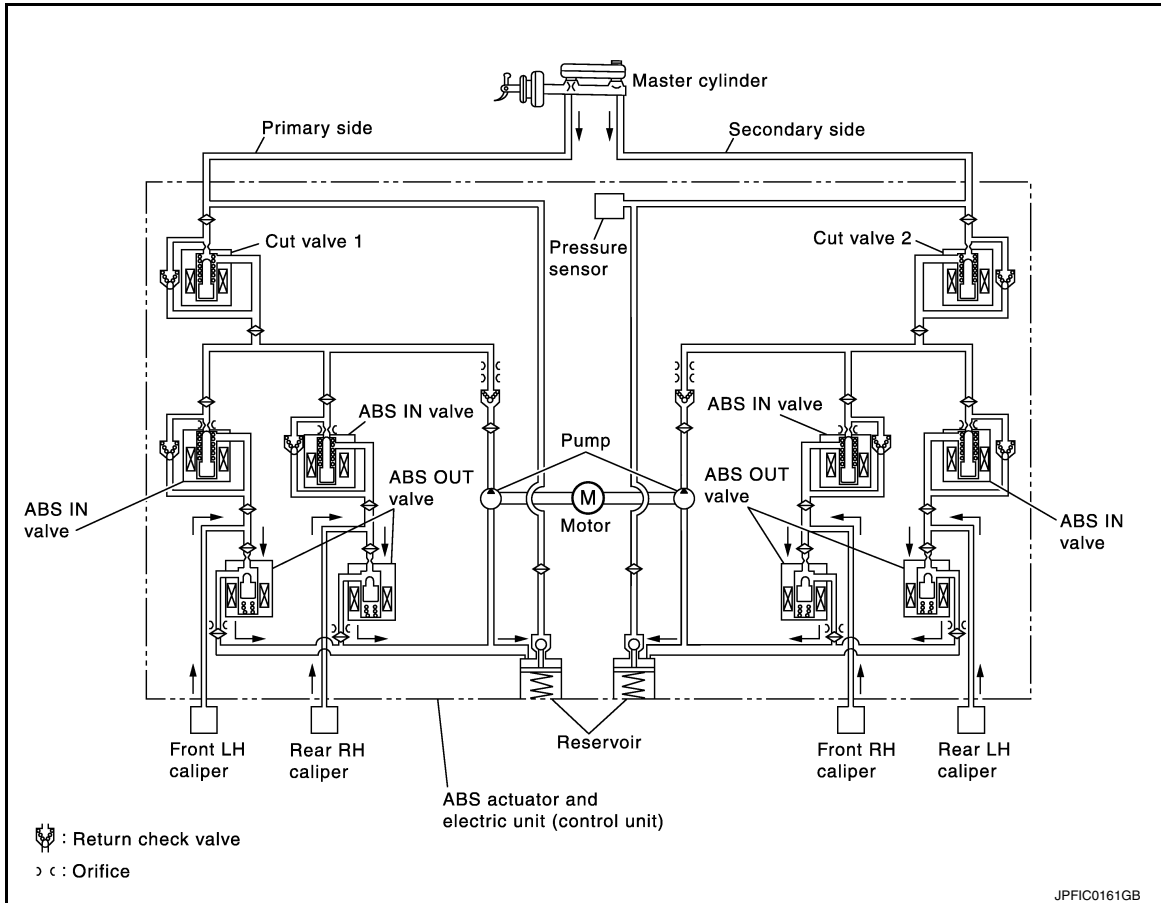
When rear RH wheel caliper pressure holds

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

When rear LH wheel caliper pressure holds

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

ABS is in operation (when pressure decreases)



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

When front RH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When front LH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When rear RH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When rear LH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

Component Parts and Function

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

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

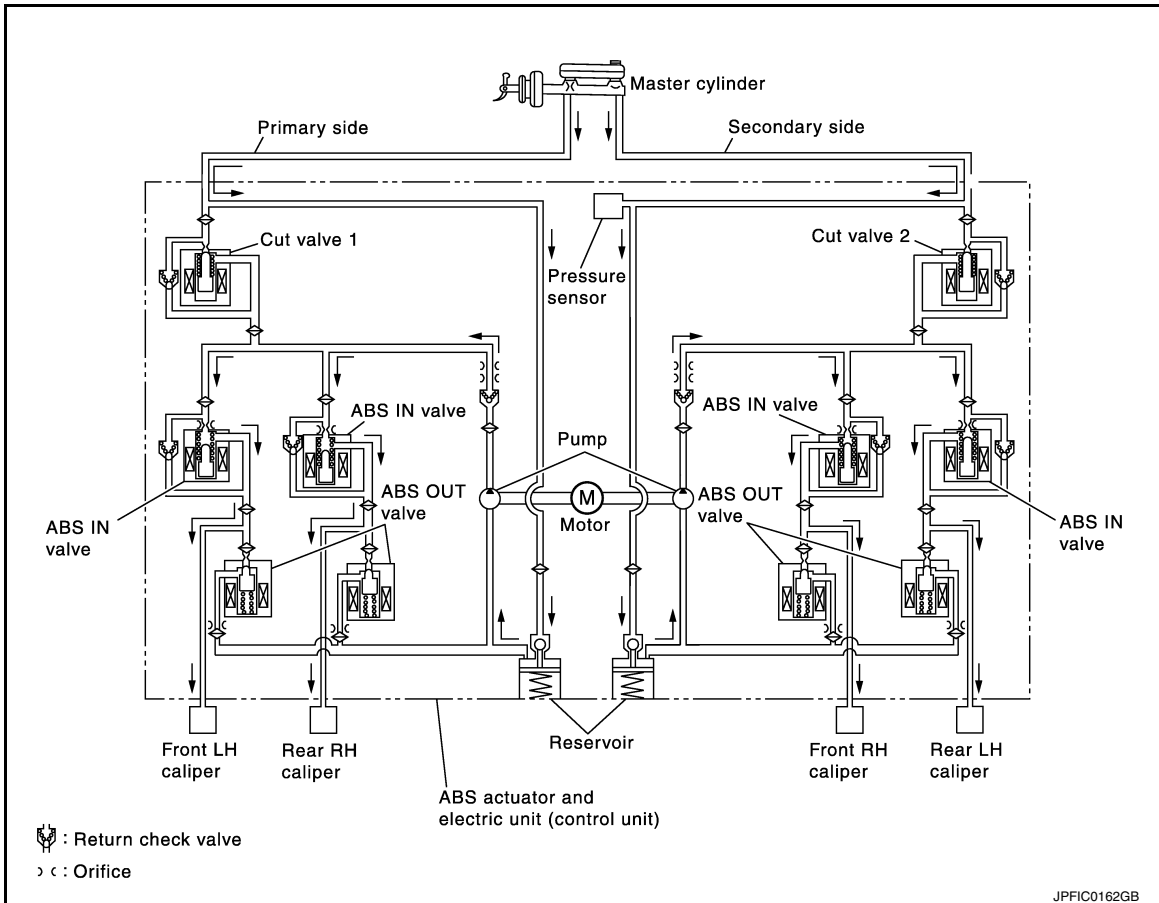
VALVE OPERATION (OTHER THAN ABS AND EBD)

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

NOTE:

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

When Pressure Increases



SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

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

When front RH wheel caliper pressure increases

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

When front LH wheel caliper pressure increases

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

When rear RH wheel caliper pressure increases

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

When rear LH wheel caliper pressure increases

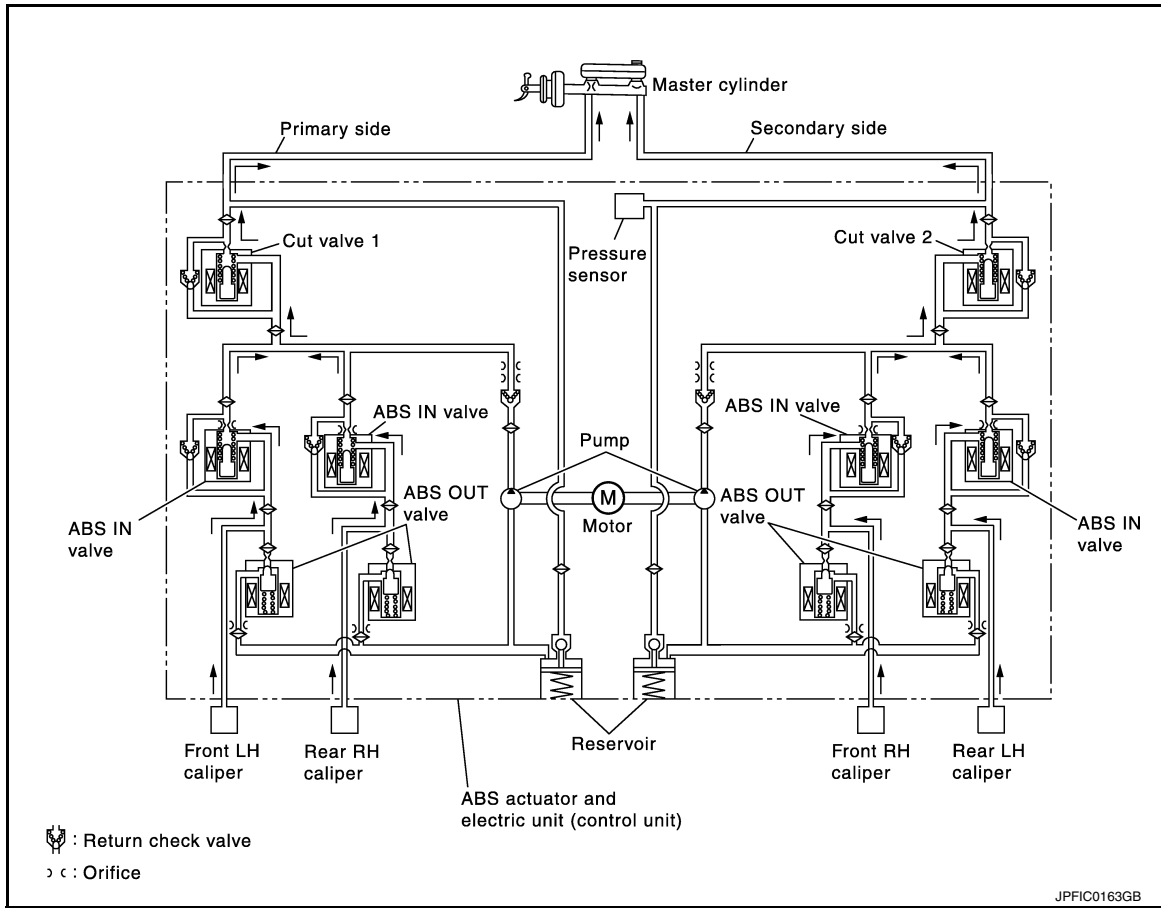
- Motor is activated. Brake fluid from pump is supplied to front LH wheel caliper through ABS IN valve. For other wheel, ABS IN valve is closed and brakes fluid is not supplied to caliper.

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

Released



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

When front RH wheel caliper pressure decreases

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

When front LH wheel caliper pressure decreases

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

When rear RH wheel caliper pressure decreases

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

When rear LH wheel caliper pressure decreases

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

Component Parts and Function

Component	Function
Reservoir	Temporarily reserves the brake fluid drained from brake caliper so that pressure efficiently decreases when decreasing pressure of brake caliper.
Pump	Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.
Motor	Drives the pump according to signals from control unit.
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit.

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

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

CONDITIONS FOR TURNING ON THE WARNING LAMP

ABS Warning Lamp

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

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

Brake Warning Lamp

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

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

VDC Warning Lamp

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

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

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

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

CONDITIONS FOR TURNING ON THE INDICATOR LAMP

VDC OFF indicator lamp

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

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

Fail-Safe

INFOID:000000012551811

VDC FUNCTION, TCS FUNCTION and hill start assist FUNCTION

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

ABS FUNCTION

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

NOTE:

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

EBD FUNCTION

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

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

DTC	Malfunction detected condition	Fail-safe condition
C1101	When an open circuit is detected in rear RH wheel sensor circuit.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function (only when both 2 rear wheels are malfunctioning) • hill start assist function
C1102	When an open circuit is detected in rear LH wheel sensor circuit.	
C1103	When an open circuit is detected in front RH wheel sensor circuit.	
C1104	When an open circuit is detected in front LH wheel sensor circuit.	
C1105	<ul style="list-style-type: none"> • When power supply voltage of rear RH wheel sensor is low. • When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. • When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. 	
C1106	<ul style="list-style-type: none"> • When power supply voltage of rear LH wheel sensor is low. • When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. • When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. 	
C1107	<ul style="list-style-type: none"> • When power supply voltage of front RH wheel sensor is low. • When distance between front RH wheel sensor and front RH wheel sensor rotor is large. • When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. 	
C1108	<ul style="list-style-type: none"> • When power supply voltage of front LH wheel sensor is low. • When distance between front LH wheel sensor and front LH wheel sensor rotor is large. • When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. 	
C1109	<ul style="list-style-type: none"> • When ignition voltage is 10 V or less. • When ignition voltage is 16 V or more. 	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1111	When a malfunction is detected in motor or motor relay.	
C1115	When difference in wheel speed between any wheel and others is detected during the vehicle is driven, because of installation of other tires than specified.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • hill start assist function
C1116	When stop lamp switch signal is not input when brake pedal operates.	
C1120	When a malfunction is detected in front LH ABS IN valve.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1121	When a malfunction is detected in front LH ABS OUT valve.	
C1122	When a malfunction is detected in front RH ABS IN valve.	
C1123	When a malfunction is detected in front RH ABS OUT valve.	
C1124	When a malfunction is detected in rear LH ABS IN valve.	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	
C1126	When a malfunction is detected in rear RH ABS IN valve.	
C1127	When a malfunction is detected in rear RH ABS OUT valve.	
C1130	When a malfunction is detected in ECM system.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

DTC	Malfunction detected condition	Fail-safe condition
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1142	When a malfunction is detected in pressure sensor.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function
C1143	When a malfunction is detected in steering angle sensor.	
C1144	When neutral position adjustment of steering angle sensor is not complete.	
C1145	When a malfunction is detected in yaw rate signal.	
C1146	When a malfunction is detected in side/decel G signal.	
C1155	When brake fluid level low signal is detected.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • hill start assist function
C1160	When calibration of yaw rate/side/decel G sensor is not complete.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function
C1164	When a malfunction is detected in cut valve 1.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1165	When a malfunction is detected in cut valve 2.	
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1197	When a malfunction is detected in vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.
C1198	<ul style="list-style-type: none"> • When an open circuit is detected in vacuum sensor circuit. • When a short circuit is detected in vacuum sensor circuit. • When a malfunction is detected in vacuum sensor noise. 	
C1199	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.	
C119A	When a malfunction is detected in supply power voltage of vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.
U1000	When CAN communication signal is not continuously received for 2 seconds or more.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function

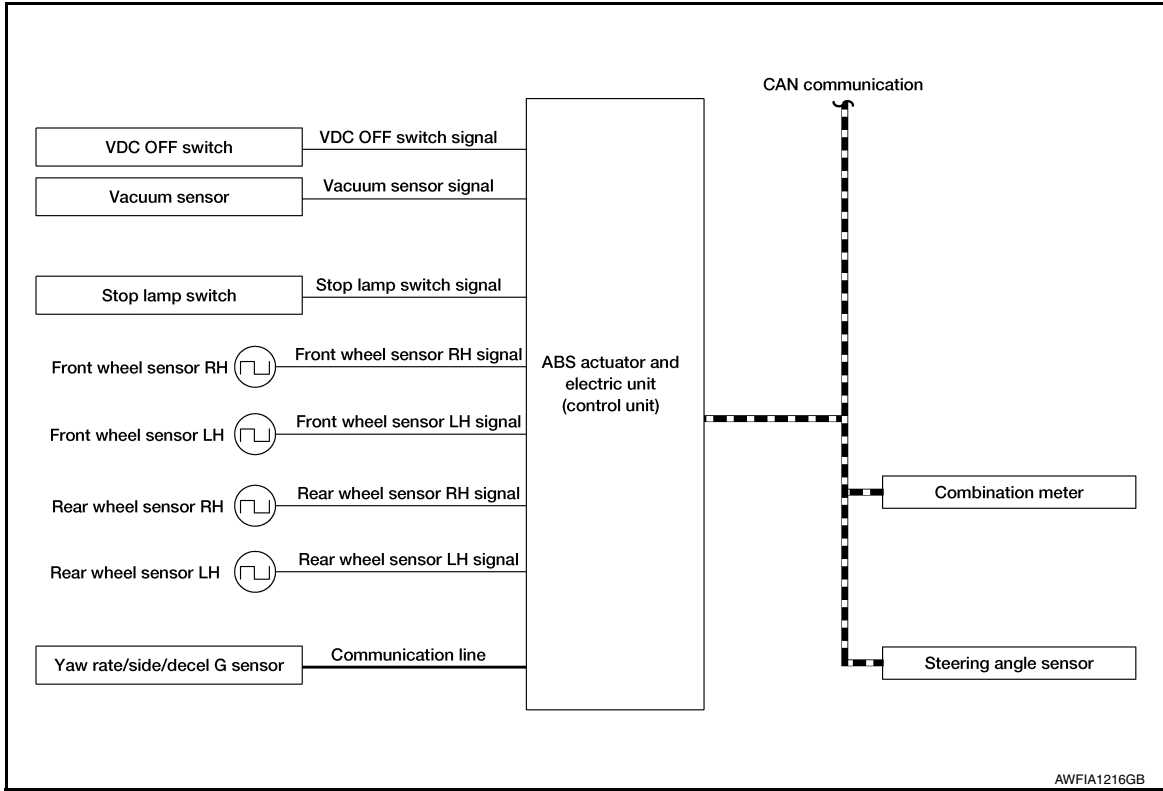
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BRC

VDC FUNCTION

VDC FUNCTION : System Diagram

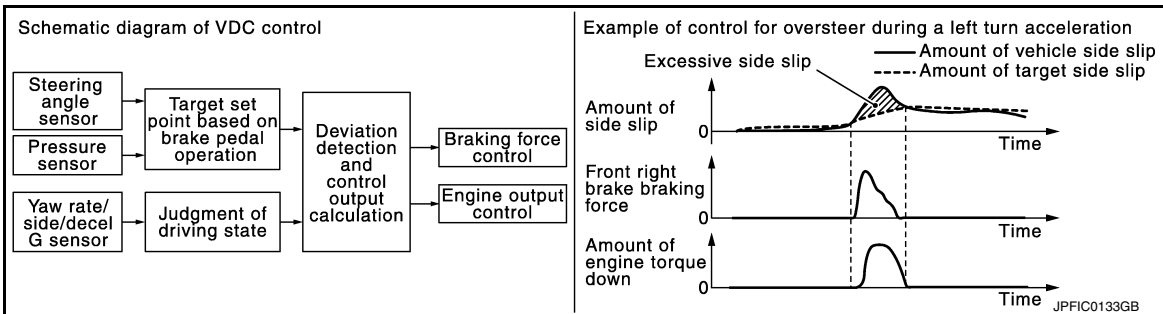
INFOID:000000012551812



VDC FUNCTION : System Description

INFOID:000000012551813

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



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

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

- switch.] VDC warning lamp turns ON when Brake limited slip differential (BLSD) function is in operation. Noises and vibration may be generated due to brake operation. This is not a malfunction.
- CONSULT can be used to diagnose the system.
 - Fail-safe function is adopted. When a malfunction occurs in VDC function, the control is suspended for VDC function, TCS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-23. "Fail-Safe"](#).

NOTE:

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

INPUT SIGNAL AND OUTPUT SIGNAL

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

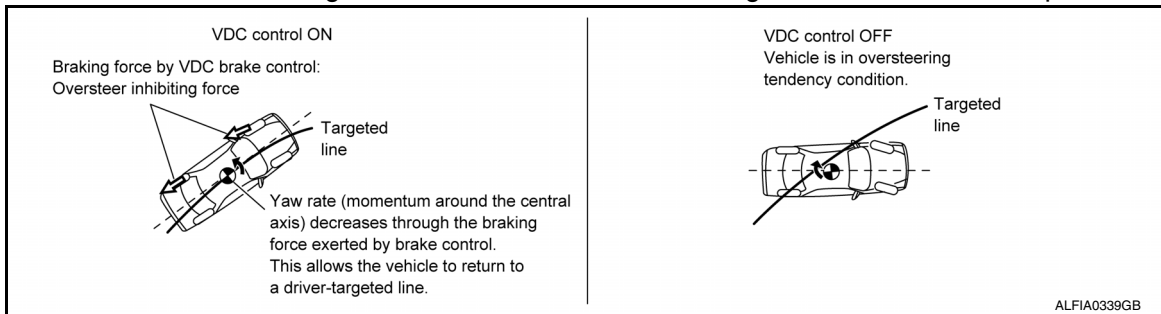
Component	Signal description
Yaw rate/side/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1: <ul style="list-style-type: none"> Yaw rate signal Side G sensor signal Decel G sensor signal
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> Acceleration pedal position signal Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> Target throttle position signal
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> Shift position signal
Steering angle sensor	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> Steering angle sensor signal
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> Brake fluid level switch signal Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> VDC warning lamp signal VDC OFF indicator lamp signal

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

OPERATION CHARACTERISTICS

VDC Function That Prevents Oversteer Tendency

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

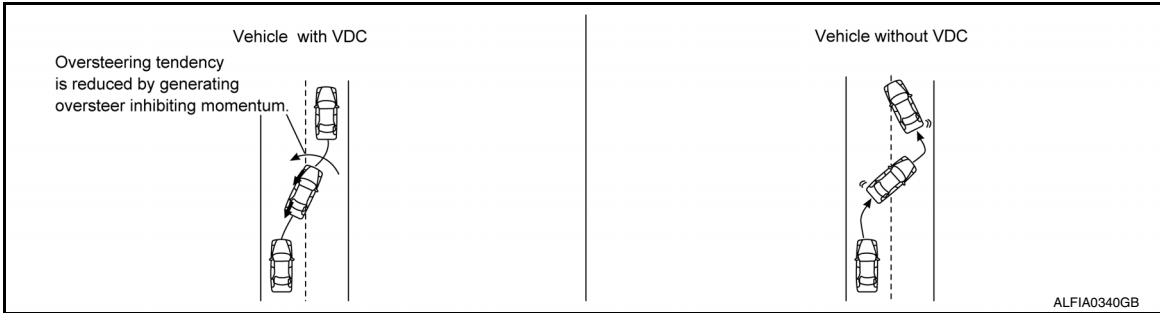


SYSTEM

< SYSTEM DESCRIPTION >

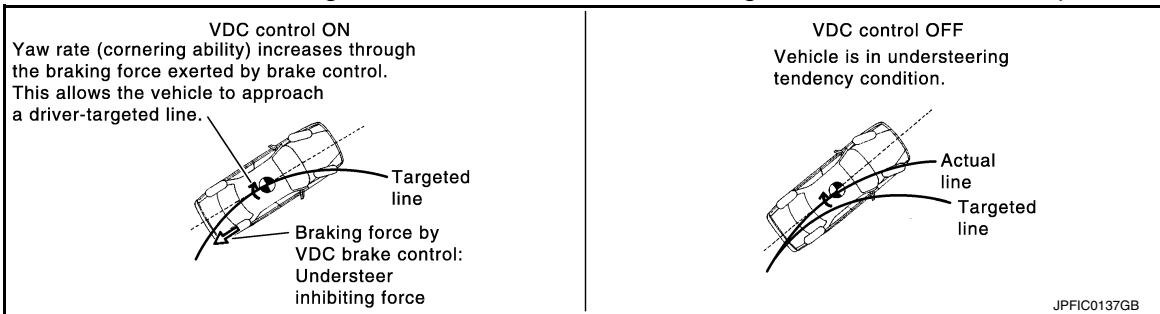
[TYPE 1]

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

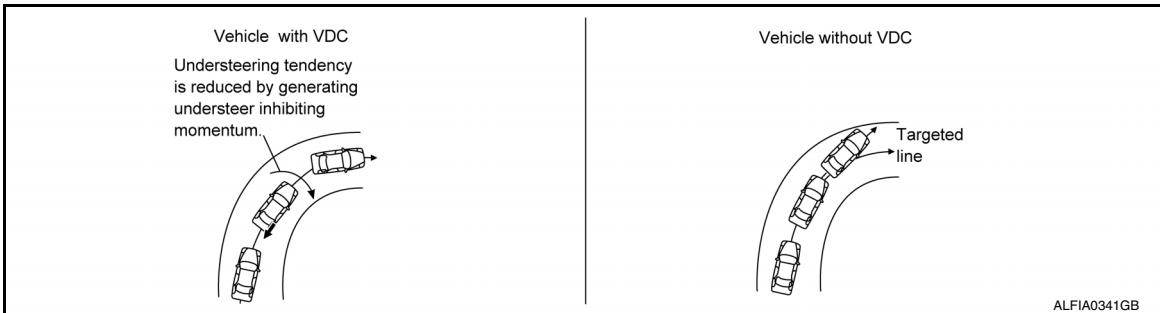


VDC Function That Prevents Understeer Tendency

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



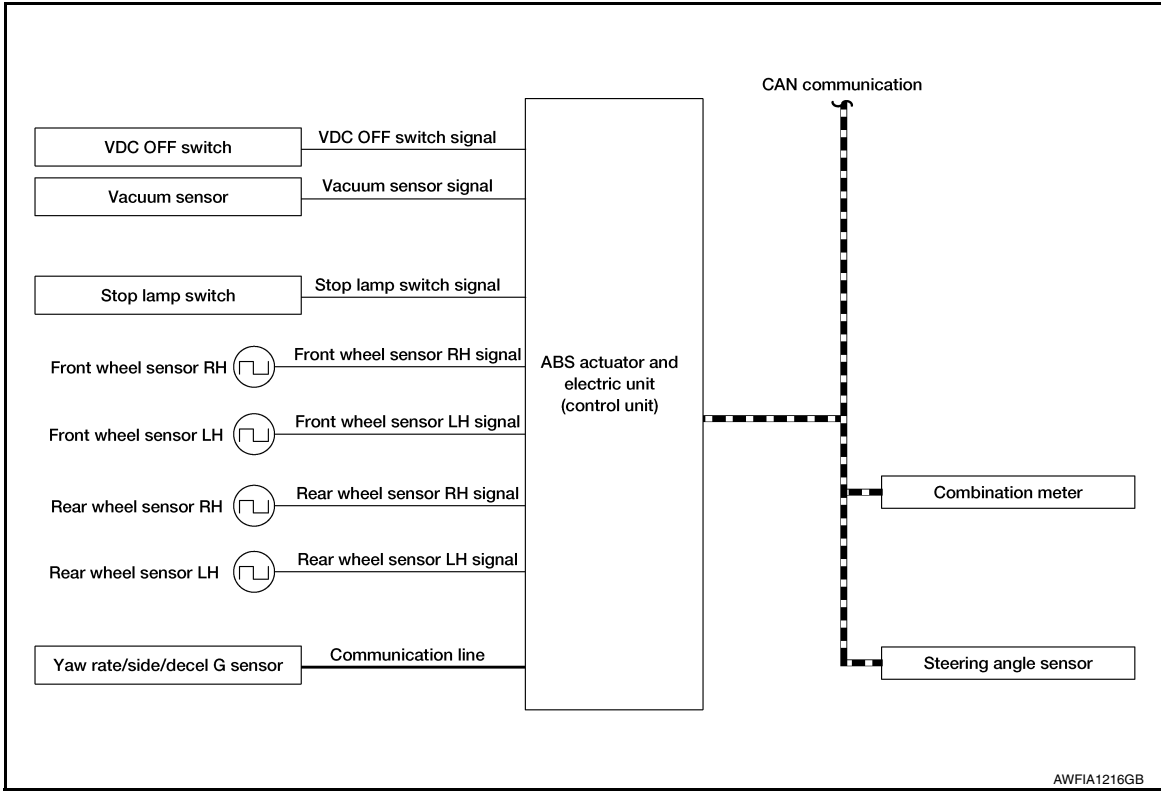
- Applying braking during cornering on a slippery road, when understeer tendency is judged large, engine output is controlled as well as brake force (brake fluid pressure) of four wheels. Understeer tendency decreases.



TCS FUNCTION

TCS FUNCTION : System Diagram

INFOID:000000012551814



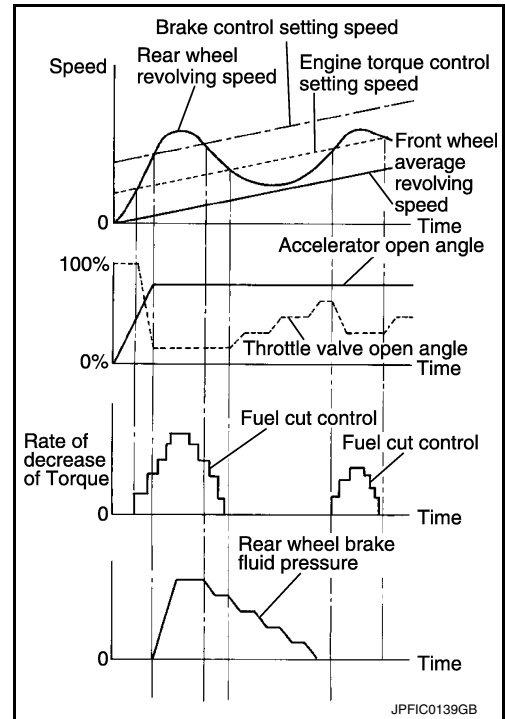
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TCS FUNCTION : System Description

INFOID:000000012551815

- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Engine output and transmission shift status is controlled so that slip rate of drive wheels is at an appropriate level. When wheel spin occurs on drive wheel, ABS actuator and electric unit (control unit) perform brake force control of LH and RH drive wheels (apply brake force by increasing brake fluid pressure of drive wheel) and decrease engine torque by engine torque control. Wheel spin amount decreases. Engine torque is controlled to appropriate level.
- TCS function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- VDC warning lamp blinks while TCS function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for VDC function, TCS function, and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-23, "Fail-Safe"](#).



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INPUT SIGNAL AND OUTPUT SIGNAL

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

SYSTEM

< SYSTEM DESCRIPTION >

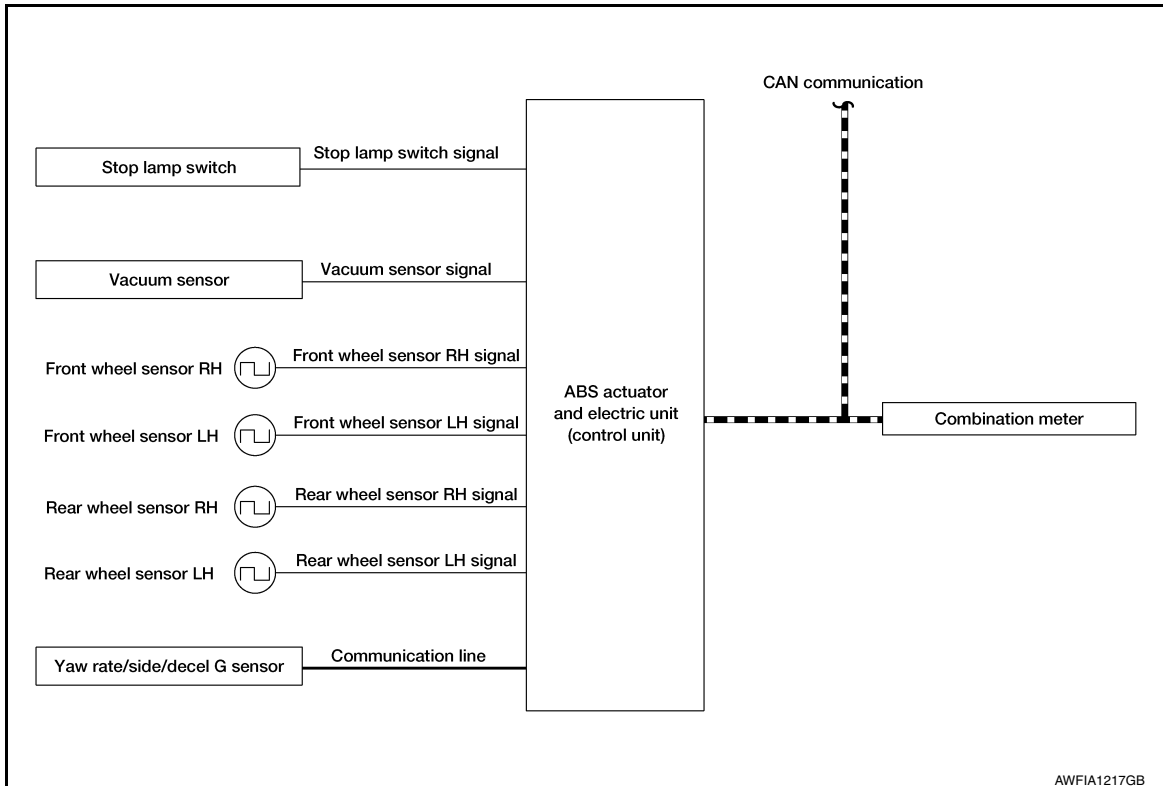
[TYPE 1]

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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Target throttle position signal
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Shift position signal
Steering angle sensor	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal

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

ABS FUNCTION : System Diagram

INFOID:000000012551816



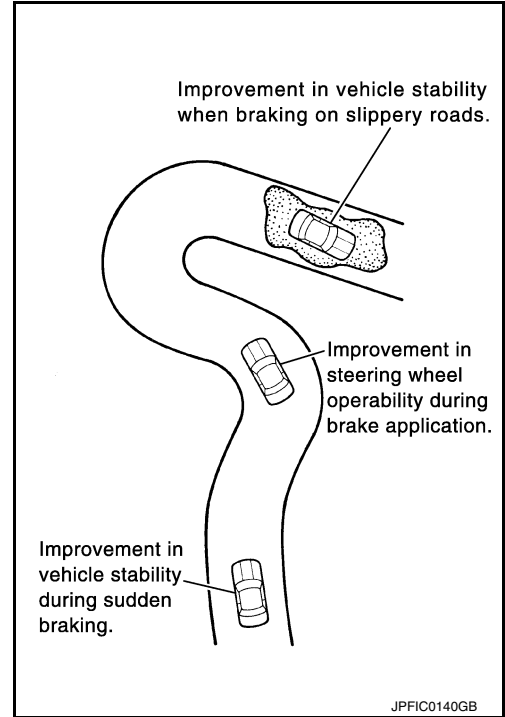
ABS FUNCTION : System Description

INFOID:000000012551817

- By preventing wheel lock through brake force (brake fluid pressure) control that is electronically controlled by detecting wheel speed during braking, stability during emergency braking is improved so that obstacles can be avoided by steering operation.
- During braking, control unit calculates wheel speed and pseudo-vehicle speed, and transmits pressure increase, hold or decrease signals to actuator portion according to wheel slip status.
- The following effects are obtained by preventing wheel lock during braking.
 - Vehicle tail slip is prevented during braking when driving straight.
 - Understeer and oversteer tendencies are moderated during braking driving on a corner.
 - Obstacles may be easily bypassed by steering operation during braking.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for VDC function, TCS function, ABS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and hill start assist function. However, EBD function is operated normally. Refer to [BRC-23. "Fail-Safe"](#).

NOTE:

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



INPUT SIGNAL AND OUTPUT SIGNAL

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

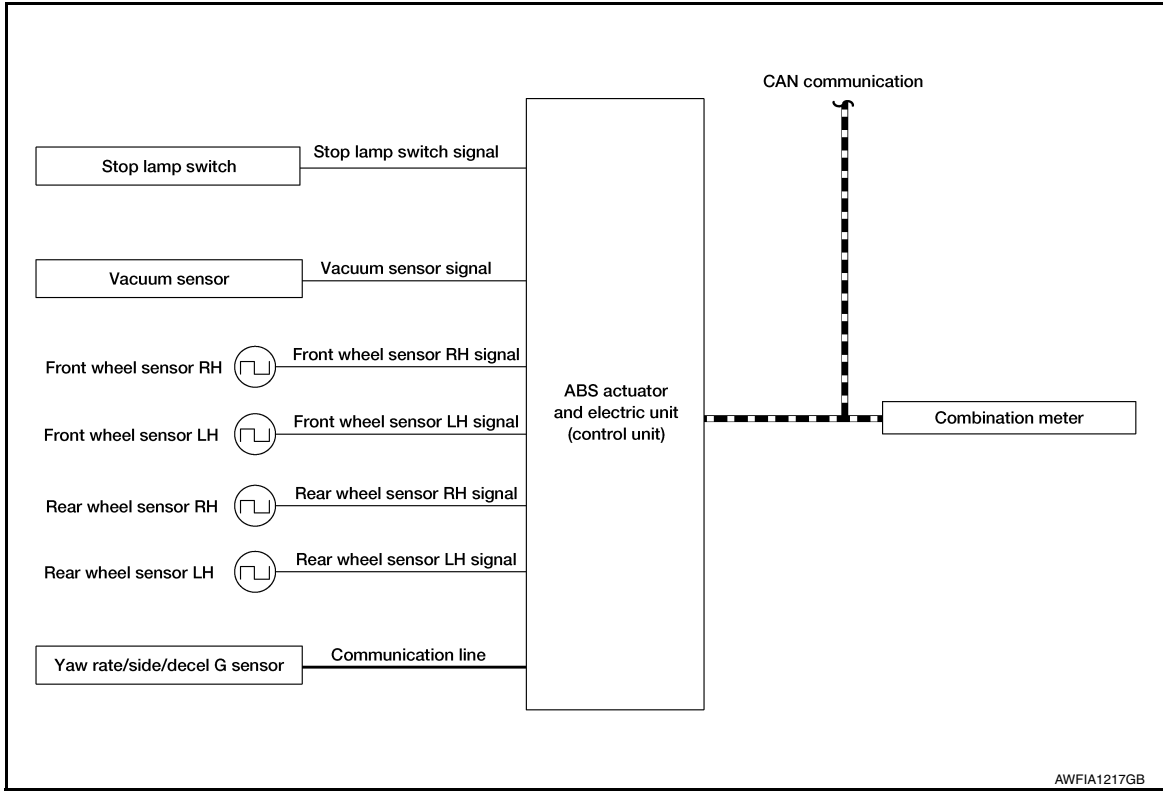
Component	Signal description
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • ABS warning lamp signal • VDC warning lamp signal

EBD FUNCTION

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EBD FUNCTION : System Diagram

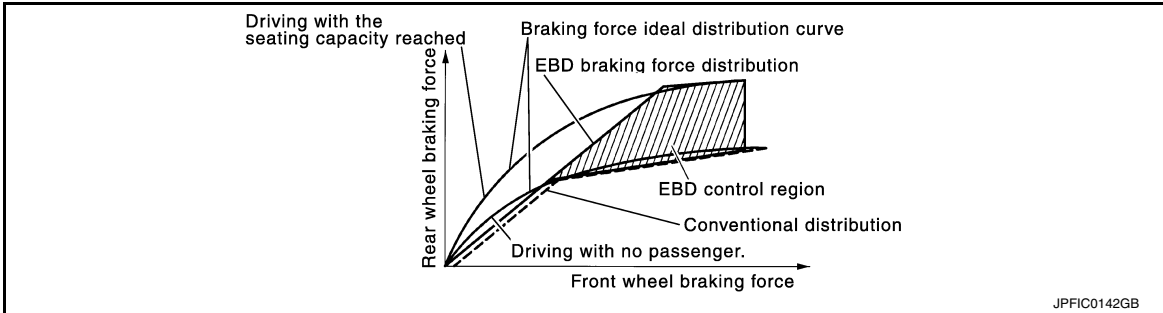
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EBD FUNCTION : System Description

INFOID:000000012551819

- 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).

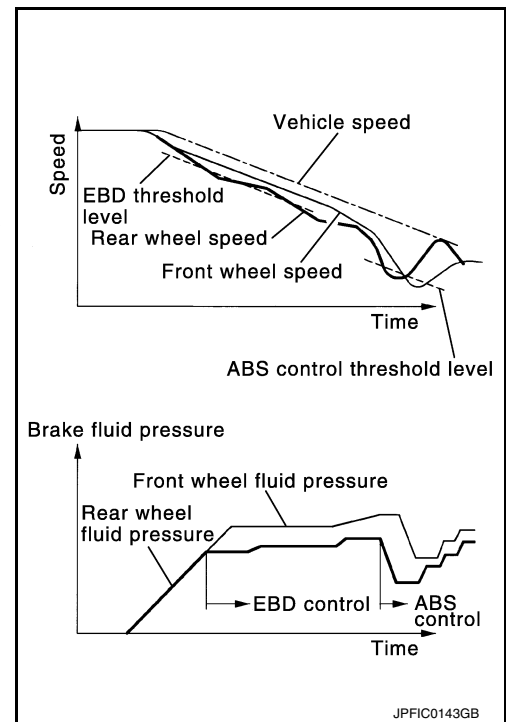


SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

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



INPUT SIGNAL AND OUTPUT SIGNAL

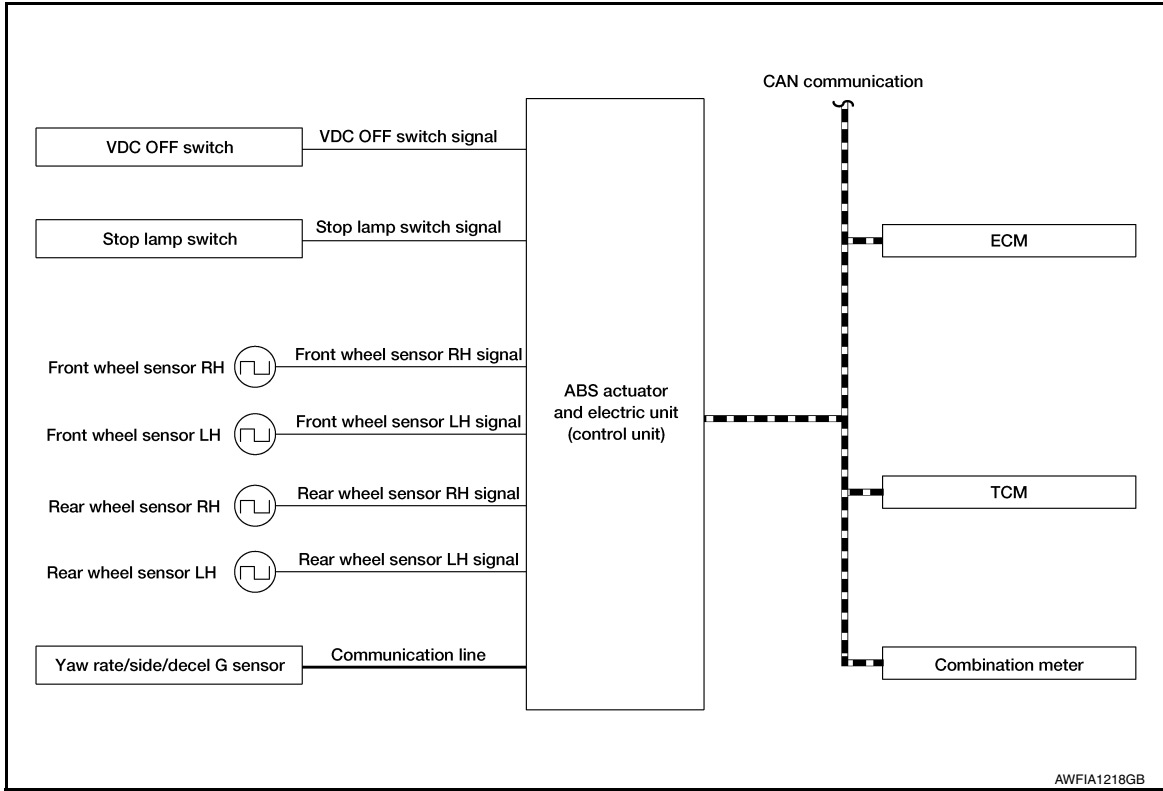
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake warning lamp signal • ABS warning lamp signal • VDC warning lamp signal

Hill start assist FUNCTION

Hill start assist FUNCTION : System Diagram

INFOID:000000012551820



Hill start assist FUNCTION : System Description

INFOID:000000012551821

- This function maintains brake fluid pressure so that the vehicle does not move backwards, even if brake pedal is released to depress accelerator pedal to start the vehicle, while it is stopped on an uphill slope by depressing brake pedal.
- This function operates when the vehicle is in stop status on an uphill slope of slope ratio 10% or more and selector lever is in any position other than P (Park) or N (Neutral).
- Hill start assist function is only for the start aid. It maintains the brake fluid pressure for approx. 2 seconds after releasing the brake pedal, and then decreases the pressure gradually. If the vehicle starts by accelerator operation, the brake is released automatically and a smooth start is performed.
- Fail-safe function is adopted. When a malfunction occurs in hill start assist function, the control is suspended for VDC function, TCS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-23, "Fail-Safe"](#).

INPUT SIGNAL AND OUTPUT SIGNAL

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

Component	Signal description
Yaw rate/side/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line *: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Target throttle position signal

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 1]

Component	Signal description	
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Shift position signal 	A
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal 	B C D

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

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

< SYSTEM DESCRIPTION >

[TYPE 1]

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

CONSULT Function

INFOID:000000012551822

CAUTION:

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

APPLICATION ITEMS

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

Mode	Function description
ECU Identification	Parts number of ABS actuator and electric unit (control unit) can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the ABS actuator and electric unit (control unit) can be read.
Active Test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.
Work support	Components can be quickly and accurately adjusted.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

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

SELF DIAGNOSTIC RESULT

Refer to [BRC-47, "DTC Index"](#).

When "CRNT" is displayed on self-diagnosis result,

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result,

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

Freeze frame data (FFD)

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

Item name	Display item
IGN counter (0 – 39)	<p>The number of times that ignition switch is turned ON after the DTC is detected is displayed.</p> <ul style="list-style-type: none">• 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. <p>NOTE: Each time when ignition switch is turned OFF to ON, numerical number increases in 1 → 2 → 3...38 → 39. When the operation number of times exceeds 39, the number do not increase and "39" is displayed until self-diagnosis is erased.</p>

ACTIVE TEST

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

CAUTION:

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

NOTE:

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

< SYSTEM DESCRIPTION >

[TYPE 1]

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

ABS IN Valve and ABS OUT Valve

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

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

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

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

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

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

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

ABS MOTOR

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

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

< SYSTEM DESCRIPTION >

[TYPE 1]

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

NOTE:

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

DATA MONITOR

×: Applicable

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

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

< SYSTEM DESCRIPTION >

[TYPE 1]

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

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

< SYSTEM DESCRIPTION >

[TYPE 1]

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

Note 1: Refer to [BRC-15. "System Description"](#) for ON/OFF conditions of each warning lamp and indicator lamp.

Note 2: USS means "hill start assist."

WORK SUPPORT

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

APPLICATION NOTICE

< ECU DIAGNOSIS INFORMATION >

[TYPE 1]

ECU DIAGNOSIS INFORMATION

APPLICATION NOTICE

Application Notice

INFOID:0000000012551823

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

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 1]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000012551824

CONSULT DATA MONITOR STANDARD VALUE

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

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 1]

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

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 1]

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

Note 1: Confirm tire pressure is standard value.

Note 2: Refer to [BRC-15, "System Description"](#) for ON/OFF conditions of each warning lamp and indicator lamp.

Note 3: USS means "hill start assist."

Fail-Safe

INFOID:000000012551825

VDC FUNCTION, TCS FUNCTION AND HILL START ASSIST FUNCTION

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

ABS FUNCTION

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

NOTE:

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

EBD FUNCTION

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

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 1]

DTC	Malfunction detected condition	Fail-safe condition	A	
C1101	When an open circuit is detected in rear RH wheel sensor circuit.	The following functions are suspended: • VDC function • TCS function • ABS function • EBD function (only when both 2 rear wheels are malfunctioning) • hill start assist function	A	
C1102	When an open circuit is detected in rear LH wheel sensor circuit.		B	
C1103	When an open circuit is detected in front RH wheel sensor circuit.		C	
C1104	When an open circuit is detected in front LH wheel sensor circuit.		D	
C1105	<ul style="list-style-type: none"> • When power supply voltage of rear RH wheel sensor is low. • When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. • When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. 		E	
C1106	<ul style="list-style-type: none"> • When power supply voltage of rear LH wheel sensor is low. • When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. • When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. 		BRC	
C1107	<ul style="list-style-type: none"> • When power supply voltage of front RH wheel sensor is low. • When distance between front RH wheel sensor and front RH wheel sensor rotor is large. • When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. 		G	
C1108	<ul style="list-style-type: none"> • When power supply voltage of front LH wheel sensor is low. • When distance between front LH wheel sensor and front LH wheel sensor rotor is large. • When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. 		H	
C1109	<ul style="list-style-type: none"> • When ignition voltage is 10 V or less. • When ignition voltage is 16 V or more. 		I	
C1111	When a malfunction is detected in motor or motor relay.		J	
C1115	When difference in wheel speed between any wheel and others is detected during the vehicle is driven because of installation of other tires than specified.		K	
C1116	When stop lamp switch signal is not input when brake pedal operates.		L	
C1120	When a malfunction is detected in front LH ABS IN valve.		The following functions are suspended: • VDC function • TCS function • ABS function • EBD function • hill start assist function	M
C1121	When a malfunction is detected in front LH ABS OUT valve.			N
C1122	When a malfunction is detected in front RH ABS IN valve.	O		
C1123	When a malfunction is detected in front RH ABS OUT valve.	P		
C1124	When a malfunction is detected in rear LH ABS IN valve.			
C1125	When a malfunction is detected in rear LH ABS OUT valve.			
C1126	When a malfunction is detected in rear RH ABS IN valve.			
C1127	When a malfunction is detected in rear RH ABS OUT valve.			
C1130	When a malfunction is detected in ECM system.	The following functions are suspended: • VDC function • TCS function • hill start assist function	P	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 1]

DTC	Malfunction detected condition	Fail-safe condition
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1142	When a malfunction is detected in pressure sensor.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function
C1143	When a malfunction is detected in steering angle sensor.	
C1144	When neutral position adjustment of steering angle sensor is not complete.	
C1145	When a malfunction is detected in yaw rate signal.	
C1146	When a malfunction is detected in side/decel G signal.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • hill start assist function
C1155	When brake fluid level low signal is detected.	
C1160	When calibration of yaw rate/side/decel G sensor is not complete.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function
C1164	When a malfunction is detected in cut valve 1.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1165	When a malfunction is detected in cut valve 2.	
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	Electrical vacuum assistance of brake booster is suspended.
C1197	When a malfunction is detected in vacuum sensor.	
C1198	<ul style="list-style-type: none"> • When an open circuit is detected in vacuum sensor circuit. • When a short circuit is detected in vacuum sensor circuit. • When a malfunction is detected in vacuum sensor noise. 	—
C1199	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.	
C119A	When a malfunction is detected in supply power voltage of vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.
U1000	When CAN communication signal is not continuously received for 2 seconds or more.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function

DTC Inspection Priority Chart

INFOID:000000012551826

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

Priority	Detected item (DTC)
1	<ul style="list-style-type: none"> • U1000 CAN COMM CIRCUIT
2	<ul style="list-style-type: none"> • C1170 VARIANT CODING
3	<ul style="list-style-type: none"> • C1130 ENGINE SIGNAL 1 • C1144 ST ANG SEN SIGNAL
4	<ul style="list-style-type: none"> • C1109 BATTERY VOLTAGE [ABNORMAL] • C1111 PUMP MOTOR • C1140 ACTUATOR RLY

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 1]

Priority	Detected item (DTC)	
5	<ul style="list-style-type: none"> • C1101 RR RH SENSOR-1 • C1102 RR LH SENSOR-1 • C1103 FR RH SENSOR-1 • C1104 FR LH SENSOR-1 • C1105 RR RH SENSOR-2 • C1106 RR LH SENSOR-2 • C1107 FR RH SENSOR-2 • C1108 FR LH SENSOR-2 • C1115 ABS SENSOR [ABNORMAL SIGNAL] • C1116 STOP LAMP SW • C1120 FR LH IN ABS SOL • C1121 FR LH OUT ABS SOL • C1122 FR RH IN ABS SOL • C1123 FR RH OUT ABS SOL • C1124 RR LH IN ABS SOL • C1125 RR LH OUT ABS SOL • C1126 RR RH IN ABS SOL • C1127 RR RH OUT ABS SOL 	A B C D E
	<ul style="list-style-type: none"> • C1142 PRESS SEN CIRCUIT • C1143 ST ANG SEN CIRCUIT • C1145 YAW RATE SENSOR • C1146 SIDE G SEN CIRCUIT • C1160 DECEL G SEN SET • C1164 CV 1 • C1165 CV 2 • C1197 VACUUM SENSOR • C1198 VACUUM SEN CIR • C1199 BRAKE BOOSTER • C119A VACUUM SEN VOLT 	G H
	<ul style="list-style-type: none"> • C1155 BR FLUID LEVEL LOW 	I

BRC

DTC Index

INFOID:000000012551827

DTC	Display Item	Refer to
C1101	RR RH SENSOR-1	BRC-67, "DTC Description"
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	BRC-72, "DTC Description"
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNOMAL]	BRC-79, "DTC Description"
C1111	PUMP MOTOR	BRC-81, "DTC Description"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-84, "DTC Description"
C1116	STOP LAMP SW	BRC-91, "DTC Description"
C1120	FR LH IN ABS SOL	BRC-95, "DTC Description"
C1121	FR LH OUT ABS SOL	BRC-97, "DTC Description"
C1122	FR RH IN ABS SOL	BRC-95, "DTC Description"
C1123	FR RH OUT ABS SOL	BRC-97, "DTC Description"
C1124	RR LH IN ABS SOL	BRC-95, "DTC Description"
C1125	RR LH OUT ABS SOL	BRC-97, "DTC Description"
C1126	RR RH IN ABS SOL	BRC-95, "DTC Description"
C1127	RR RH OUT ABS SOL	BRC-97, "DTC Description"

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 1]

DTC	Display Item	Refer to
C1130	ENGINE SIGNAL 1	BRC-99, "DTC Description"
C1140	ACTUATOR RLY	BRC-101, "DTC Description"
C1142	PRESS SEN CIRCUIT	BRC-103, "DTC Description"
C1143	ST ANG SEN CIRCUIT	BRC-106, "DTC Description"
C1144	ST ANG SEN SIGNAL	BRC-110, "DTC Description"
C1145	YAW RATE SENSOR	BRC-112, "DTC Description"
C1146	SIDE G SEN CIRCUIT	
C1155	BR FLUID LEVEL LOW	BRC-115, "DTC Description"
C1160	DECEL G SEN SET	BRC-119, "DTC Description"
C1164	CV 1	BRC-121, "DTC Description"
C1165	CV 2	
C1170	VARIANT CODING	BRC-123, "DTC Description"
C1197	VACUUM SENSOR	BRC-124, "DTC Description"
C1198	VACUUM SEN CIR	BRC-127, "DTC Description"
C1199	BRAKE BOOSTER	BRC-129, "DTC Description"
C119A	VACUUM SEN VOLT	BRC-132, "DTC Description"
U1000	CAN COMM CIRCUIT	BRC-135, "DTC Description"

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[TYPE 1]

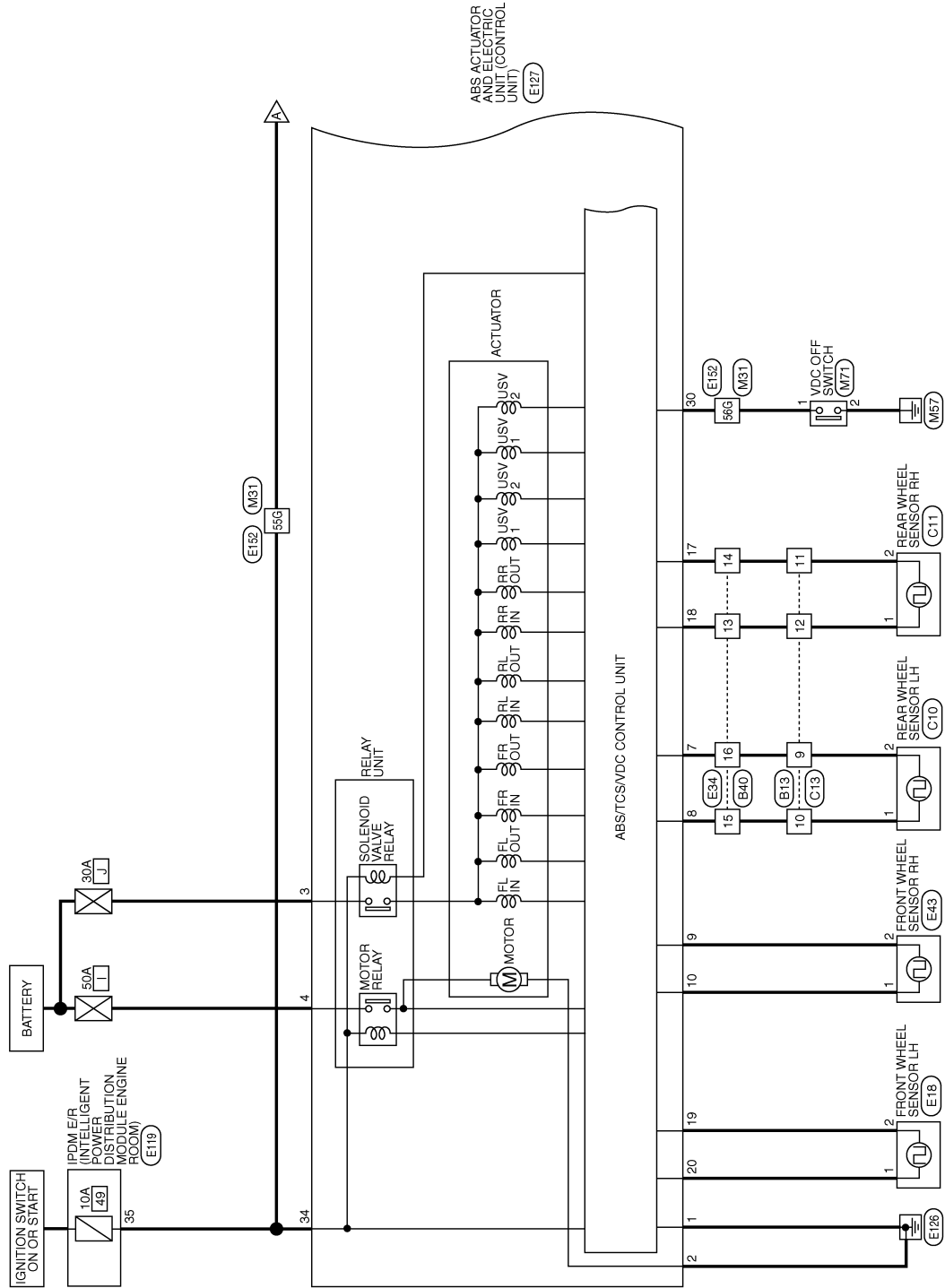
WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:0000000012551828

BRAKE CONTROL SYSTEM - VDC WITHOUT HILL DESCENT CONTROL

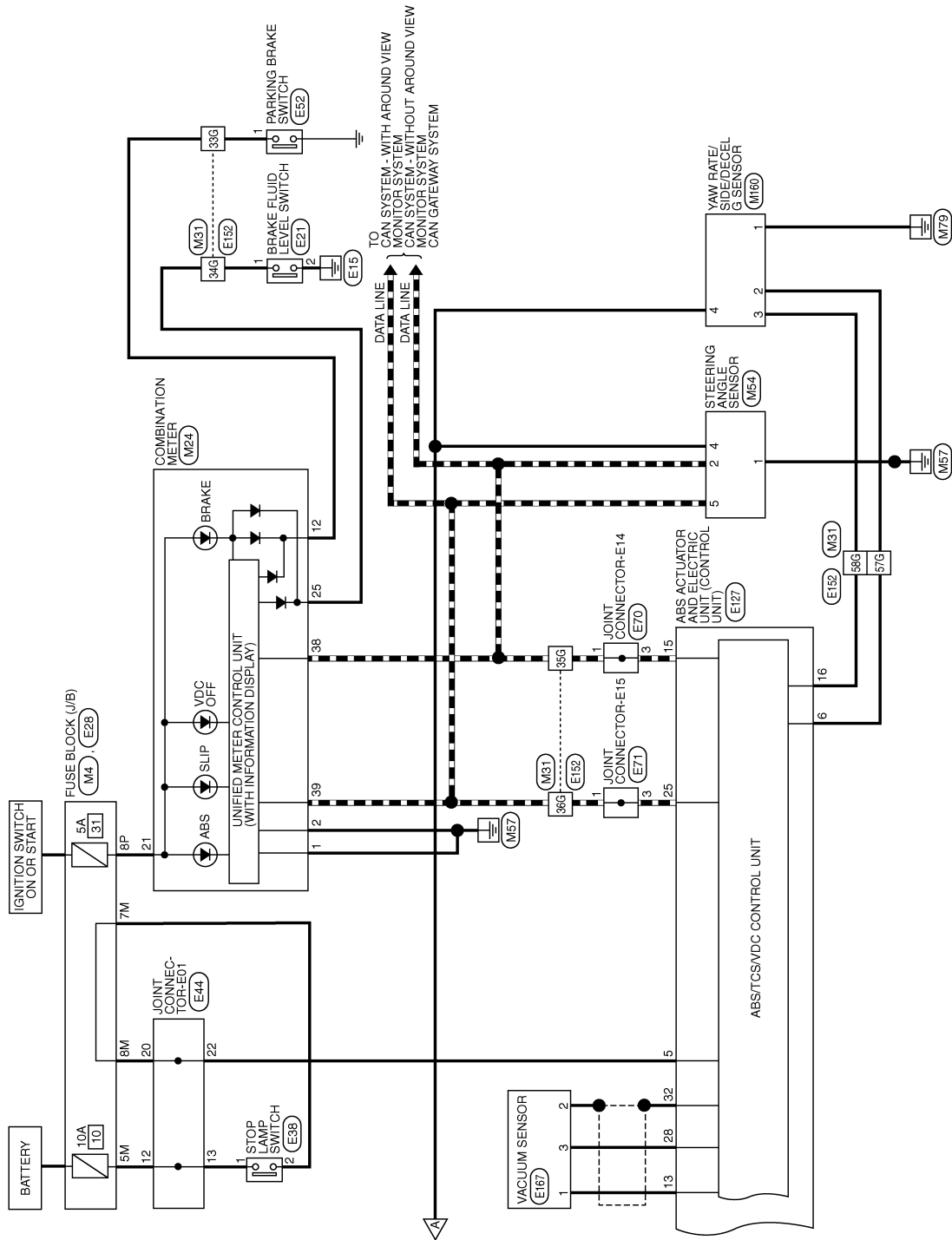


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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[TYPE 1]



ABFWA0513GB

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[TYPE 1]

BRAKE CONTROL SYSTEM CONNECTORS - VDC WITHOUT HILL DESCENT CONTROL

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



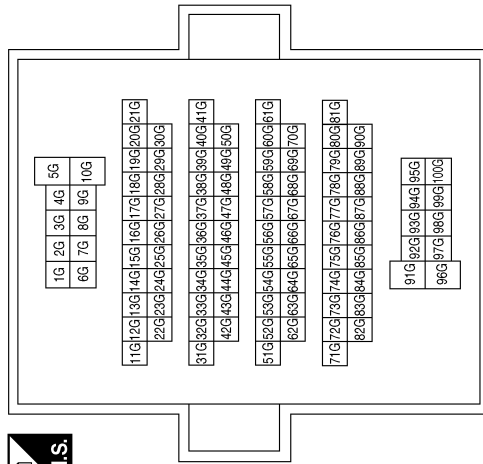
Terminal No.	Color of Wire	Signal Name
8P	BG	-

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	GND1
2	B	GND2
12	G	PKB
21	BG	IGN
25	G	BRAKE OIL SW
38	P	CAN-L
39	L	CAN-H

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
33G	G	-
34G	G	-
35G	P	-
36G	L	-
55G	G	-
56G	P	-
57G	P	-
58G	L	-

Connector No.	M54
Connector Name	STEERING ANGLE SENSOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	GR	GND
2	P	CAN-L
4	G	BAT
5	L	CAN-H

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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

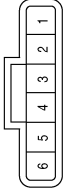
[TYPE 1]

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



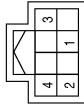
Terminal No.	Color of Wire	Signal Name
1	G	-
2	W	-

Connector No.	M160
Connector Name	YAW RATE/SIDE/DECEL G SENSOR
Connector Color	BLACK



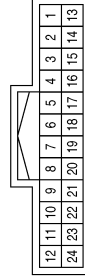
Terminal No.	Color of Wire	Signal Name
1	GR	-
2	P	-
3	L	-
4	G	-

Connector No.	M71
Connector Name	VDC OFF SWITCH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	P	-
2	GR	-

Connector No.	E34
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
13	BG	-
14	P	-
15	R	-
16	G	-

Connector No.	E28
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
5M	Y	-
7M	R	-
8M	R	-

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



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

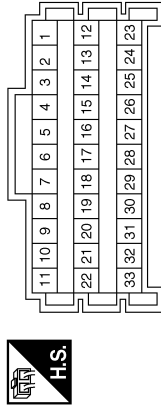
ABFIA0933GB

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[TYPE 1]

Connector No.	E44
Connector Name	JOINT CONNECTOR-E01
Connector Color	WHITE



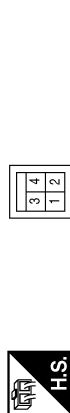
Terminal No.	Color of Wire	Signal Name
12	Y	-
13	Y	-
20	R	-
22	R	-

Connector No.	E43
Connector Name	FRONT WHEEL SENSOR RH
Connector Color	BLACK



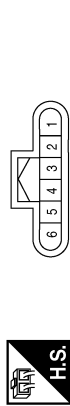
Terminal No.	Color of Wire	Signal Name
1	G	-
2	W	-

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



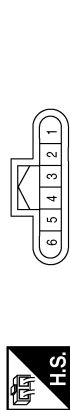
Terminal No.	Color of Wire	Signal Name
1	Y	-
2	R	-

Connector No.	E71
Connector Name	JOINT CONNECTOR-E15
Connector Color	BLACK



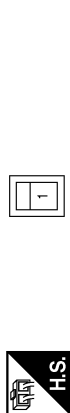
Terminal No.	Color of Wire	Signal Name
1	L	-
3	L	-

Connector No.	E70
Connector Name	JOINT CONNECTOR-E14
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	P	-
3	P	-

Connector No.	E52
Connector Name	PARKING BRAKE SWITCH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	LG	-

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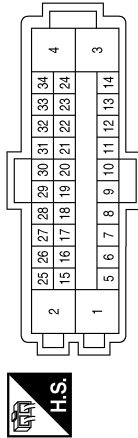
BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[TYPE 1]

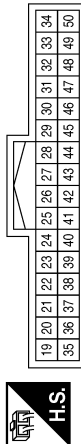
Terminal No.	Color of Wire	Signal Name
14	-	-
15	P	CAN-L
16	BG	CANM2 (+)
17	P	RR RH SEN (SIGNAL)
18	BG	RR RH SEN (POWER)
19	W	FR LH SEN (SIGNAL)
20	G	FR LH SEN (POWER)
21	-	-
22	-	-
23	-	-
24	-	-
25	L	CAN-H
26	-	-
27	-	-
28	B	VAC SEN (POWER)
29	-	-
30	R	VDC OFF SW
31	-	-
32	SHIELD	VAC SEN (GND)
33	-	-
34	BR	IGN (POWER)

Connector No.	E127
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (WITHOUT 4WD SYSTEM)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	B	ECU (GND)
2	B/W	MOTOR (GND)
3	R	SOLENOID (POWER)
4	W	MOTOR (POWER)
5	R	STOP LAMP SW
6	P	CANM2 (-)
7	G	RR LH SEN (SIGNAL)
8	R	RR LH SEN (POWER)
9	W	FR RH SEN (SIGNAL)
10	G	FR RH SEN (POWER)
11	-	-
12	-	-
13	W	VAC SEN (SIGNAL)

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



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

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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[TYPE 1]

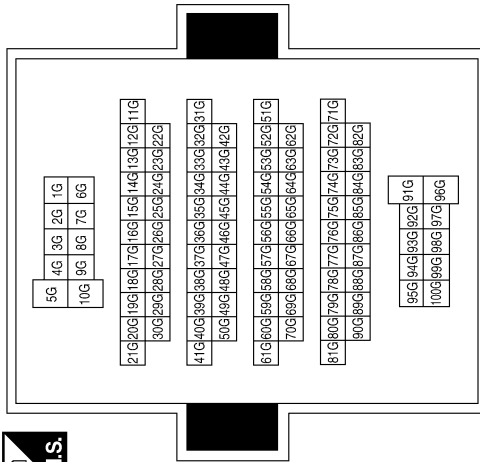
Connector No.	E167
Connector Name	VACUUM SENSOR
Connector Color	BLACK



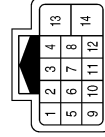
Terminal No.	Color of Wire	Signal Name
1	W	-
2	SHIELD	-
3	B	-

Terminal No.	Color of Wire	Signal Name
33G	LG	-
34G	W	-
35G	P	-
36G	L	-
55G	BR	-
56G	R	-
57G	P	-
58G	BG	-

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Connector No.	C13
Connector Name	WIRE TO WIRE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
9	W	-
10	B	-
11	P	-
12	V	-

Connector No.	C11
Connector Name	REAR WHEEL SENSOR RH
Connector Color	GRAY



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

Connector No.	C10
Connector Name	REAR WHEEL SENSOR LH
Connector Color	BLACK



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

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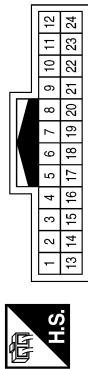
BRC

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

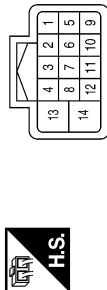
[TYPE 1]

Connector No.	B40
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
13	L	-
14	P	-
15	BR	-
16	Y	-

Connector No.	B13
Connector Name	WIRE TO WIRE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
9	Y	-
10	BR	-
11	P	-
12	L	-

AAFIA0142GB

APPLICATION NOTICE

< BASIC INSPECTION >

[TYPE 1]

BASIC INSPECTION

APPLICATION NOTICE

Application Notice

INFOID:0000000012551829

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

A

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D

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BRC

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P

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TYPE 1]

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000012551830

DETAILED FLOW

1. INTERVIEW THE CUSTOMER

Clarify customer concerns before inspection. First of all, perform an interview utilizing [BRC-59, "Diagnostic Work Sheet"](#) and reproduce the symptom as well as fully understand it. Ask customer about his/her concerns carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

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

>> GO TO 2.

2. CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained in the interview. Also check that the symptom is not caused by fail-safe mode. Refer to [BRC-44, "Fail-Safe"](#).

CAUTION:

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

>> GO TO 3.

3. PERFORM THE SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

Be sure to wait of 10 seconds after turning ignition switch OFF or ON.

2. Perform "Self Diagnostic Result" of "ABS".

Is DTC detected?

YES >> Record or print Self Diagnostic Results and Freeze Frame Data (FFD). GO TO 4.

NO >> GO TO 6.

4. RECHECK THE SYMPTOM

Ⓟ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS".
2. Turn the ignition switch OFF → ON → OFF.

CAUTION:

Be sure to wait of 10 seconds after turning ignition switch OFF or ON.

3. Perform DTC confirmation procedures for the malfunctioning system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [BRC-46, "DTC Inspection Priority Chart"](#).

Is DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained in the interview. Refer to [GI-47, "Intermittent Incident"](#).

5. REPAIR OR REPLACE MALFUNCTIONING COMPONENT

1. Repair or replace malfunctioning components.
2. Reconnect component or connector after repairing or replacing.
3. When DTC is detected, erase "Self Diagnostic Result" of "ABS".

CAUTION:

- Turn the ignition switch OFF → ON → OFF after erasing Self Diagnostic Result.
- Be sure to wait of 10 seconds after turning ignition switch OFF or ON.

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TYPE 1]

>> GO TO 7.

6. IDENTIFY MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Identify malfunctioning system based on symptom diagnosis and perform inspection.

Can the malfunctioning system be identified?

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained in the interview. Refer to [GI-47. "Intermittent Incident"](#).

7. FINAL CHECK

 With CONSULT

1. Select "DATA MONITOR" of "ABS"
2. Check the reference values. Refer to [BRC-42. "Reference Value"](#).
3. 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:000000012551831

DESCRIPTION

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

INTERVIEW SHEET SAMPLE

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

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TYPE 1]

Interview sheet

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

Memo

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

< BASIC INSPECTION >

[TYPE 1]

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

Description

INFOID:0000000012551832

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

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

Work Procedure

INFOID:0000000012551833

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to [BRC-62. "Work Procedure"](#), GO TO 2.

2. PERFORM CALIBRATION OF THE DECEL G SENSOR

Perform calibration of the decel G sensor.

>> Refer to [BRC-64. "Work Procedure"](#).

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ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[TYPE 1]

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:000000012551834

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

×: Required –: Not required

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

Work Procedure

INFOID:000000012551835

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

CAUTION:

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

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

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

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

CAUTION:

Do not touch steering wheel while adjusting steering angle sensor.

3. After approximately 10 seconds, touch "END".

NOTE:

After approximately 60 seconds, it ends automatically.

4. Turn ignition switch OFF, then turn it ON again.

CAUTION:

Be sure to perform above operation.

>> GO TO 3.

3. CHECK DATA MONITOR

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

Is the steering angle within the specified range?

YES >> GO TO 4.

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

4. ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to [BRC-36, "CONSULT Function"](#).

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[TYPE 1]

- ECM: Refer to [EC-71. "CONSULT Function"](#) (USA and Canada) or [EC-563. "CONSULT Function"](#) (Mexico).

Are the memories erased?

YES >> Inspection End.

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

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CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

[TYPE 1]

CALIBRATION OF DECEL G SENSOR

Description

INFOID:000000012551836

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

×: Required —: Not required

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

Work Procedure

INFOID:000000012551837

CALIBRATION OF DECEL G SENSOR

CAUTION:

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

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

2. PERFORM CALIBRATION OF DECEL G SENSOR

1. On the CONSULT screen, touch "WORK SUPPORT" and "DECEL G SEN CALIBRATION" in order.
2. Touch "START".
3. After approximately 10 seconds, touch "END".

NOTE:

After approximately 60 seconds, it ends automatically.

4. Turn ignition switch OFF, then turn it ON again.

CAUTION:

Be sure to perform above operation.

>> GO TO 3.

3. CHECK DATA MONITOR

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

Is the inspection result normal?

YES >> GO TO 4.

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

4. ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to [BRC-36, "CONSULT Function"](#).
- ECM: Refer to [EC-71, "CONSULT Function"](#) (USA and Canada) or [EC-563, "CONSULT Function"](#) (Mexico).

CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

[TYPE 1]

Are the memories erased?

YES >> Inspection End.

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

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APPLICATION NOTICE

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

DTC/CIRCUIT DIAGNOSIS

APPLICATION NOTICE

Application Notice

INFOID:0000000012551838

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Description

INFOID:000000012551839

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • Wheel sensor • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • Vehicle was not driven after previous repair

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1101", "C1102", "C1103" or "C1104" is displayed as "CRNT": Proceed to [BRC-68, "Diagnosis Procedure"](#).

YES-2 >> "C1101", "C1102", "C1103" or "C1104" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551840

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK WHEEL SENSOR

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

Is the inspection result normal?

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

2. REPLACE WHEEL SENSOR (1)

Ⓟ With CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-155, "Removal and Installation - Front Wheel Sensor"](#).
 - Rear: Refer to [BRC-157, "Removal and Installation - Rear Wheel Sensor"](#).
2. Erase "Self Diagnostic Result" of "ABS".
3. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
6. Stop the vehicle.
7. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
8. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
9. Perform "Self Diagnostic Result" of "ABS".

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

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

3. CHECK CONNECTOR

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

Is the inspection result normal?

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

4. PERFORM SELF-DIAGNOSIS (1)

Ⓟ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS".
2. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
5. Stop the vehicle.
6. Turn the ignition switch OFF.
NOTE:

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

Wait at least 10 seconds after turning ignition switch OFF.

7. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

8. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 5.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136](#), "[Diagnosis Procedure](#)".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, fuse, or fusible link.

6. CHECK TERMINAL


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

Is the inspection result normal?

YES >> GO TO 8.

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

7. PERFORM SELF-DIAGNOSIS (2)

 With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

7. Stop the vehicle.
8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

10. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 8.

NO >> Inspection End.

8. CHECK WHEEL SENSOR HARNESS

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

Power Supply Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E127	20	E18	(Front LH wheel)	1
	10	E43	(Front RH wheel)	
	8	C10	(Rear LH wheel)	
	18	C11	(Rear RH wheel)	

Signal Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E127	19	E18	(Front LH wheel)	2
	9	E43	(Front RH wheel)	
	7	C10	(Rear LH wheel)	
	17	C11	(Rear RH wheel)	

Is the inspection result normal?

YES >> GO TO 10.

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

9. PERFORM SELF-DIAGNOSIS (3)

With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

7. Stop the vehicle.
8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

10. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 10.

NO >> Inspection End.

10. CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >


[TYPE 1]

Does the ABS active wheel sensor tester detect a signal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> GO TO 11.

11. REPLACE WHEEL SENSOR

 With CONSULT

1. Replace the wheel sensor.

- Front: Refer to [BRC-155, "Removal and Installation - Front Wheel Sensor"](#).

- Rear: Refer to [BRC-157, "Removal and Installation - Rear Wheel Sensor"](#).

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

3. Erase "Self Diagnostic Result" of "ABS".

4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.

6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

7. Stop the vehicle.

8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

10. Perform "Self Diagnostic Result" of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Inspection End.

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C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Description

INFOID:000000012551841

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1105	RR RH SENSOR-2 (Rear RH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of rear RH wheel sensor is low. When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. When there is contamination on or damage to the rear RH wheel sensor or rear RH sensor rotor.
C1106	RR LH SENSOR-2 (Rear LH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of rear LH wheel sensor is low. When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. When there is contamination on or damage to the rear LH wheel sensor or rear LH sensor rotor.
C1107	FR RH SENSOR-2 (Front RH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of front RH wheel sensor is low. When distance between front RH wheel sensor and front RH wheel sensor rotor is large. When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. When there is contamination on or damage to the front RH wheel sensor or front RH sensor rotor.
C1108	FR LH SENSOR-2 (Front LH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of front LH wheel sensor is low. When distance between front LH wheel sensor and front LH wheel sensor rotor is large. When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. When there is contamination on or damage to the front LH wheel sensor or front LH sensor rotor.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> Harness or connector Wheel sensor Sensor rotor Tire size ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	<ul style="list-style-type: none"> Harness or connector Wheel sensor Sensor rotor ABS actuator and electric unit (control unit) Tire size ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Vehicle was not driven after previous repair

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

- Start the engine.
- Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
- Stop the vehicle.
- Turn the ignition switch OFF.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1105", "C1106", "C1107" or "C1108" is displayed as "CRNT": Proceed to [BRC-73, "Diagnosis Procedure"](#).

YES-2 >> "C1105", "C1106", "C1107" or "C1108" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551842

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK WHEEL HUB ASSEMBLY

Check that there is no excessive looseness in wheel hub assembly.

- Front: Refer to [FAX-6, "Inspection"](#).
- Rear: Refer to [RAX-5, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

- NO >> Repair or replace the wheel hub assembly, and GO TO 2.
- Front: Refer to [FAX-8, "Removal and Installation"](#).
 - Rear: Refer to [RAX-7, "Removal and Installation"](#).

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

- NO >> Repair / replace harness, connector, fuse, or fusible link.

3. CHECK TIRE


1. Turn the ignition switch OFF.
2. Check the tire air pressure, wear and size. Refer to [WT-67, "Tire Air Pressure"](#).

Is the inspection result normal?

YES >> GO TO 6.

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

4. CHECK DATA MONITOR (1)

 With CONSULT

1. Erase "Self Diagnostic Result" of "ABS".
2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.
4. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

C1105, C1106, C1107, C1108 WHEEL SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

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

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

5.PERFORM SELF-DIAGNOSIS (1)

ⓅWith CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after start the engine.
4. Perform "Self Diagnostic Result" of "ABS".

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

- YES >> GO TO 6.
- NO >> Inspection End.

6.CHECK WHEEL SENSOR AND SENSOR ROTOR

1. Turn the ignition switch OFF.
2. Disconnect wheel sensor harness connector.
3. Remove dust and foreign matter adhered to the wheel sensor and sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.

CAUTION:

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

- Front: Refer to [BRC-155, "Exploded View - Front Wheel Sensor"](#).
- Rear: Refer to [BRC-156, "Exploded View - Rear Wheel Sensor"](#).

>> GO TO 7.

7.CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

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

8.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

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

9.REPLACE WHEEL SENSOR (1)

ⓅWith CONSULT

1. Replace the wheel sensor.
- Front: Refer to [BRC-155, "Removal and Installation - Front Wheel Sensor"](#).

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

1. Rear: Refer to [BRC-157, "Removal and Installation - Rear Wheel Sensor"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 10.

NO >> GO TO 20.

10. PERFORM SELF-DIAGNOSIS (2)

Ⓜ With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

4. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 11.

NO >> Inspection End.

11. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 14.

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

12. CHECK DATA MONITOR (2)

Ⓜ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS".
2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

4. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

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

13.PERFORM SELF-DIAGNOSIS (3)

ⓅWith CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after start the engine.
4. Perform "Self Diagnostic Result" of "ABS".

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

- YES >> GO TO 14.
NO >> Inspection End.

14.CHECK TERMINAL

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

Is the inspection result normal?

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

15.CHECK DATA MONITOR (3)

ⓅWith CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

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

16.PERFORM SELF-DIAGNOSIS (4)

ⓅWith CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after start the engine.
4. Perform "Self Diagnostic Result" of "ABS".

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

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

YES >> GO TO 17.

NO >> Inspection End.

17. CHECK WHEEL SENSOR HARNESS

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

Power Supply Circuit

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E127	20	Ground	No
	10		
	8		
	18		

Is the inspection result normal?

YES >> GO TO 18.

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

18. CHECK DATA MONITOR (4)

Ⓜ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 19.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

19. PERFORM SELF-DIAGNOSIS (5)

Ⓜ With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after start the engine.
4. Perform "Self Diagnostic Result" of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

C1105, C1106, C1107, C1108 WHEEL SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Inspection End.

20. REPLACE SENSOR ROTOR

④ With CONSULT

1. Replace the sensor rotor.
 - Front: Refer to [BRC-159. "Removal and Installation - Front Sensor Rotor"](#).
 - Rear: Refer to [BRC-159. "Removal and Installation - Rear Sensor Rotor"](#).
2. Erase "Self Diagnostic Result" of "ABS".
3. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
6. Stop the vehicle.
7. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
8. Start the engine.
NOTE:
Wait at least 10 seconds after start the engine.
9. Perform "Self Diagnostic Result" of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).

NO >> Inspection End.

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1109 POWER AND GROUND SYSTEM

DTC Description

INFOID:000000012551843

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1109	BATTERY VOLTAGE [ABNORMAL] (Battery voltage [abnormal])	When ignition power supply voltage is in following state: <ul style="list-style-type: none">• Ignition power supply voltage: $10\text{ V} \geq$ ignition power supply voltage.• Ignition power supply voltage: $16\text{ V} \leq$ ignition power supply voltage.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Charge system	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• IPDM E/R• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Charge system


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1109" detected?

YES-1 >> "C1109" is displayed as "CRNT": Proceed to [BRC-79, "Diagnosis Procedure"](#).

YES-2 >> "C1109" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551844

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

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

C1109 POWER AND GROUND SYSTEM

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

2. PERFORM SELF-DIAGNOSIS

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1109" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4. CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Description

INFOID:000000012551845

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Turn the ignition switch OFF → ON, and wait 30 seconds.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1111" detected?

YES-1 >> "C1111" is displayed as "CRNT": Proceed to [BRC-81, "Diagnosis Procedure"](#).

YES-2 >> "C1111" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551846

1. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 3.

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

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

2. PERFORM SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Turn the ignition switch OFF → ON, and wait 30 seconds.
2. Start the engine.
3. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
4. Stop the vehicle.
5. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
6. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
7. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1111" detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

4. ERASE SELF-DIAGNOSIS RESULT (1)

Ⓟ With CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
3. Stop the vehicle.
4. Erase "Self Diagnostic Result" of "ABS".
5. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.

>> Inspection End.

5. CHECK TERMINAL

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

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).
NO >> Repair / replace harness or connector, and GO TO 6.

6. ERASE SELF-DIAGNOSIS RESULT (2)

Ⓟ With CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
3. Stop the vehicle.
4. Erase "Self Diagnostic Result" of "ABS".

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

5. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

>> Inspection End.

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C1115 WHEEL SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

C1115 WHEEL SENSOR

DTC Description

INFOID:000000012551847

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Wheel sensor• Sensor rotor• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Wheel sensor• Sensor rotor• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Tire size

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ With CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES-1 >> "C1115" is displayed as "CRNT": Proceed to [BRC-84, "Diagnosis Procedure"](#).

YES-2 >> "C1115" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551848

CAUTION:

Never check between wheel sensor harness connector terminals.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

1. CHECK TIRE

Check the tire air pressure, wear and size. Refer to [WT-67, "Tire Air Pressure"](#).

Is the inspection result normal?

YES >> GO TO 4.

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

2. CHECK DATA MONITOR (1)

Ⓜ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS"

2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

4. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 3.

NO >> GO TO 4.

3. PERFORM SELF-DIAGNOSIS (1)

Ⓜ With CONSULT

1. Stop the vehicle.

2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES >> GO TO 4.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, fuse, or fusible link.

5. CHECK WHEEL SENSOR AND SENSOR ROTOR

1. Turn the ignition switch OFF.

2. Disconnect wheel sensor harness connector.

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

CAUTION:

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

• Front: Refer to [BRC-155, "Exploded View - Front Wheel Sensor"](#).

• Rear: Refer to [BRC-156, "Exploded View - Rear Wheel Sensor"](#).

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

>> GO TO 6.

6. CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 8.

7. CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 11.

NO >> GO TO 8.

8. REPLACE WHEEL SENSOR (1)

Ⓜ With CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-155, "Removal and Installation - Front Wheel Sensor"](#).
 - Rear: Refer to [BRC-157, "Removal and Installation - Rear Wheel Sensor"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 9.

NO >> GO TO 19.

9. PERFORM SELF-DIAGNOSIS (2)

Ⓜ With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Perform "Self Diagnostic Result" of "ABS".

C1115 WHEEL SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

Is DTC "C1115" detected?

YES >> GO TO 10.

NO >> Inspection End.

10. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 12.

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

11. CHECK DATA MONITOR (2)

Ⓜ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS"
2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.
4. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 12.

NO >> GO TO 13.

12. PERFORM SELF-DIAGNOSIS (3)

Ⓜ With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES >> GO TO 13.

NO >> Inspection End.

13. CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 16.

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

14. CHECK DATA MONITOR (3)

Ⓜ With CONSULT

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

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C1115 WHEEL SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
 Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.
NOTE:
 Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

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

15. PERFORM SELF-DIAGNOSIS (4)

Ⓟ With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
 Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
 Wait at least 10 seconds after starting the engine.
4. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

- YES >> GO TO 16.
 NO >> Inspection End.

16. CHECK WHEEL SENSOR HARNESS

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

Power Supply Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E127	20	E18	(Front LH wheel)	1 Yes
	10	E43	(Front RH wheel)	
	8	C10	(Rear LH wheel)	
	18	C11	(Rear RH wheel)	

Signal Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E127	19	E18	(Front LH wheel)	2 Yes
	9	E43	(Front RH wheel)	
	7	C10	(Rear LH wheel)	
	17	C11	(Rear RH wheel)	

C1115 WHEEL SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

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

Power Supply Circuit

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E127	20	Ground	No
	10		
	8		
	18		

Is the inspection result normal?

YES >> GO TO 17.

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

17. CHECK DATA MONITOR (4)

Ⓜ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 18.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

18. PERFORM SELF-DIAGNOSIS (5)

Ⓜ With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Inspection End.

19. REPLACE SENSOR ROTOR

Ⓜ With CONSULT

1. Replace the sensor rotor.
 - Front: Refer to [BRC-159, "Removal and Installation - Front Sensor Rotor"](#).
 - Rear: Refer to [BRC-159, "Removal and Installation - Rear Sensor Rotor"](#).
2. Erase "Self Diagnostic Result" of "ABS"

C1115 WHEEL SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

3. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

6. Stop the vehicle.
7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).
- NO >> Inspection End.

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1116 STOP LAMP SWITCH

DTC Description

INFOID:000000012551849

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1116	STOP LAMP SW (Stop lamp switch)	<ul style="list-style-type: none"> When stop lamp switch signal is not input when brake pedal operates. When stop lamp switch signal is input when brake pedal is not operated.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> Harness or connector Stop lamp switch signal circuit 	<ul style="list-style-type: none"> Harness or connector Stop lamp switch ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

④ With CONSULT

- Turn the ignition switch OFF, and wait 10 seconds or more.
- Start the engine.

NOTE:

Stop the vehicle.

- Wait 1 minute or more.

NOTE:

Never depress brake pedal.

- Depress brake pedal by 100 mm (3.94 in) or more, and maintain at that position for a minimum of 1 minute or more.

- Release brake pedal, and wait 1 minute or more.

- Repeat step 4 to 5 ten or more times.

- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1116" detected?

YES-1 >> "C1116" is displayed as "CRNT": Proceed to [BRC-92, "Diagnosis Procedure"](#).

YES-2 >> "C1116" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

Diagnosis Procedure

INFOID:000000012551850

NOTE:

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

1. INTERVIEW FROM THE CUSTOMER

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

Is there such a history?

YES >> GO TO 2.

NO >> GO TO 3.

2. PERFORM SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS"

2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Depress the brake pedal several times.

5. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

6. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

7. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1116" detected?

YES >> GO TO 3.

NO >> Inspection End.

3. STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamps turn ON.

Do the stop lamps turn ON?

YES >> GO TO 5.

NO >> Check the stop lamp system. Refer to [EXL-80. "Wiring Diagram"](#). GO TO 4.

4. CHECK DATA MONITOR (1)

Ⓟ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS"

2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Select "DATA MONITOR" of "ABS", check "STOP LAMP SW". Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-42. "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 5.

5. CHECK CONNECTOR AND TERMINAL

1. Turn the ignition switch OFF.

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

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

C1116 STOP LAMP SWITCH

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

4. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
5. Disconnect stop lamp switch harness connector.
6. Check the stop lamp switch harness connector for disconnection or looseness.
7. Check the stop lamp switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 6.

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair / replace harness, connector, fuse, or fusible link.

7. CHECK DATA MONITOR (2)

Ⓜ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS"
2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Select "DATA MONITOR" of "ABS", check "STOP LAMP SW". Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-42. "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 8.

8. CHECK STOP LAMP SWITCH CIRCUIT (1)

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

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E127	5	Ground	Brake pedal depressed	Battery voltage
			Brake pedal not depressed	0 V

4. Turn the ignition switch ON.
5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E127	5	Ground	Brake pedal depressed	Battery voltage
			Brake pedal not depressed	0 V

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).

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

9. CHECK STOP LAMP SWITCH CIRCUIT (2)

1. Turn the ignition switch OFF.

C1116 STOP LAMP SWITCH

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

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

ABS actuator and electric unit (control unit)		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
E127	5	E38	2	Yes

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E127	5	Ground	No

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).

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

10.CHECK DATA MONITOR (3)

ⓅWith CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect stop lamp switch harness connector.
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.

NOTE:

Stop the vehicle.

6. Select "DATA MONITOR" of "ABS", check "STOP LAMP SW". Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-42. "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).

Component Inspection

INFOID:000000012551851

1.CHECK STOP LAMP SWITCH

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

Stop lamp switch	Condition	Continuity
Terminal		
1 – 2	When stop lamp switch is released (When brake pedal is depressed)	Yes
	When stop lamp switch is pressed (When brake pedal is released)	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the stop lamp switch. Refer to [BR-20. "Removal and Installation"](#).

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Description

INFOID:000000012551852

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1120", "C1122", "C1124" or "C1126" is displayed as "CRNT": Proceed to [BRC-95, "Diagnosis Procedure"](#).

YES-2 >> "C1120", "C1122", "C1124" or "C1126" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551853

1. CHECK CONNECTOR

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

YES >> GO TO 3.

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

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Description

INFOID:000000012551854

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

④ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1121", "C1123", "C1125" or "C1127" is displayed as "CRNT": Proceed to [BRC-97, "Diagnosis Procedure"](#).

YES-2 >> "C1121", "C1123", "C1125" or "C1127" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551855

1. CHECK CONNECTOR

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

YES >> GO TO 3.

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

2.PERFORM SELF-DIAGNOSIS

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1130 ENGINE SIGNAL

DTC Description

INFOID:000000012551856

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line	<ul style="list-style-type: none">• Harness or connector• ECM• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1130" detected?

YES-1 >> "C1130" is displayed as "CRNT": Proceed to [BRC-99, "Diagnosis Procedure"](#).

YES-2 >> "C1130" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551857

1. CHECK ENGINE SYSTEM

 With CONSULT

Perform "Self Diagnostic Result" of "ENGINE".

Is DTC detected?

YES >> Check the DTC. Refer to [EC-104, "DTC Index"](#) (VQ35DE FOR USA AND CANADA) or [EC-592, "DTC Index"](#) (VQ35DE FOR MEXICO).

NO >> GO TO 2.

C1130 ENGINE SIGNAL

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136](#), "[Diagnosis Procedure](#)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, fuse, or fusible link.

3. CHECK CONNECTOR AND TERMINAL

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

Is the inspection result normal?

YES >> GO TO 4.

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

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

 With CONSULT

1. Connect ECM harness connector.
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1130" or "U1000" detected?

YES ("C1130")>>GO TO 1.

YES ("U1000")>>Refer to [LAN-21](#), "[Trouble Diagnosis Flow Chart](#)".

NO >> Inspection End.

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1140 ACTUATOR RELAY SYSTEM

DTC Description

INFOID:000000012551858

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1140" detected?

YES-1 >> "C1140" is displayed as "CRNT": Proceed to [BRC-101, "Diagnosis Procedure"](#).

YES-2 >> "C1140" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551859

1. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 3.

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

2. PERFORM SELF-DIAGNOSIS

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4. CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1142 PRESS SENSOR

DTC Description

INFOID:000000012551860

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Air inclusion in the brake piping• Stop lamp switch system• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Stop lamp switch system• ABS actuator and electric unit (control unit)• Brake system• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Air inclusion in the brake piping


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1142" detected?

YES-1 >> "C1142" is displayed as "CRNT": Proceed to [BRC-103, "Diagnosis Procedure"](#).

YES-2 >> "C1142" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551861

1. STOP LAMP SWITCH SYSTEM

Check the stop lamp switch system. Refer to [BRC-92, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace stop lamp switch system.

2. CHECK BRAKE FLUID LEAKAGE

< DTC/CIRCUIT DIAGNOSIS >

Check the brake fluid leakage. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace brake fluid leakage part.

3.CHECK BRAKE PIPING

Check the brake piping. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace brake piping.

- Front: Refer to [BR-23, "FRONT : Removal and Installation"](#).

- Rear: Refer to [BR-26, "REAR : Removal and Installation"](#).

4.CHECK BRAKE PEDAL

Check the brake pedal.

- Brake pedal height: Refer to [BR-7, "Inspection"](#).

- Brake pedal assembly: Refer to [BR-20, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust the brake pedal height or replace brake pedal assembly.

- Adjust the brake pedal: Refer to [BR-13, "Adjustment"](#).

- Replace the brake pedal: Refer to [BR-20, "Removal and Installation"](#).

5.CHECK BRAKE MASTER CYLINDER

Check the brake master cylinder. Refer to [BR-9, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace brake master cylinder. Refer to [BR-28, "Removal and Installation"](#).

6.CHECK BRAKE BOOSTER

Check the brake booster. Refer to [BR-10, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace brake booster. Refer to [BR-31, "Removal and Installation"](#).

7.CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-33, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace vacuum piping. Refer to [BR-33, "Removal and Installation"](#).

8.CHECK FRONT DISC BRAKE

Check the front disc brake caliper. Refer to [BR-36, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace front disc brake caliper. Refer to [BR-37, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).

9.CHECK REAR DISC BRAKE

Check the rear disc brake. Refer to [BR-41, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace rear disc brake. Refer to [BR-42, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).

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

C1142 PRESS SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136](#), "[Diagnosis Procedure](#)".

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness, connector, fuse, or fusible link.

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

 With CONSULT

1. Erase "Self Diagnostic Result" of "ABS".

2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Start the engine and drive the vehicle for a short period of time.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

5. Stop the vehicle.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1142" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160](#), "[Removal and Installation](#)".

NO >> Check the ABS actuator and electric unit (control unit) harness connector and terminal for damage, looseness and disconnection. Repair / replace harness, connector, or terminal.

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C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1143 STEERING ANGLE SENSOR

DTC Description

INFOID:000000012551862

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line• Incomplete neutral position adjustment of steering angle sensor• Improper installation of steering angle sensor	<ul style="list-style-type: none">• Harness or connector• Steering angle sensor• ABS actuator and electric unit (control unit)• IPDM E/R• CAN communication line• Wheel alignment• Incomplete neutral position adjustment of steering angle sensor• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1143" detected?

YES-1 >> "C1143" is displayed as "CRNT": Proceed to [BRC-106, "Diagnosis Procedure"](#).

YES-2 >> "C1143" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551863

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

 With CONSULT

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-62, "Description"](#).

C1143 STEERING ANGLE SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS (1)

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1143" detected?

YES-1 >> "C1143" is displayed as "CRNT": GO TO 3.

YES-2 >> "C1143" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO >> Inspection End.

3. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 5.

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

4. PERFORM SELF-DIAGNOSIS (2)

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1143" detected?

YES >> GO TO 5.

NO >> Inspection End.

5. CHECK STEERING ANGLE SENSOR POWER SUPPLY

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

Steering angle sensor		—	Voltage (Approx.)
Connector	Terminal		
M54	4	Ground	0 V

4. Turn the ignition switch ON.

NOTE:

Start the engine.

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

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

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

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C1143 STEERING ANGLE SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

6. CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check fuse 49 (10A).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between steering angle sensor harness connector and IPDM E/R harness connector.

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

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M54	4	Ground	No

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

NO >> Repair / replace harness, connector, or fuse.

7. CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M54	1	Ground	Yes

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair / replace harness or connector.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair / replace harness, connector, fuse, or fusible link.

9. CHECK TERMINAL

1. Check the steering angle sensor pin terminals for damage or loose connection with harness connector.
2. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair / replace harness, connector, or terminal.

10. CHECK CAN COMMUNICATION LINE

Check the CAN communication line. Refer to [LAN-21, "Trouble Diagnosis Flow Chart"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness or connector.

11. CHECK DATA MONITOR

 With CONSULT

1. Select "DATA MONITOR" of "ABS", check "STR ANGLE SIG".

C1143 STEERING ANGLE SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

2. Check that the indication changes with the steering angle when the steering wheel is turned left/right from the neutral position. Refer to [BRC-42, "Reference Value"](#).

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Replace the steering angle sensor. Refer to [BRC-164, "Removal and Installation"](#).

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C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Description

INFOID:000000012551864

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1144	ST ANG SEN SIGNAL (Steering angle sensor not complete)	When neutral position adjustment of steering angle sensor is not complete.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
Incomplete neutral position adjustment of steering angle sensor	<ul style="list-style-type: none">• Harness or connector• Steering angle sensor• ABS actuator and electric unit (control unit)• Incomplete neutral position adjustment of steering angle sensor

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1144" detected?

YES-1 >> "C1144" is displayed as "CRNT": Proceed to [BRC-110. "Diagnosis Procedure"](#).

YES-2 >> "C1144" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551865

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-62. "Description"](#).

>> GO TO 2.

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

Ⓜ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1144" detected?

YES >> GO TO 3.

NO >> Inspection End.

3.CHECK STEERING ANGLE SENSOR SYSTEM

1. Turn the ignition switch OFF.

2. Check the steering angle sensor system. Refer to [BRC-106. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, or terminal.

4.CHECK DATA MONITOR

 With CONSULT

1. Select "DATA MONITOR" of "ABS", check "STR ANGLE SIG".

2. Check that the indication changes with the steering angle when the steering wheel is turned left/right from the neutral position. Refer to [BRC-42. "Reference Value"](#).

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).

NO >> Replace the steering angle sensor. Refer to [BRC-164. "Removal and Installation"](#).

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C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

DTC Description

INFOID:000000012551866

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1145	YAW RATE SENSOR (Yaw rate sensor circuit)	<ul style="list-style-type: none">When a malfunction is detected in yaw rate signal.When a signal line of yaw rate/side/decel G sensor is open or shorted.
C1146	SIDE G SEN CIRCUIT (Side G sensor circuit)	<ul style="list-style-type: none">When a malfunction is detected in side/decel G signal.When a signal line of yaw rate/side/decel G sensor is open or shorted.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">Harness or connectorABS actuator and electric unit (control unit) power supply systemFuseFusible linkBattery	<ul style="list-style-type: none">Harness or connectorYaw rate/side/decel G sensorABS actuator and electric unit (control unit)ABS actuator and electric unit (control unit) power supply systemFuseFusible linkBattery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1145" or "C1146" detected?

YES-1 >> "C1145" or "C1146" is displayed as "CRNT": Proceed to [BRC-112, "Diagnosis Procedure"](#).

YES-2 >> "C1145" or "C1146" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551867

CAUTION:

• A malfunction in yaw rate/side/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function is OFF (VDC OFF indicator lamp is in ON status). This is not a malfunction if the status returns to normal after engine is started again. In that case, erase self-diagnosis result memory using CONSULT.

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

- When the engine is in running status and the vehicle is on a turntable at the entrance of parking lot or on a moving unit, VDC warning lamp may turn ON and “ABS” self-diagnosis may display “YAW RATE SENSOR”. In this case, yaw rate sensor is not malfunctioning. The status returns to normal when the vehicle is left from the turntable or moving unit and the engine is started again. In that case, erase self-diagnosis result memory using CONSULT.

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

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

Yaw rate/side/decel G sensor		—	Voltage (Approx.)
Connector	Terminal		
M160	4	Ground	0 V

4. Turn the ignition switch ON.
- NOTE:**
Never start engine.
5. Check the voltage between yaw rate/side/decel G sensor harness connector and ground.

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK YAW RATE/SIDE/DECEL G SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check fuse 49 (10A).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between yaw rate/side/decel G sensor harness connector and IPDM E/R harness connector.

Yaw rate/side/decel G sensor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
M160	4	E119	35	Yes

5. Check the continuity between yaw rate/side/decel G sensor harness connector and ground.

Yaw rate/side/decel G sensor		—	Continuity
Connector	Terminal		
M160	4	Ground	No

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

NO >> Repair / replace harness, connector, or fuse.

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

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

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

Is the inspection result normal?

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C1145, C1146 YAW RATE/SIDE/DECCEL G SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 4.
NO >> Repair / replace harness or connector.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

5.CHECK COMMUNICATION LINE

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

Yaw rate/side/deccl G sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
M160	2	E127	6	Yes
	3		16	

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair / replace harness or connector. Refer to [BRC-8, "Precaution for Harness Repair"](#).


6.CHECK TERMINAL

1. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
2. Check the yaw rate/side/deccl G sensor pin terminals for damage or loose connection with harness connector.
3. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

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

7.REPLACE YAW RATE/SIDE/DECCEL G SENSOR

 With CONSULT.

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the yaw rate/side/deccl G sensor. Refer to [BRC-162, "Removal and Installation"](#).
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON.

NOTE:

Never start engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1145" or "C1146" detected?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).
NO >> Inspection End.

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1155 BRAKE FLUID LEVEL SWITCH

DTC Description

INFOID:000000012551868

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1155	BR FLUID LEVEL LOW (Brake fluid level low)	<ul style="list-style-type: none"> When brake fluid level low signal is detected. When an open circuit is detected in brake fluid level switch circuit.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> Harness or connector Brake fluid level is low 	<ul style="list-style-type: none"> Harness or connector ABS actuator and electric unit (control unit) Brake fluid level switch Combination meter Brake fluid level is low

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT

- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

YES-1 >> "C1155" is displayed as "CRNT": Proceed to [BRC-115, "Diagnosis Procedure"](#).

YES-2 >> "C1155" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551869

1. CHECK BRAKE FLUID LEVEL

- Turn the ignition switch OFF.
- Check the brake fluid level. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Refill brake fluid. Refer to [BR-14, "Drain and Refill"](#). GO TO 2.

2. PERFORM SELF-DIAGNOSIS (1)

With CONSULT

- Erase "Self Diagnostic Result" of "ABS"

C1155 BRAKE FLUID LEVEL SWITCH

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 3.

NO >> Inspection End.

3. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Check the combination meter harness connector for disconnection or looseness.
- Check the brake fluid level switch harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 5.

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

4. PERFORM SELF-DIAGNOSIS (2)

Ⓟ With CONSULT

- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 5.

NO >> Inspection End.

5. CHECK BRAKE FLUID LEVEL SWITCH

Check the brake fluid level switch. Refer to [BR-28, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace the reservoir tank. Refer to [BR-28, "Exploded View"](#). GO TO 6.

6. PERFORM SELF-DIAGNOSIS (3)

Ⓟ With CONSULT

- Erase "Self Diagnostic Result" of "ABS"
- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 7.

NO >> Inspection End.

7. CHECK CONNECTOR AND TERMINAL

- Turn the ignition switch OFF.
- Disconnect brake fluid level switch harness connector.
- Check the brake fluid level switch harness connector for disconnection or looseness.
- Check the brake fluid level switch pin terminals for damage or loose connection with harness connector.
- Disconnect combination meter harness connector.

C1155 BRAKE FLUID LEVEL SWITCH

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

6. Check the combination meter harness connector for disconnection or looseness.
7. Check the combination meter pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 9.
NO >> Repair / replace harness, connector, or terminal, and GO TO 8.

8.PERFORM SELF-DIAGNOSIS (4)

ⓂWith CONSULT

1. Erase "Self Diagnostic Result" of "ABS"
2. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

- YES >> GO TO 9.
NO >> Inspection End.

9.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

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

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

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

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

Is the inspection result normal?

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

10.CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

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

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

Is the inspection result normal?

- YES >> GO TO 11.
NO >> Repair / replace harness or connector, and GO TO 11.

11.CHECK COMBINATION METER

Check the combination meter. Refer to [MWI-18, "CONSULT Function \(METER/M&A\)"](#).

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

C1155 BRAKE FLUID LEVEL SWITCH

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace combination meter. Refer to [MWI-85. "Removal and Installation"](#).

Component Inspection

INFOID:000000012551870

1. CHECK BRAKE FLUID LEVEL SWITCH

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

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the reservoir tank. Refer to [BR-28. "Exploded View"](#).

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

DTC Description

INFOID:000000012551871

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1160	DECEL G SEN SET (Decel G sensor set)	When calibration of yaw rate/side/decel G sensor is not complete.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Incomplete calibration of decel G sensor• ABS actuator and electric unit (control unit)• Yaw rate/side/decel G sensor• Harness or connector

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1160" detected?

YES-1 >> "C1160" is displayed as "CRNT": Proceed to [BRC-119. "Diagnosis Procedure"](#).

YES-2 >> "C1160" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551872

1. DECEL G SENSOR CALIBRATION

Perform decel G sensor calibration. Refer to [BRC-64. "Work Procedure"](#).

>> GO TO 2.

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

Ⓜ With CONSULT

Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1160" detected?

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

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

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

1. Turn the ignition switch OFF.
2. Check the yaw rate/side/decel G sensor system. Refer to [BRC-112. "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).
- NO >> Replace the yaw rate/side/decel G sensor. Refer to [BRC-162. "Removal and Installation"](#).

C1164, C1165 CV SYSTEM

DTC Description

INFOID:000000012551873

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1164	CV 1 (Cut valve 1)	When a malfunction is detected in cut valve 1.
C1165	CV 2 (Cut valve 2)	When a malfunction is detected in cut valve 2.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION?

Ⓜ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1164" or "C1165" detected?

YES-1 >> "C1164" or "C1165" is displayed as "CRNT": Proceed to [BRC-121, "Diagnosis Procedure"](#).

YES-2 >> "C1164" or "C1165" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551874

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

C1164, C1165 CV SYSTEM

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

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

2.PERFORM SELF-DIAGNOSIS

Ⓜ With CONSULT

Perform "Self Diagnostic Result" of "ABS" again.

Is DTC "C1164" or "C1165" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

C1170 VARIANT CODING

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1170 VARIANT CODING

DTC Description

INFOID:0000000012551875

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1170	VARIANT CODING (Variant coding)	When the information in ABS actuator and electric unit (control unit) is not the same.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
—	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1170" detected?

YES-1 >> "C1170" is displayed as "CRNT": Proceed to [BRC-123. "Diagnosis Procedure"](#).

YES-2 >> "C1170" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012551876

1. CHECK SELF-DIAGNOSIS RESULTS

Ⓜ With CONSULT

Replace the ABS actuator and electric unit (control unit) even if other DTC are displayed along with "C1170" in "Self Diagnostic Result" of "ABS".

>> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1197 VACUUM SENSOR

DTC Description

INFOID:000000012551877

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1197	VACUUM SENSOR (Vacuum sensor)	When a malfunction is detected in vacuum sensor.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• Vacuum piping• ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ With CONSULT

1. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1197" detected?

- YES-1 >> "C1197" is displayed as "CRNT": Proceed to [BRC-124, "Diagnosis Procedure"](#).
YES-2 >> "C1197" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").
NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551878

1. CHECK CONNECTOR

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

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair / replace harness or connector, and GO TO 2.

2. CHECK BRAKE BOOSTER

1. Turn the ignition switch OFF.

C1197 VACUUM SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

2. Check the brake booster. Refer to [BR-10, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the brake booster. Refer to [BR-31, "Removal and Installation"](#).

3. CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-33, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the vacuum piping. Refer to [BR-33, "Removal and Installation"](#).

4. CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, or terminal.

5. CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E167	1	E127	13	Yes
	2		32	
	3		28	

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

Vacuum sensor		—	Continuity
Connector	Terminal		
E167	1	Ground	No
	2		
	3		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness or connector.

6. REPLACE VACUUM SENSOR

Ⓜ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BR-31, "Removal and Installation"](#).

3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1197" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).

NO >> Inspection End.

C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1198 VACUUM SENSOR

DTC Description

INFOID:000000012551879

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1198	VACUUM SEN CIR (Vacuum sensor circuit)	<ul style="list-style-type: none">• When an open circuit is detected in vacuum sensor circuit.• When a short circuit is detected in vacuum sensor circuit.• When a malfunction is detected in vacuum sensor noise.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1198" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-127, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551880

1. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair / replace harness or connector, and GO TO 2.

2. CHECK TERMINAL

C1198 VACUUM SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, or terminal.

3. CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E167	1	E127	13	Yes
	2		32	
	3		28	

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

Vacuum sensor		—	Continuity
Connector	Terminal		
E167	1	Ground	No
	2		
	3		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness or connector.

4. REPLACE VACUUM SENSOR

With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BR-31, "Removal and Installation"](#).

3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1198" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Inspection End.

C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C1199 BRAKE BOOSTER

DTC Description

INFOID:0000000012551881

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1199	BRAKE BOOSTER (Brake booster)	When brake booster vacuum is approx. 0 kPa (0 mm Hg) during engine running.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • Vacuum sensor (brake booster) • Vacuum piping • ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

④ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1199" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-129. "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012551882

1. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair / replace harness or connector, and GO TO 2.

2. CHECK BRAKE BOOSTER

C1199 BRAKE BOOSTER

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Check the brake booster. Refer to [BR-10, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Replace the brake booster. Refer to [BR-31, "Removal and Installation"](#).

3.CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-33, "Exploded View"](#).

Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace the vacuum piping. Refer to [BR-33, "Removal and Installation"](#).

4.CHECK TERMINAL

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

Is the inspection result normal?

- YES >> GO TO 5.
 NO >> Repair / replace harness, connector, or terminal.

5.CHECK VACUUM SENSOR CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E167	1	E127	13	Yes
	2		32	
	3		28	

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

Vacuum sensor		—	Continuity
Connector	Terminal		
E167	1	Ground	No
	2		
	3		

Is the inspection result normal?

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

6.REPLACE VACUUM SENSOR

Ⓜ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BR-31, "Removal and Installation"](#).

3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1199" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Inspection End.

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C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

C119A VACUUM SENSOR

DTC Description

INFOID:000000012551883

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C119A	VACUUM SEN VOLT (Vacuum sensor voltage)	When a malfunction is detected in supply power voltage of vacuum sensor.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C119A" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-132, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#)

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551884

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.

2. Check the vacuum sensor harness connector for disconnection or looseness.

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness or connector, and GO TO 2.

C119A VACUUM SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

2. CHECK VACUUM SENSOR POWER SUPPLY

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

Vacuum sensor		—	Voltage (Approx.)
Connector	Terminal		
E167	3	Ground	0 V

4. Turn the ignition switch ON.
NOTE:
Start the engine.
5. Check the voltage between vacuum sensor harness connector and ground.

Vacuum sensor		—	Voltage (Approx.)
Connector	Terminal		
E167	3	Ground	5 V

Is the inspection result normal?

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

3. CHECK VACUUM SENSOR POWER SUPPLY CIRCUIT

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

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E167	3	E127	28	Yes

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

Vacuum sensor		—	Continuity
Connector	Terminal		
E167	3	Ground	No

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair / replace harness or connector.

4. CHECK VACUUM SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E167	2	Ground	No

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair / replace harness or connector.

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

C119A VACUUM SENSOR

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-136](#). "[Diagnosis Procedure](#)".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, fuse, or fusible link.

6.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160](#). "[Removal and Installation](#)".

NO >> Repair / replace harness, connector, or terminal.

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000012551885

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
U1000	CAN COMM CIRCUIT (CAN communication circuit)	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• CAN communication line	CAN communication system malfunction

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "U1000" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-135, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551886

Proceed to [LAN-21, "Trouble Diagnosis Flow Chart"](#).

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000012551887

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

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E127	34	Ground	0 V

4. Turn the ignition switch ON

NOTE:

Start the engine.

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E127	34	Ground	Battery voltage

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 the 10A fuse (49).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R.

ABS actuator and electric unit (control unit)		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E127	34	E119	35	Yes

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E127	34	Ground	No

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

NO >> Repair / replace harness, connector, or fuse.

3. CHECK MOTOR AND MOTOR RELAY POWER SUPPLY

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

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

3. Turn the ignition switch ON.

NOTE:

POWER SUPPLY AND GROUND CIRCUIT

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

Start the engine.

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

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

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 the 50A fusible link (I).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal 4 and 50A fusible link (I).

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply.
NO >> Repair / replace harness, connector, or fusible link.

5.CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E127	3	Ground	Battery voltage

3. Turn the ignition switch ON

NOTE:

Start the engine.

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

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E127	3	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 7.
NO >> GO TO 6.

6.CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY CIRCUIT

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

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply.
NO >> Repair / replace harness, connector, or fusible link.

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

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

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E127	1	Ground	Yes
	2		

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair / replace harness, connector, or terminal.

8. CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

PARKING BRAKE SWITCH

Description

INFOID:000000012551888

Transmits the parking brake switch signal to the combination meter.

Component Function Check

INFOID:000000012551889

1.COMBINATION METER INPUT SIGNAL

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

Condition **CONSULT**
Parking brake applied : **ON**
Parking brake released : **OFF**

>> Inspection End.

Diagnosis Procedure

INFOID:000000012551890

Regarding Wiring Diagram information, refer to [MWI-31, "Wiring Diagram"](#).

1.CHECK PARKING BRAKE SWITCH CIRCUIT

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

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

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

Combination meter		Ground	Continuity
Connector	Terminal		
M24	12		No

Is the inspection result normal?

- YES >> Inspection End.
NO >> Repair or replace harness or connectors.

Component Inspection

INFOID:000000012551891

1.CHECK PARKING BRAKE SWITCH

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

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

Is the inspection result normal?

- YES >> Inspection End.
NO >> Replace parking brake switch. Refer to [PB-7, "Exploded View"](#).

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VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

VDC OFF SWITCH

Component Function Check

INFOID:000000012551892

1. CHECK VDC OFF SWITCH OPERATION

Check that VDC OFF indicator lamp in combination meter turns ON/OFF when VDC OFF switch is operated.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-140, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012551893

Regarding Wiring Diagram information, refer to [BRC-49, "Wiring Diagram"](#).

1. CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector E127 and VDC OFF switch connector M71.
3. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

2. CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to [BRC-141, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace VDC OFF switch.

3. CHECK VDC OFF SWITCH SIGNAL

 With CONSULT.

1. Connect ABS actuator and electric unit (control unit) connector E127 and VDC OFF switch connector M71.
2. Turn ignition switch ON.
3. In "DATA MONITOR" select "OFF SW" and check VDC OFF switch signal.

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

Is the inspection result normal?

YES >> Refer to [BRC-58, "Work Flow"](#).

NO >> GO TO 4.

4. CHECK VDC OFF SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector E127 and VDC OFF switch connector M71.
3. Check continuity between ABS actuator and electric unit (control unit) connector E127 terminal 30 and VDC OFF switch connector M71 terminal 1.

ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E127	30	M71	1	Yes

VDC OFF SWITCH

[TYPE 1]

< DTC/CIRCUIT DIAGNOSIS >

4. Check continuity between ABS actuator and electric unit (control unit) connector terminal E127 terminal 30 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E127	30	Ground	No

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning components.

5.CHECK VDC OFF SWITCH GROUND CIRCUIT

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

VDC OFF switch		—	Continuity
Connector	Terminal		
M71	2	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000012551894

1.CHECK VDC OFF SWITCH

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

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace VDC OFF switch.

ABS WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

ABS WARNING LAMP

Component Function Check

INFOID:000000012551895

1. CHECK ABS WARNING LAMP FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-142, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012551896

1. PERFORM THE SELF-DIAGNOSIS

 With CONSULT.

Perform self-diagnostic result.

Are any DTCs detected?

YES >> Refer to [BRC-47, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-9, "METER SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-85, "Removal and Installation"](#).

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

BRAKE WARNING LAMP

Component Function Check

INFOID:000000012551897

1.CHECK BRAKE WARNING LAMP FUNCTION (1)

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to [BRC-143, "Diagnosis Procedure"](#).

2.CHECK BRAKE WARNING LAMP FUNCTION (2)

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Check parking brake switch system. Refer to [BRC-139, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012551898

BRC

1.PERFORM THE SELF-DIAGNOSIS

Ⓜ With CONSULT.

Perform self-diagnostic result.

Are any DTCs detected?

YES >> Refer to [BRC-47, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-9, "METER SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-85, "Removal and Installation"](#).

VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

VDC OFF INDICATOR LAMP

Component Function Check

INFOID:000000012551899

1. CHECK VDC OFF INDICATOR LAMP FUNCTION (1)

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to [BRC-144, "Diagnosis Procedure"](#).

2. CHECK VDC OFF INDICATOR LAMP FUNCTION (2)

Check that VDC OFF indicator lamp in combination meter turns ON/OFF when VDC OFF switch is operated.

Is the inspection result normal?

YES >> Inspection End.

NO >> Check VDC OFF switch. Refer to [BRC-140, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012551900

1. PERFORM THE SELF-DIAGNOSIS

Ⓟ With CONSULT.

Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to [BRC-47, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-9, "METER SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-85, "Removal and Installation"](#).

SLIP INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 1]

SLIP INDICATOR LAMP

Component Function Check

INFOID:000000012551901

1.CHECK SLIP INDICATOR LAMP FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-145, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012551902

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT.

Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to [BRC-47, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-9, "METER SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-160, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-85, "Removal and Installation"](#).

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APPLICATION NOTICE

< SYMPTOM DIAGNOSIS >

[TYPE 1]

SYMPTOM DIAGNOSIS

APPLICATION NOTICE

Application Notice

INFOID:0000000012551903

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

VDC/TCS/ABS

Symptom Table

INFOID:000000012551904

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

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-148, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-149, "Diagnosis Procedure"
	Make sure the braking force is sufficient when the ABS is not operating.	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-150, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-151, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-152, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-153, "Diagnosis Procedure"
	TCM	
	ECM	

NOTE:

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

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EXCESSIVE OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[TYPE 1]

EXCESSIVE OPERATION FREQUENCY

Description

INFOID:000000012551905

VDC function, TCS function, ABS function, EBD function or hill start assist function operates in excessive operation frequency.

Diagnosis Procedure

INFOID:000000012551906

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 [FAX-6, "Inspection"](#).
- Rear axle: Refer to [RAX-5, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

3. CHECK WHEEL SENSOR

Check wheel sensor.

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair installation or replace wheel sensor.

- Front wheel sensor: Refer to [BRC-155, "Removal and Installation - Front Wheel Sensor"](#).
- Rear wheel sensor: Refer to [BRC-157, "Removal and Installation - Rear Wheel Sensor"](#).

4. CHECK SENSOR ROTOR

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair installation or replace sensor rotor.

- Front sensor rotor: Refer to [BRC-159, "Removal and Installation - Front Sensor Rotor"](#).
- Rear sensor rotor: Refer to [BRC-159, "Removal and Installation - Rear Sensor Rotor"](#).

5. CHECK WARNING LAMP TURNS OFF

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn OFF approx. 1 second 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 >> Inspection End.

NO >> Perform self-diagnosis result. Refer to [BRC-36, "CONSULT Function"](#).

UNEXPECTED BRAKE PEDAL REACTION

< SYMPTOM DIAGNOSIS >

[TYPE 1]

UNEXPECTED BRAKE PEDAL REACTION

Description

INFOID:000000012551907

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

Diagnosis Procedure

INFOID:000000012551908

1.CHECK FRONT AND REAR AXLE

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

- Front axle: Refer to [FAX-6. "Inspection"](#).
- Rear axle: Refer to [RAX-5. "Inspection"](#).

Is the inspection result normal?

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

2.CHECK DISC ROTOR

Check disc rotor runout.

- Front: Refer to [BR-16. "DISC ROTOR : Inspection"](#).
- Rear: Refer to [BR-18. "DISC ROTOR : Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Refinish the disc rotor.

3.CHECK BRAKE FLUID LEAKAGE

Check fluid leakage. Refer to [BR-8. "Inspection"](#).

Is the inspection result normal?

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

4.CHECK BRAKE PEDAL

Check brake pedal. Refer to [BR-7. "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 5.
- NO >> Adjust brake pedal. Refer to [BR-13. "Adjustment"](#).

5.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Check brake system.

6.CHECK BRAKE PERFORMANCE

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

Is the inspection result normal?

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

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THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[TYPE 1]

THE BRAKING DISTANCE IS LONG

Description

INFOID:000000012551909

Brake stopping distance is long when ABS function is operated.

Diagnosis Procedure

INFOID:000000012551910

CAUTION:

Brake stopping distance on slippery roads like a rough road, gravel road or snowy road may become longer when ABS is operated than when ABS is not operated.

1.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2.CHECK BRAKE PERFORMANCE

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[TYPE 1]

ABS FUNCTION DOES NOT OPERATE

Description

INFOID:0000000012551911

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

Diagnosis Procedure

INFOID:0000000012551912

CAUTION:

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

1.CHECK ABS WARNING LAMP

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

CAUTION:

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Perform self-diagnosis result. Refer to [BRC-36, "CONSULT Function"](#).

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BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[TYPE 1]

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

Description

INFOID:0000000012551913

- Brake pedal vibrates and motor sound from ABS actuator and electric unit (control unit) occurs when the engine starts.
- Brake pedal vibrates during braking.

CAUTION:

Vibration may be felt during brake pedal is lightly depressed (just placing a foot on it) in the following conditions. This is normal.

- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [Approx. 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approx. 10 km/h (6.2 MPH) or higher]

Diagnosis Procedure

INFOID:0000000012551914

1. SYMPTOM CHECK 1

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

Do vibrations occur?

YES >> GO TO 2.

NO >> Check brake pedal. Refer to [BR-7. "Inspection"](#).

2. SYMPTOM CHECK 2

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

Does the operation sound occur?

YES >> GO TO 3.

NO >> Perform self-diagnosis result. Refer to [BRC-36. "CONSULT Function"](#).

3. SYMPTOM CHECK 3

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

Does the symptom occur?

YES >> Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit).

NO >> Inspection End.

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

[TYPE 1]

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Description

INFOID:000000012551915

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

Diagnosis Procedure

INFOID:000000012551916

1. CHECK SYMPTOM


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

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 2.

2. PERFORM THE SELF-DIAGNOSIS

 With CONSULT


Perform self-diagnosis result. Refer to [BRC-36. "CONSULT Function"](#).

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-47. "DTC Index"](#).

NO >> GO TO 3.

3. CHECK CONNECTOR

 With CONSULT


1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check connector terminal for deformation, disconnection and looseness.
4. Connect harness connector and perform self-diagnosis result. Refer to [BRC-36. "CONSULT Function"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace connector terminal.

4. CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

 With CONSULT

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

Is any DTC detected?

YES >> Check the DTC.

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-160. "Removal and Installation"](#).

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[TYPE 1]

NORMAL OPERATING CONDITION

Description

INFOID:0000000012551917

Symptom	Result
<p>Brake pedal slightly vibrates and operation sound (motor sound and sound from suspension) occurs when VDC function, TCS function, ABS function, EBD function or hill start assist function operates.</p>	<p>This is not a malfunction, because it is caused by VDC function, TCS function, ABS function, EBD function and hill start assist function that are normally operated.</p>
<p>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.</p>	
<p>Brake pedal vibrates and operation sound occurs during sudden acceleration and cornering, when VDC function or TCS function is operated.</p>	
<p>Brake pedal vibrates and motor sound from the engine room occurs when the engine starts or the vehicle starts just after starting the engine.</p>	<p>This is not a malfunction because it is caused by operation check of ABS actuator and electric unit (control unit).</p>
<p>Acceleration may be felt insufficient depending on the road conditions.</p>	<p>This is not a malfunction because it is caused by TCS function that puts the highest priority to obtain the optimum traction (stability).</p>
<p>TCS function may operate momentarily while driving on a road where friction coefficient varies or when downshifting or fully depressing accelerator pedal.</p>	
<p>ABS warning lamp and VDC warning lamp may turn ON when the vehicle is on a rotating turntable or is given a strong shaking or large vibrations on a ship while the engine is running.</p>	<p>In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. In that case, erase "ABS" self-diagnosis result memory with CONSULT.</p>
<p>VDC warning lamp may turn ON and VDC function and TCS function may not normally operate, when driving on a special road the is extremely slanted (bank in a circuit course).</p>	
<p>A malfunction in yaw rate/side/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function and TCS function are OFF (VDC OFF switch is pressed and VDC OFF indicator lamp is in ON status).</p>	
<p>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.</p>	<p>This is normal. (When checking the vehicle on a chassis dynamometer, operate VDC OFF switch so that TCS function is OFF.)</p>

WHEEL SENSOR

< UNIT REMOVAL AND INSTALLATION >

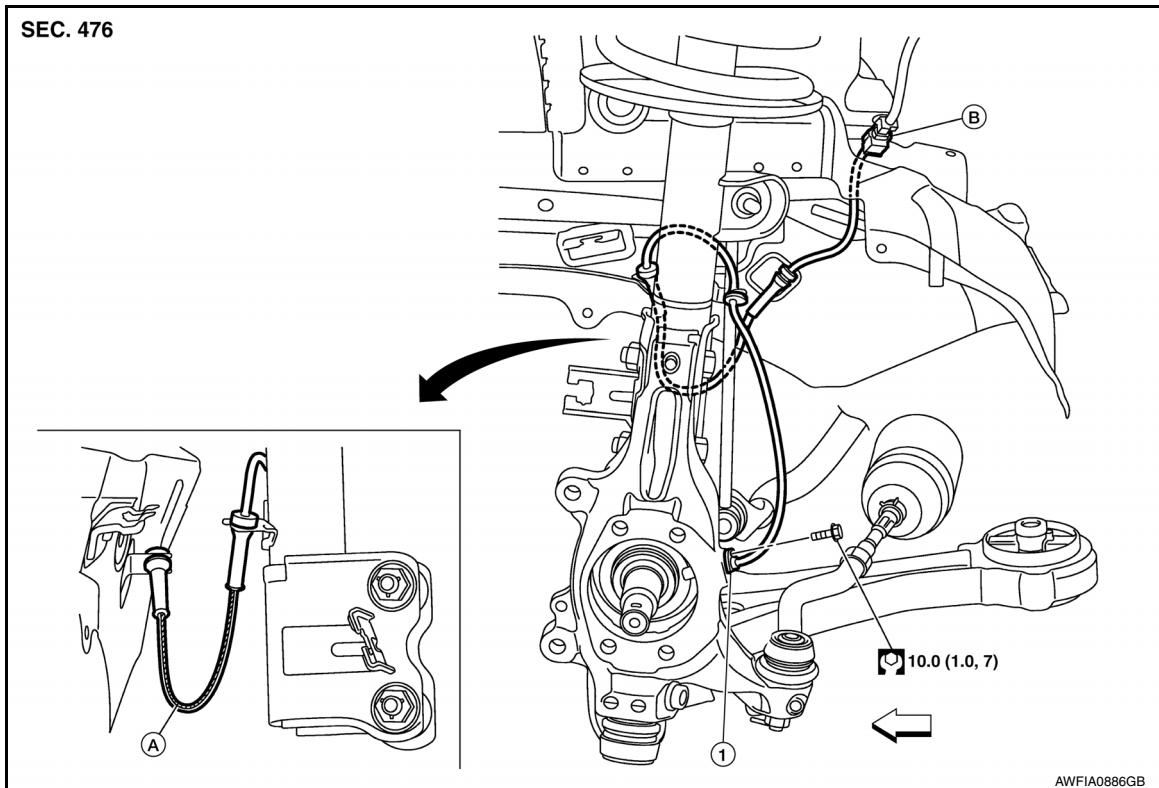
[TYPE 1]

UNIT REMOVAL AND INSTALLATION

WHEEL SENSOR

Exploded View - Front Wheel Sensor

INFOID:000000012551918



1. Front wheel sensor

A. Color line (slant line)

B. Front wheel sensor connector

⇐ Front

Removal and Installation - Front Wheel Sensor

INFOID:000000012551919

CAUTION:

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

REMOVAL

1. Remove the front wheel and tire using power tool. Refer to [WT-59. "Adjustment"](#).
2. Partially remove the fender protector to gain access to the wheel sensor harness connector.
3. Disconnect the front wheel sensor harness connector.
4. Remove the front wheel sensor bolt.
5. Remove the front wheel sensor from the strut bracket and body brackets.
6. Remove the front wheel sensor from the steering knuckle.

INSTALLATION

WHEEL SENSOR

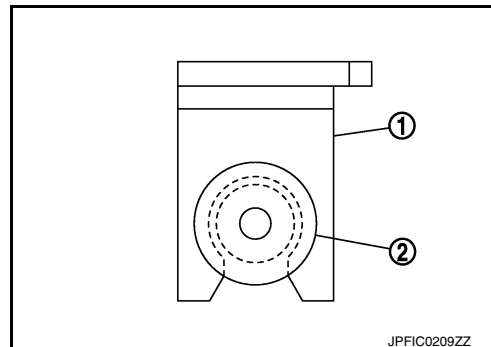
< UNIT REMOVAL AND INSTALLATION >

[TYPE 1]

Installation is in the reverse order of removal.

CAUTION:

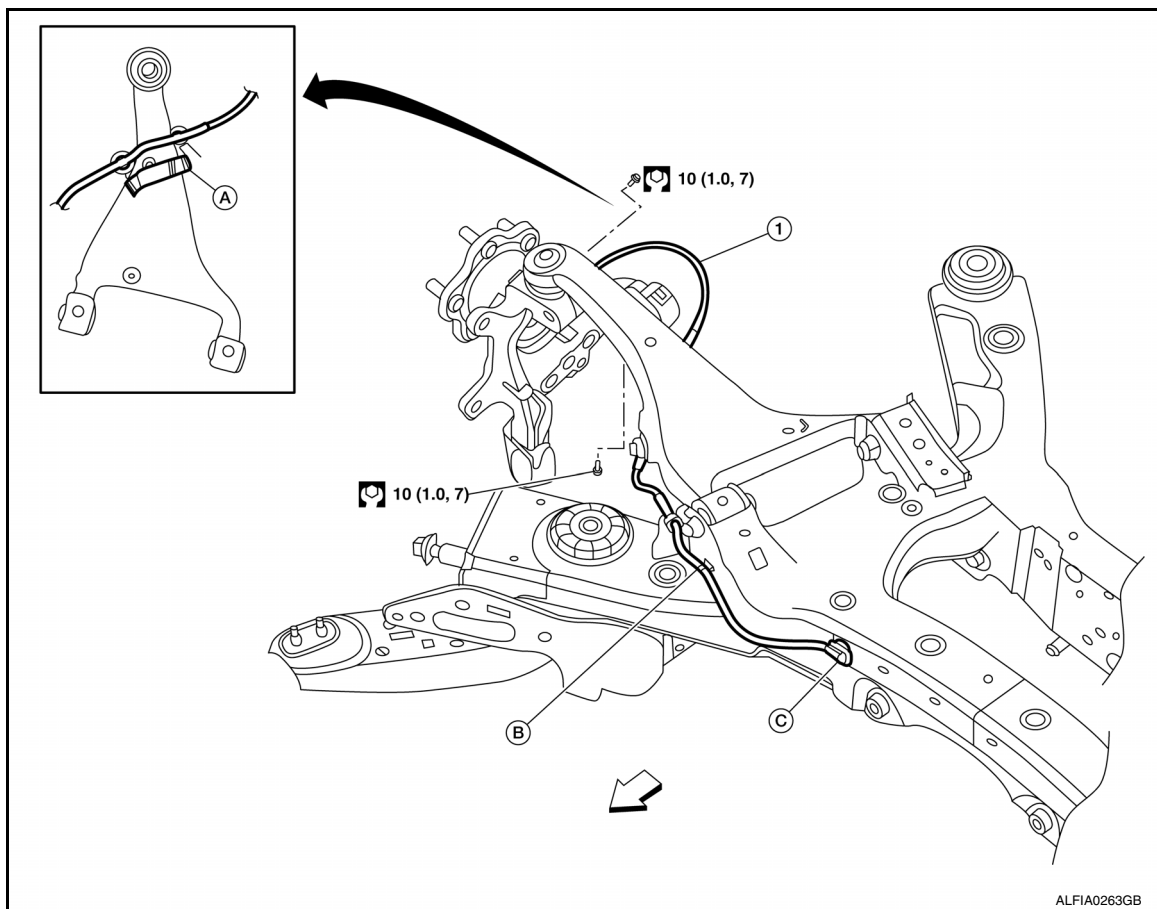
- When installing, make sure there is no foreign material such as iron chips on and in the hole in the steering knuckle for the front wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- Do not twist front wheel sensor harness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



Exploded View - Rear Wheel Sensor

INFOID:000000012551920

RH Side



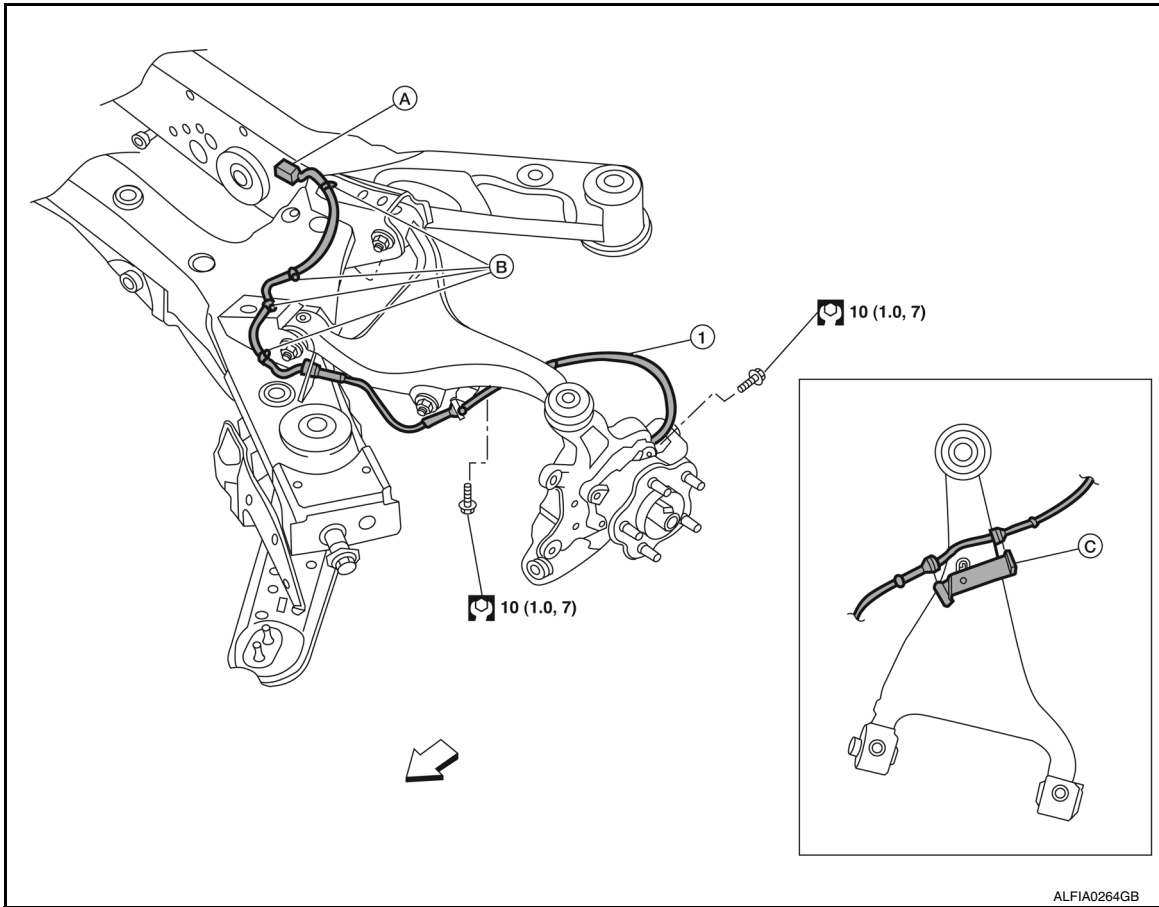
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|--------------------------------|------------------------------|---------|
| 1. Rear wheel sensor | A. Rear wheel sensor bracket | B. Clip |
| C. Rear wheel sensor connector | ↶ Front | |

WHEEL SENSOR

< UNIT REMOVAL AND INSTALLATION >

[TYPE 1]

LH Side



- | | | |
|------------------------------|--------------------------------|---------|
| 1. Rear wheel sensor | A. Rear wheel sensor connector | B. Clip |
| C. Rear wheel sensor bracket | ← Front | |

Removal and Installation - Rear Wheel Sensor

INFOID:000000012551921

CAUTION:

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

REMOVAL

1. Remove the rear wheel and tire using power tool. Refer to [WT-59. "Adjustment"](#).
2. Remove the rear wheel sensor bolt.
3. Disconnect the rear wheel sensor harness connector.
4. Remove the rear wheel sensor from the sensor brackets.
5. Remove the rear wheel sensor from the rear knuckle.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

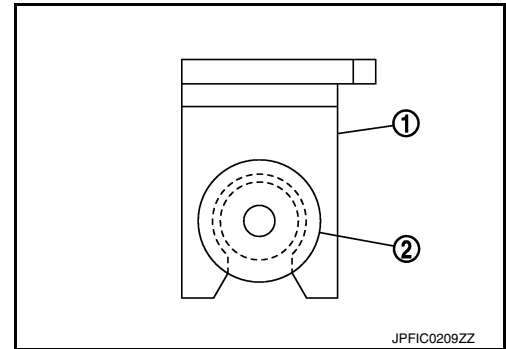
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WHEEL SENSOR

< UNIT REMOVAL AND INSTALLATION >

[TYPE 1]

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



SENSOR ROTOR

< UNIT REMOVAL AND INSTALLATION >

[TYPE 1]

SENSOR ROTOR

Removal and Installation - Front Sensor Rotor

INFOID:000000012551922

The front wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to [FAX-8, "Removal and Installation"](#).

Removal and Installation - Rear Sensor Rotor

INFOID:000000012551923

The rear wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to [RAX-7, "Removal and Installation"](#).

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

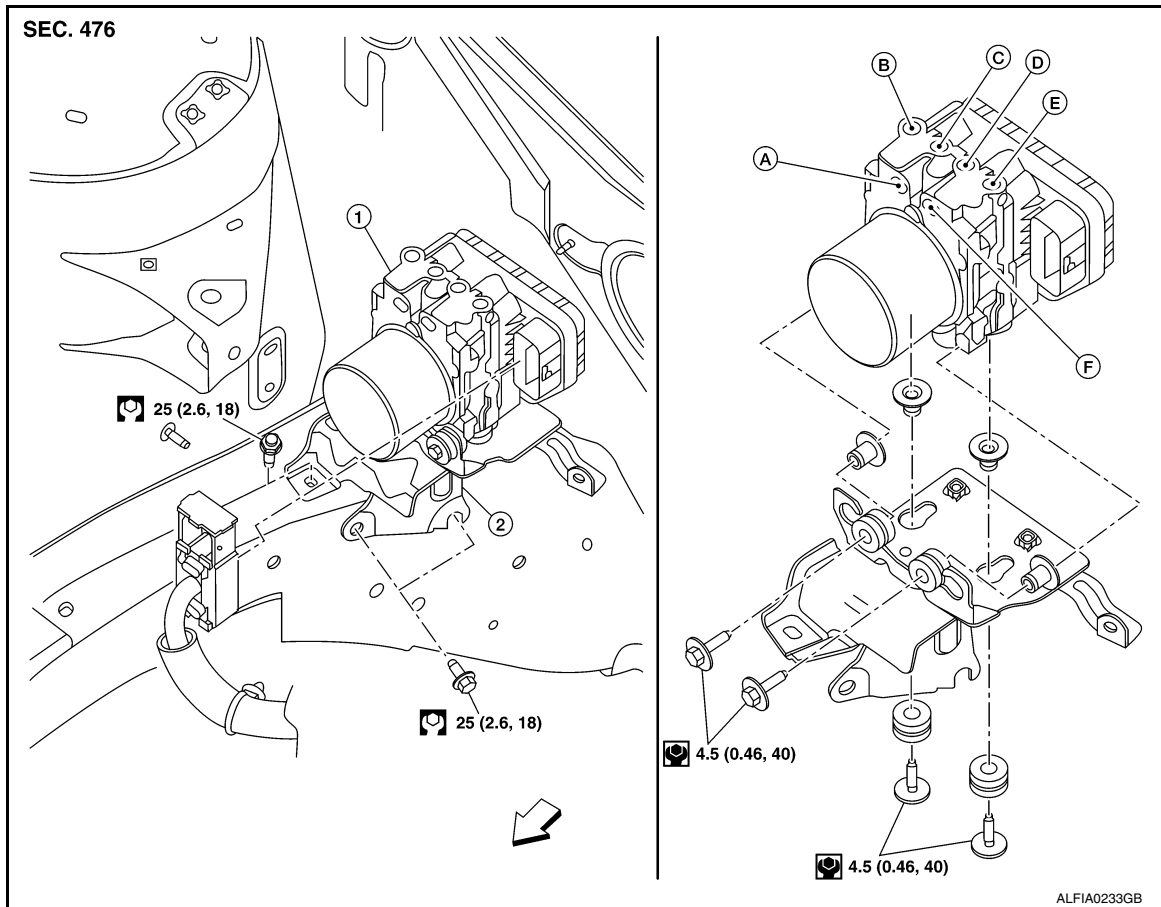
< UNIT REMOVAL AND INSTALLATION >

[TYPE 1]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000012551924



- | | | |
|--|--------------------------------------|--|
| 1. ABS actuator and electric unit (control unit) | 2. Bracket | A. From master cylinder secondary side |
| B. To front RH brake caliper | C. To rear LH brake caliper | D. To rear RH brake caliper |
| E. To front LH brake caliper | F. From master cylinder primary side | ⇐ Front |

Removal and Installation

INFOID:000000012551925

REMOVAL

CAUTION:

- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged.
- Do not remove actuator by holding harness.

NOTE:

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

1. Disconnect negative battery terminal. Refer to [PG-93, "Exploded View"](#).
2. Remove cowl top. Refer to [EXT-25, "Removal and Installation"](#).
3. Disconnect the harness connector from the ABS actuator and electric unit (control unit).
4. Separate brake tubes from ABS actuator and electric unit (control unit). Refer to [BR-22, "FRONT : Exploded View"](#).
5. Remove ABS actuator and electric unit (control unit) bracket bolts.
6. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< UNIT REMOVAL AND INSTALLATION >

[TYPE 1]

Installation is in the reverse order of removal.

- After work is completed, bleed air from brake tube. Refer to [BR-14, "Bleeding Brake System"](#).
- Adjust the neutral position of steering angle sensor. Refer to [BRC-62, "Description"](#).
- Perform calibration of the yaw rate/side/decel G sensor: Refer to [BRC-64, "Description"](#).

CAUTION:

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

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YAW RATE/SIDE/DECEL G SENSOR

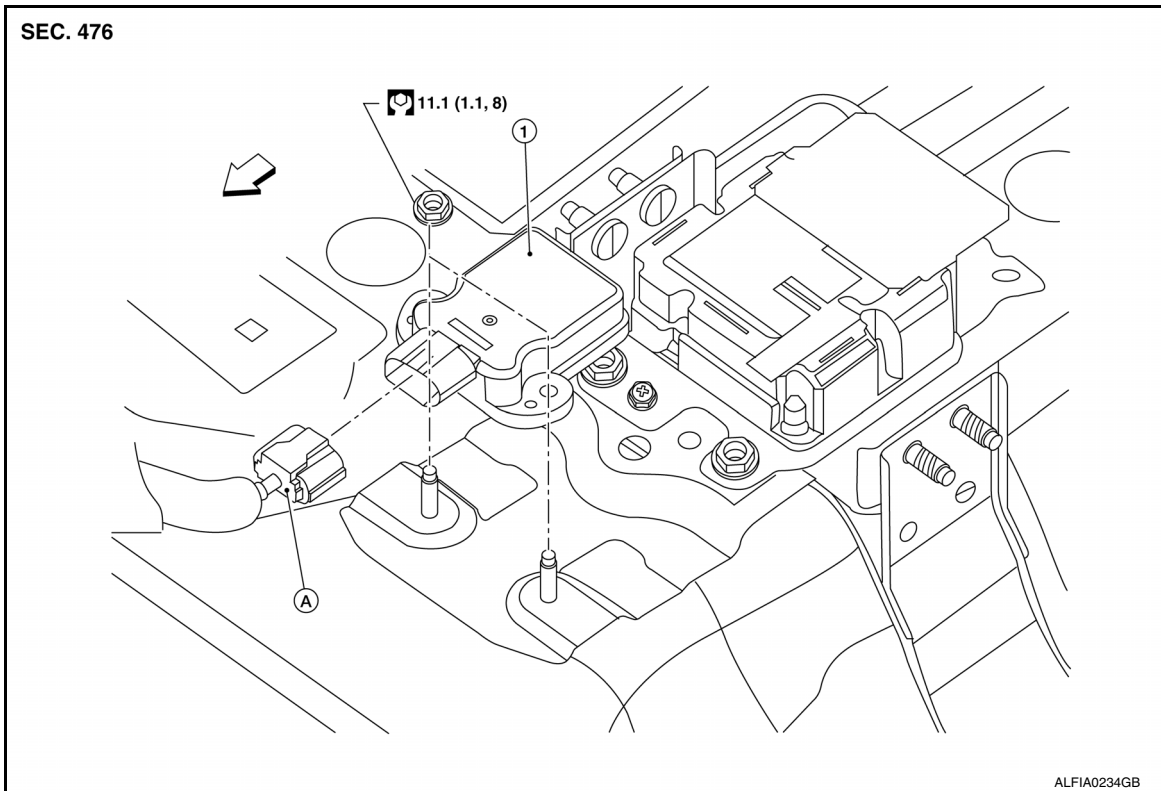
< UNIT REMOVAL AND INSTALLATION >

[TYPE 1]

YAW RATE/SIDE/DECEL G SENSOR

Exploded View

INFOID:000000012551926



1. Yaw rate/side/decel G sensor

A. Harness connector

← Front

Removal and Installation

INFOID:000000012551927

REMOVAL

1. Remove the side stay cover from the center console assembly. Refer to [IP-27, "Exploded View"](#).
2. Disconnect the harness connector from the yaw rate/side/decel G sensor.
3. Remove the yaw rate/side/decel G sensor nuts.
4. Remove yaw rate/side/decel G sensor.

INSTALLATION

Installation is in the reverse order of removal.

- Perform calibration of the yaw rate/side/decel G sensor. Refer to [BRC-64, "Description"](#).

CAUTION:

- Do not use power tools on the yaw rate/side/decel G sensor because it is sensitive to the impact.
- Replace the yaw rate/side/decel G sensor if it has been dropped or sustained impact.

VDC OFF SWITCH

< UNIT REMOVAL AND INSTALLATION >

[TYPE 1]

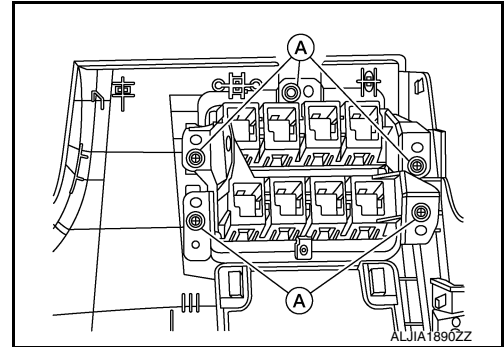
VDC OFF SWITCH

Removal and Installation


INFOID:000000012997323

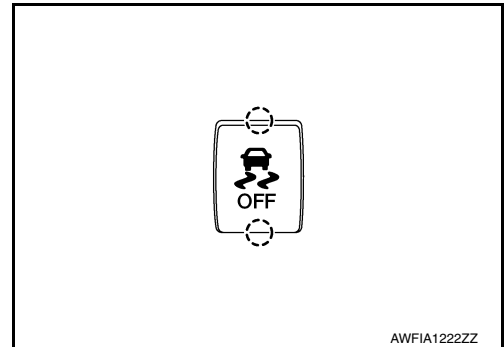
REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-15, "Removal and Installation"](#).
2. Disconnect harness connector from VDC OFF switch.
3. Remove screws (A), then remove switch carrier lower and switch carrier upper from instrument lower panel LH.



4. Using suitable tool, release pawls and remove VDC OFF switch.

 : Pawl



INSTALLATION

Installation is in the reverse order of removal.

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STEERING ANGLE SENSOR

< UNIT REMOVAL AND INSTALLATION >

[TYPE 1]

STEERING ANGLE SENSOR

Removal and Installation

INFOID:000000012551928

To remove and install the steering angle sensor, remove and install spiral cable. Refer to [SR-15. "Removal and Installation"](#).

PRECAUTION

PRECAUTIONS

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

INFOID:000000012551929

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

WARNING:

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

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

WARNING:

- When working near the 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 or batteries, and wait at least three minutes before performing any service.

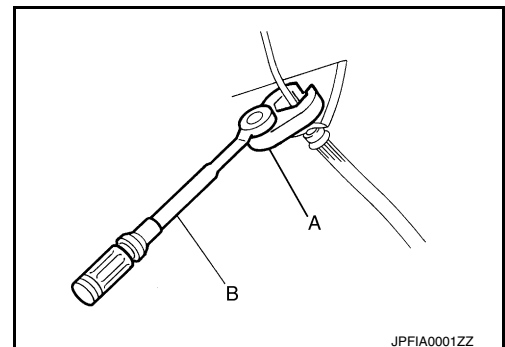
Precaution for Brake System

INFOID:000000012551930

WARNING:

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

- Brake fluid use refer to [MA-17. "FOR USA AND CANADA : Fluids and Lubricants"](#) (United States and Canada) or [MA-19. "FOR MEXICO : Fluids and Lubricants"](#) (Mexico).
- Do not reuse drained brake fluid.
- Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Always confirm the specified tightening torque when installing the brake pipes.
- After pressing the brake pedal more deeply or harder than normal driving, such as air bleeding, check each item of brake pedal. Adjust brake pedal if it is outside the standard value.
- Do not use mineral oils such as gasoline or light oil to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with a crow-foot (A) and torque wrench (B).
- Always connect the battery terminal when moving the vehicle.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.
- Check that no brake fluid leakage is present after replacing the parts.



PRECAUTIONS

< PRECAUTION >

[TYPE 2]

Precaution for Brake Control System

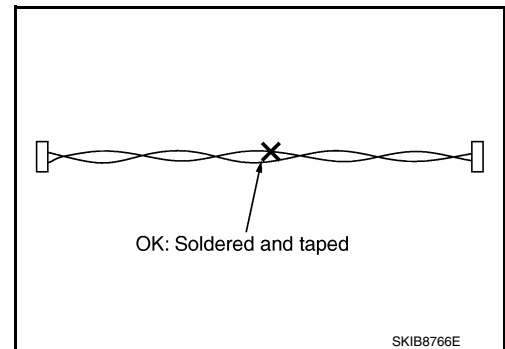
INFOID:000000012551931

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

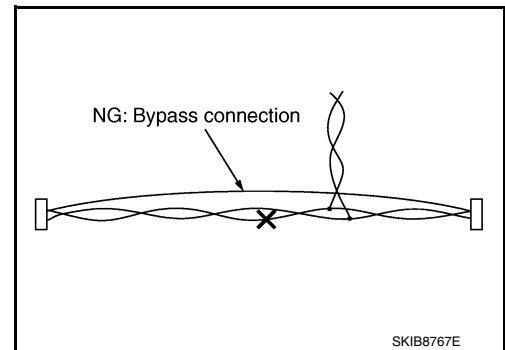
Precaution for Harness Repair

INFOID:000000012551932

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



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



PREPARATION

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[TYPE 2]

PREPARATION

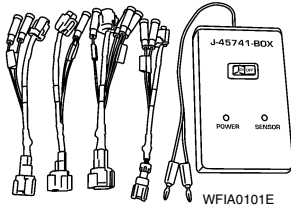
PREPARATION

Special Service Tool

INFOID:0000000012551933

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

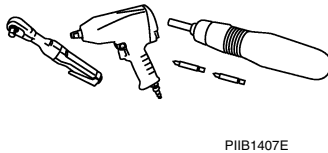
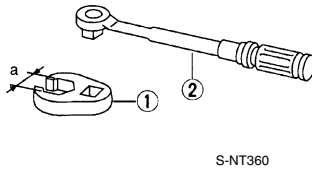
Tool number (TechMate No.) Tool name	Description
KV991J0080 (J-45741) ABS active wheel sensor tester	Checking operation of ABS active wheel sensors



Commercial Service Tools

INFOID:0000000012551934

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



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APPLICATION NOTICE

< SYSTEM DESCRIPTION >

[TYPE 2]

SYSTEM DESCRIPTION

APPLICATION NOTICE

Application Notice

INFOID:0000000012551935

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

COMPONENT PARTS

< SYSTEM DESCRIPTION >

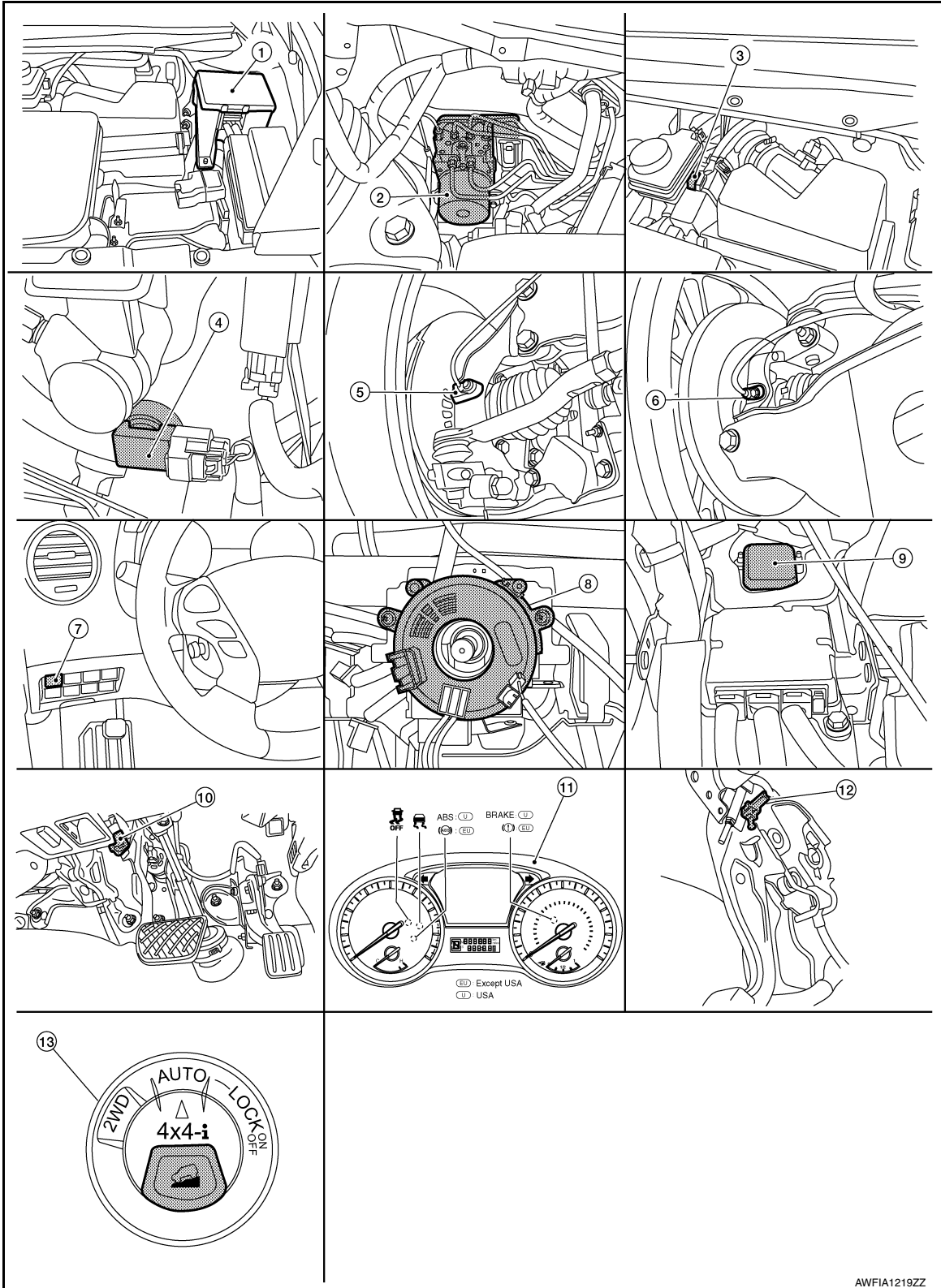
[TYPE 2]

COMPONENT PARTS

Component Parts Location

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AWFIA1219ZZ

COMPONENT PARTS

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[TYPE 2]

- | | | |
|--|--|--|
| 1. IPDM E/R | 2. ABS actuator and electric unit (control unit) | 3. Brake fluid level switch (part of brake fluid reservoir) |
| 4. Vacuum sensor (attached to lower side of brake booster) | 5. Front wheel sensor LH (RH similar) | 6. Rear wheel sensor LH (RH similar) |
| 7. VDC OFF switch | 8. Steering angle sensor (view with steering wheel and steering column covers removed) | 9. Yaw rate/side/decel G sensor (view with the center console removed) |
| 10. Stop lamp switch | 11. Combination meter | 12. Parking brake switch |
| 13. 4WD shift switch (hill descent control switch) | | |

Component Description

INFOID:0000000012551937

Component	Reference/Function	
ABS actuator and electric unit (control unit)	Pump/motor	BRC-170. "ABS Actuator and Electric Unit (Control Unit)"
	Motor relay	
	Actuator relay (main relay)	
	ABS IN valve	
	ABS OUT valve	
	Cut valve 1	
	Cut valve 2	
	Pressure sensor	
Wheel sensor	BRC-171. "Wheel Sensor and Sensor Rotor"	
Stop lamp switch	BRC-171. "Stop Lamp Switch"	
Steering angle sensor	BRC-171. "Steering Angle Sensor"	
Yaw rate/side/decel G sensor	BRC-171. "Yaw Rate/Side/Decel G Sensor"	
Vacuum sensor	BRC-172. "Vacuum Sensor"	
Brake fluid level switch	BRC-172. "Brake Fluid Level Switch"	
Hill descent control switch	BRC-298. "Description"	
Parking brake switch	BRC-172. "Parking Brake Switch"	
VDC OFF switch	BRC-172. "VDC OFF Switch"	
ECM	<p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> Accelerator pedal position signal Engine speed signal <p>Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> Target throttle position signal 	
TCM	<p>Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication.</p> <ul style="list-style-type: none"> Shift position signal Current gear position signal 	
ABS warning lamp	BRC-173. "System Description"	
Brake warning lamp		
VDC OFF indicator lamp		
SLIP indicator lamp		
Hill descent control indicator lamp	BRC-305. "Description"	

ABS Actuator and Electric Unit (Control Unit)

INFOID:0000000012551938

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

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[TYPE 2]

ELECTRIC UNIT (CONTROL UNIT)

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

ACTUATOR

The following components are integrated with ABS actuator.

Pump

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

Motor

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

Motor Relay

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

Actuator Relay

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

ABS IN Valve and ABS OUT Valve

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

Pressure Sensor

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

Cut Valve 1 (Primary Line), Cut Valve 2 (Secondary Line)

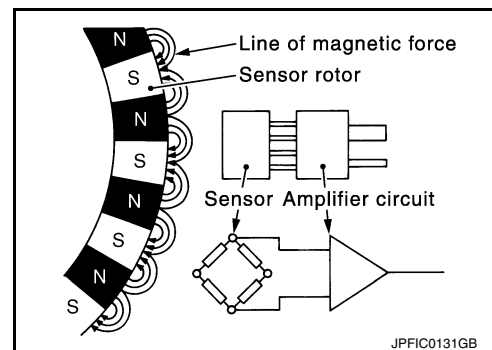
Shuts off the ordinary brake line from master cylinder when VDC function, TCS function and hill start assist function are activated.

Wheel Sensor and Sensor Rotor

INFOID:000000012551939

NOTE:

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



Stop Lamp Switch

INFOID:000000012551940

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

Steering Angle Sensor

INFOID:000000012551941

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

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

Yaw Rate/Side/Decel G Sensor

INFOID:000000012551942

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

- Vehicle rotation angular velocity (yaw rate signal)

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

[TYPE 2]

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

Brake Fluid Level Switch

INFOID:0000000012551943

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

Vacuum Sensor

INFOID:0000000012551944

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

Parking Brake Switch

INFOID:0000000012551945

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

VDC OFF Switch

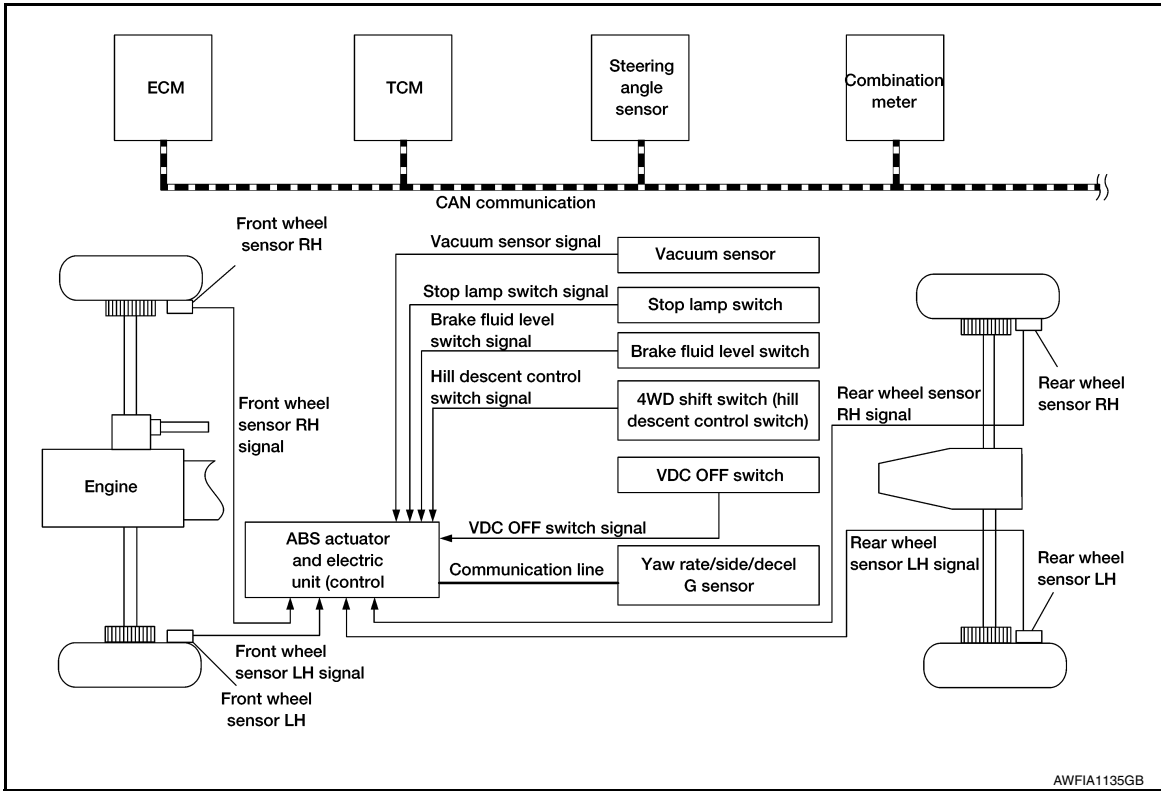
INFOID:0000000012551946

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

SYSTEM

System Diagram

INFOID:000000012551947



AWFIA1135GB

System Description

INFOID:000000012551948

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

INPUT SIGNAL AND OUTPUT SIGNAL

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

VDC function, TCS function, ABS function and EBD function

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

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SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

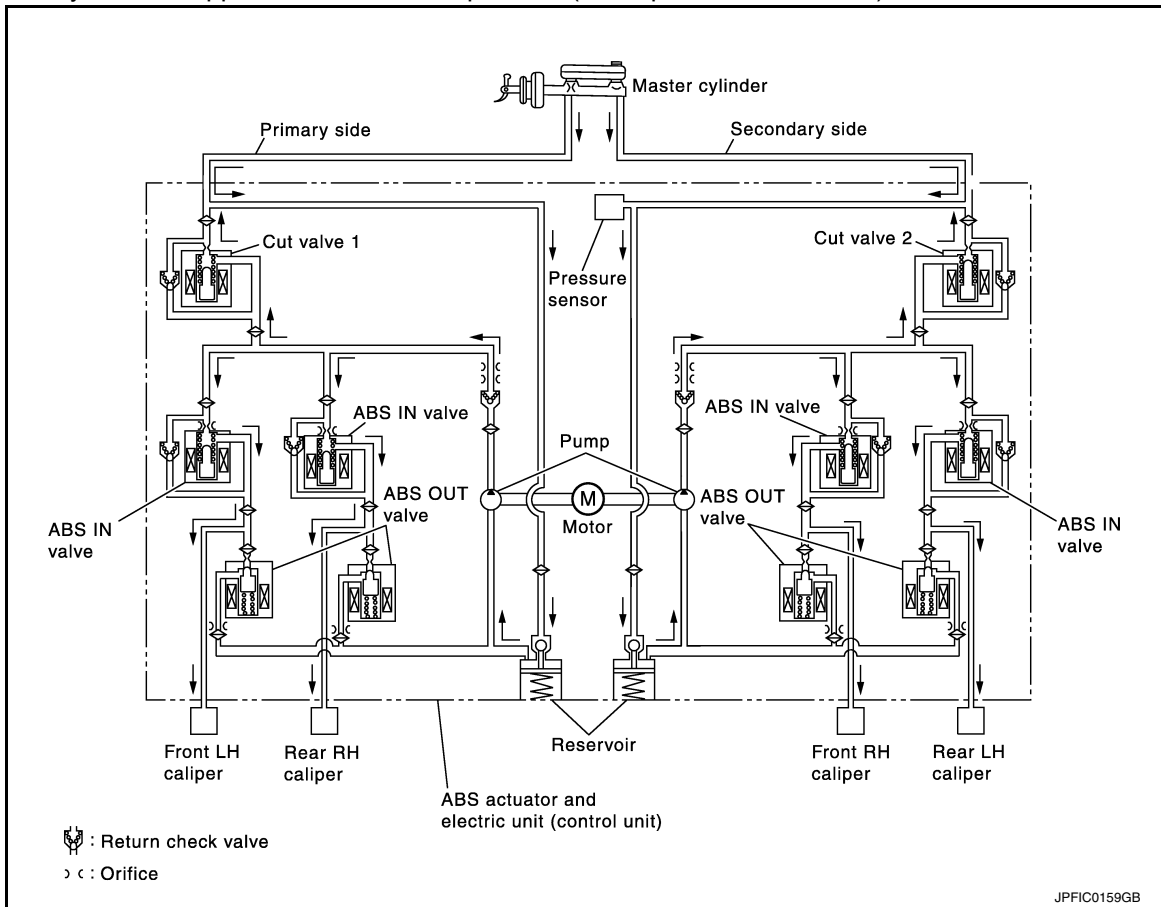
Component	Signal description
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication. <ul style="list-style-type: none"> • Steering angle sensor signal
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • ABS warning lamp signal • Brake warning lamp signal • VDC warning lamp signal • VDC OFF indicator lamp • Hill descent control indicator lamp

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

VALVE OPERATION (ABS AND EBD)

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

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



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

SYSTEM

[TYPE 2]

< SYSTEM DESCRIPTION >

When front RH wheel caliper pressure increases

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

When front LH wheel caliper pressure increases

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

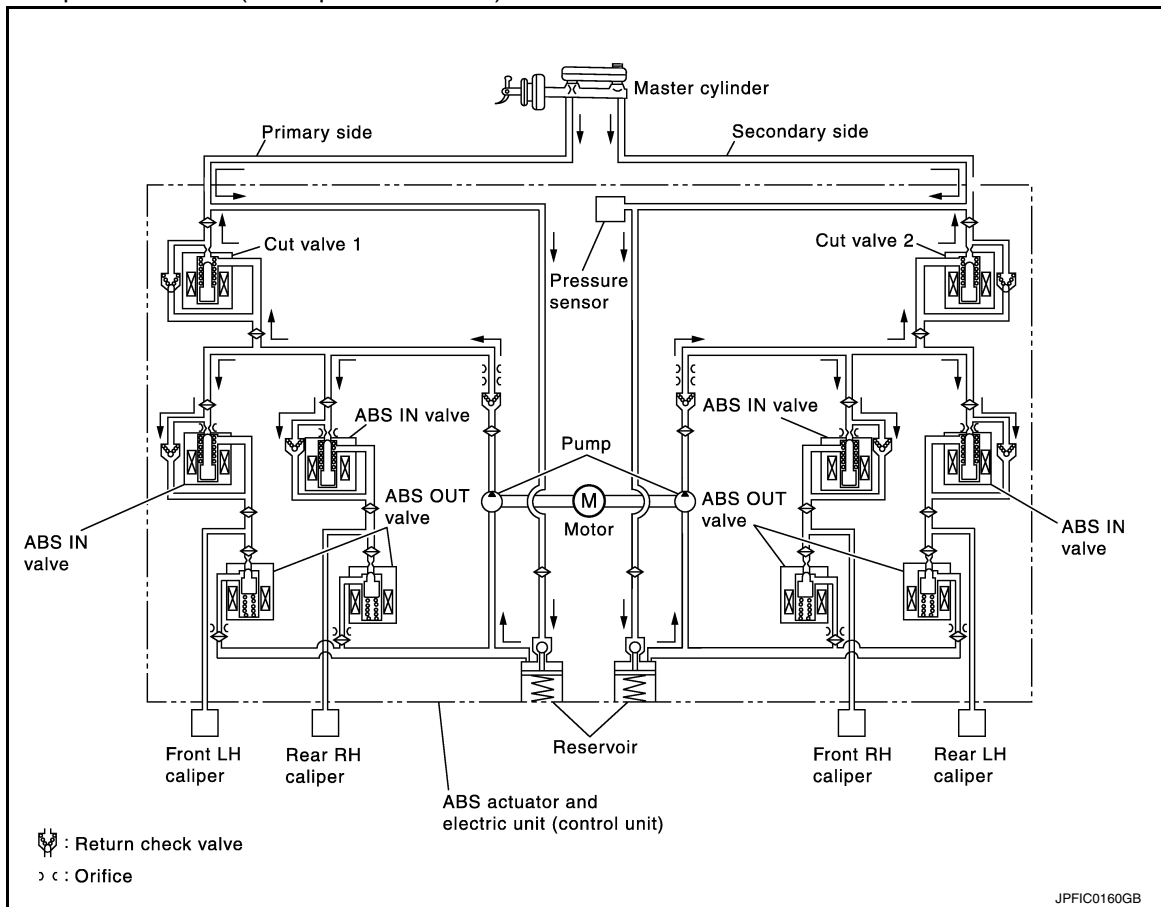
When rear RH wheel caliper pressure increases

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

When rear LH wheel caliper pressure increases

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

When ABS operation starts (when pressure holds)



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

When front RH wheel caliper pressure holds

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

When front LH wheel caliper pressure holds

SYSTEM

[TYPE 2]

< SYSTEM DESCRIPTION >

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

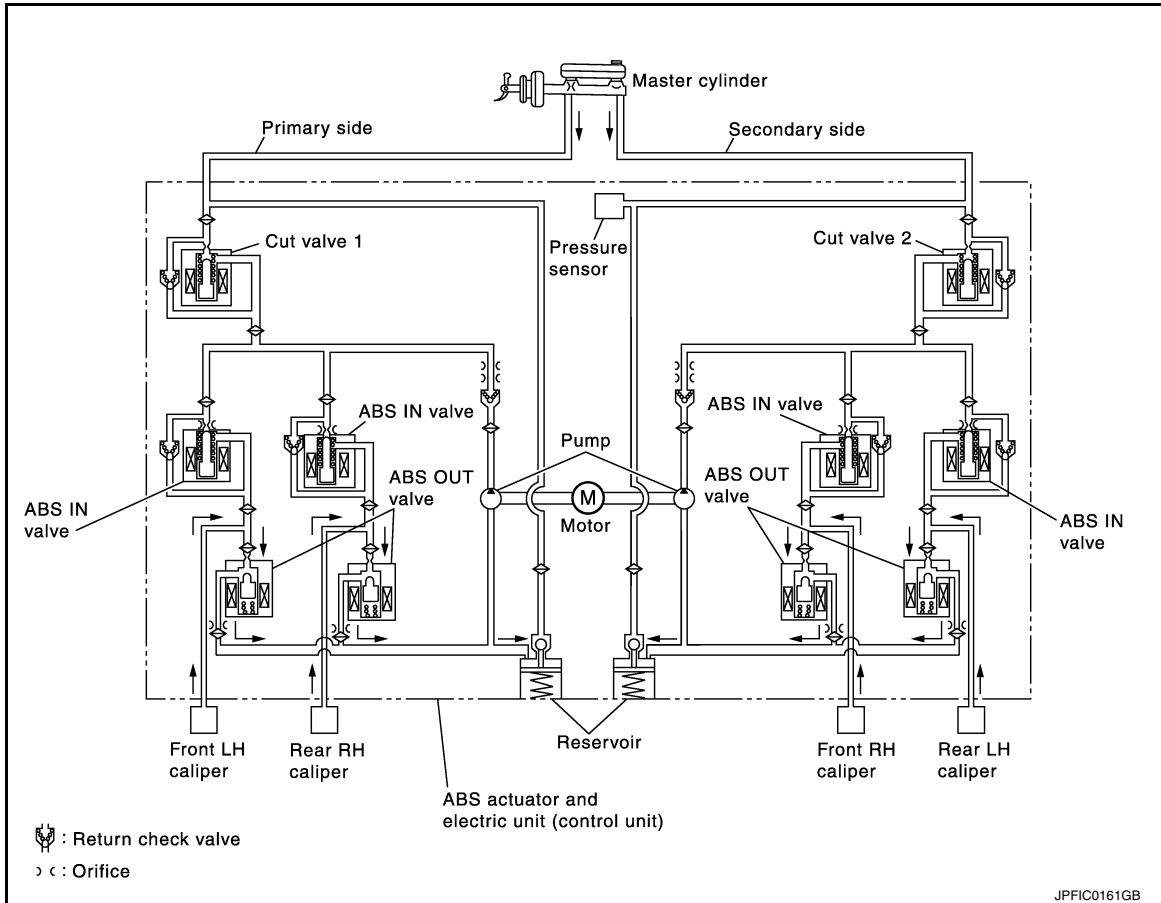
When rear RH wheel caliper pressure holds

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

When rear LH wheel caliper pressure holds

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

ABS is in operation (when pressure decreases)



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

When front RH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When front LH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When rear RH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

When rear LH wheel caliper pressure decreases

- Being supplied to reservoir through ABS OUT valve, the fluid pressure of brake caliper is decreased.

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

Component Parts and Function

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

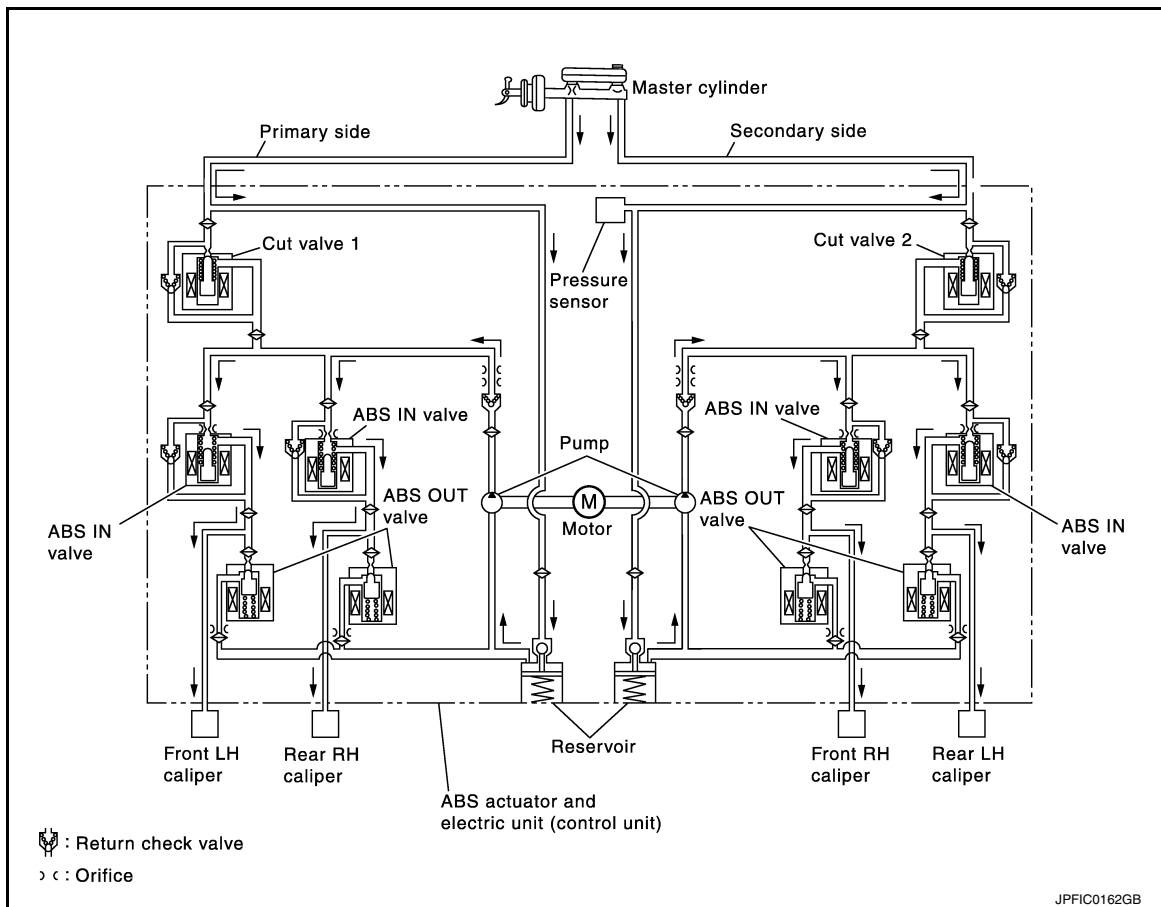
VALVE OPERATION (OTHER THAN ABS AND EBD)

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

NOTE:

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

When Pressure Increases



SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

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

When front RH wheel caliper pressure increases

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

When front LH wheel caliper pressure increases

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

When rear RH wheel caliper pressure increases

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

When rear LH wheel caliper pressure increases

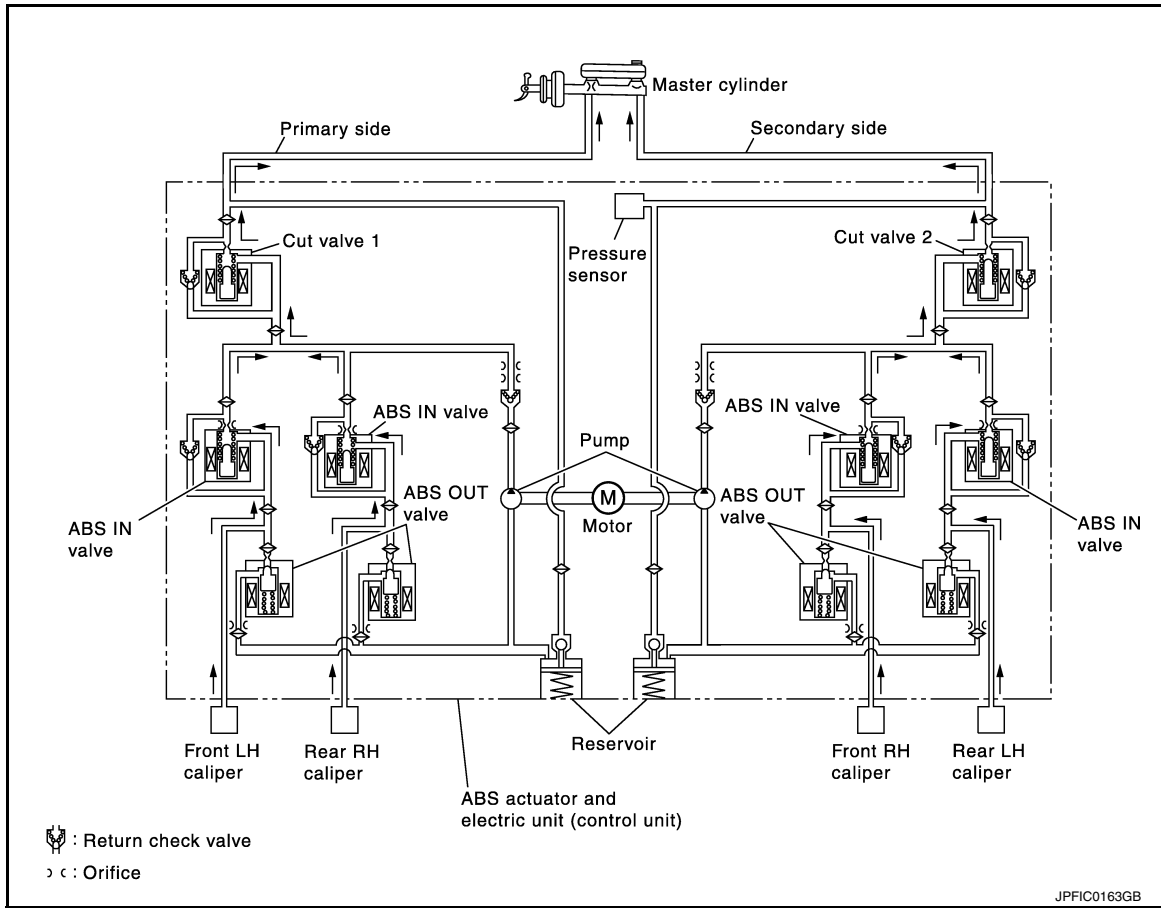
- Motor is activated. Brake fluid from pump is supplied to front LH wheel caliper through ABS IN valve. For other wheel, ABS IN valve is closed and brakes fluid is not supplied to caliper.

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

Released



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

When front RH wheel caliper pressure decreases

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

When front LH wheel caliper pressure decreases

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

When rear RH wheel caliper pressure decreases

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

When rear LH wheel caliper pressure decreases

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

Component Parts and Function

Component	Function
Reservoir	Temporarily reserves the brake fluid drained from brake caliper so that pressure efficiently decreases when decreasing pressure of brake caliper.
Pump	Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.
Motor	Drives the pump according to signals from control unit.
ABS IN valve	Switches the fluid pressure line to increase or hold according to signals from control unit.

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

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

CONDITIONS FOR TURNING ON THE WARNING LAMP

ABS Warning Lamp

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

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

Brake Warning Lamp

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

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

VDC Warning Lamp

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

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

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

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

CONDITIONS FOR TURNING ON THE INDICATOR LAMP

VDC OFF indicator lamp

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

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

Hill descent control indicator lamp

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

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

Fail-Safe

INFOID:0000000012551949

VDC FUNCTION, TCS FUNCTION and hill start assist FUNCTION

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

ABS FUNCTION

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

NOTE:

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

EBD FUNCTION

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

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

DTC	Malfunction detected condition	Fail-safe condition
C1101	When an open circuit is detected in rear RH wheel sensor circuit.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function (only when both 2 rear wheels are malfunctioning) • hill start assist function
C1102	When an open circuit is detected in rear LH wheel sensor circuit.	
C1103	When an open circuit is detected in front RH wheel sensor circuit.	
C1104	When an open circuit is detected in front LH wheel sensor circuit.	
C1105	<ul style="list-style-type: none"> • When power supply voltage of rear RH wheel sensor is low. • When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. • When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. 	
C1106	<ul style="list-style-type: none"> • When power supply voltage of rear LH wheel sensor is low. • When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. • When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. 	
C1107	<ul style="list-style-type: none"> • When power supply voltage of front RH wheel sensor is low. • When distance between front RH wheel sensor and front RH wheel sensor rotor is large. • When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. 	
C1108	<ul style="list-style-type: none"> • When power supply voltage of front LH wheel sensor is low. • When distance between front LH wheel sensor and front LH wheel sensor rotor is large. • When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. 	
C1109	<ul style="list-style-type: none"> • When ignition voltage is 10 V or less. • When ignition voltage is 16 V or more. 	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1111	When a malfunction is detected in motor or motor relay.	
C1115	When difference in wheel speed between any wheel and others is detected during the vehicle is driven, because of installation of other tires than specified.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • hill start assist function
C1116	When stop lamp switch signal is not input when brake pedal operates.	
C1120	When a malfunction is detected in front LH ABS IN valve.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1121	When a malfunction is detected in front LH ABS OUT valve.	
C1122	When a malfunction is detected in front RH ABS IN valve.	
C1123	When a malfunction is detected in front RH ABS OUT valve.	
C1124	When a malfunction is detected in rear LH ABS IN valve.	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	
C1126	When a malfunction is detected in rear RH ABS IN valve.	
C1127	When a malfunction is detected in rear RH ABS OUT valve.	
C1130	When a malfunction is detected in ECM system.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

DTC	Malfunction detected condition	Fail-safe condition
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1142	When a malfunction is detected in pressure sensor.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function
C1143	When a malfunction is detected in steering angle sensor.	
C1144	When neutral position adjustment of steering angle sensor is not complete.	
C1145	When a malfunction is detected in yaw rate signal.	
C1146	When a malfunction is detected in side/decel G signal.	
C1155	When brake fluid level low signal is detected.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • hill start assist function
C1160	When calibration of yaw rate/side/decel G sensor is not complete.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function
C1164	When a malfunction is detected in cut valve 1.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1165	When a malfunction is detected in cut valve 2.	
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1197	When a malfunction is detected in vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.
C1198	<ul style="list-style-type: none"> • When an open circuit is detected in vacuum sensor circuit. • When a short circuit is detected in vacuum sensor circuit. • When a malfunction is detected in vacuum sensor noise. 	
C1199	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.	
C119A	When a malfunction is detected in supply power voltage of vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.
U1000	When CAN communication signal is not continuously received for 2 seconds or more.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function

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VDC FUNCTION

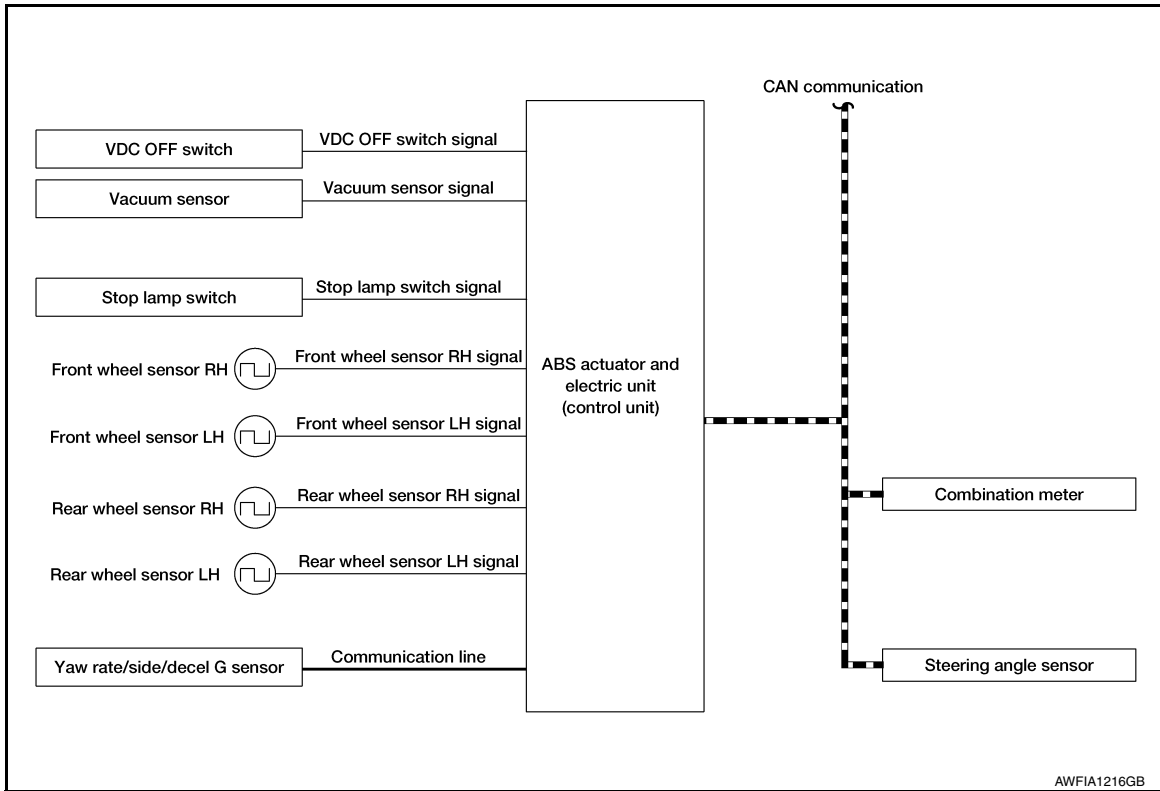
SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

VDC FUNCTION : System Diagram

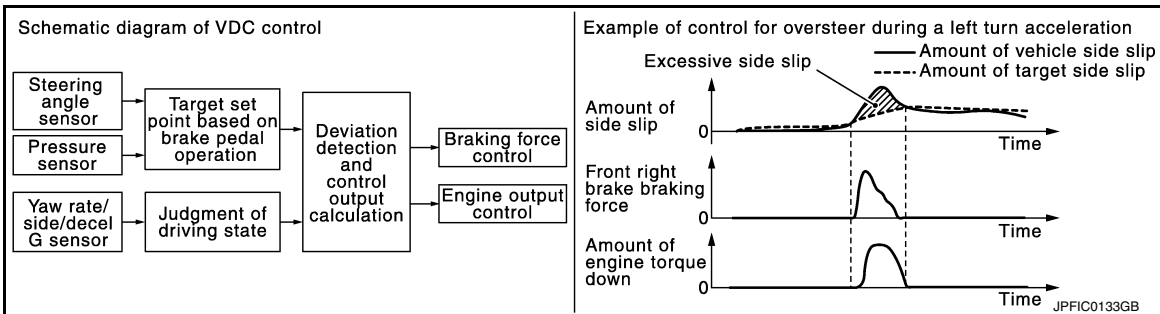
INFOID:000000012551950



VDC FUNCTION : System Description

INFOID:000000012551951

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



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

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

- switch.] VDC warning lamp turns ON when Brake limited slip differential (BLSD) function is in operation. Noises and vibration may be generated due to brake operation. This is not a malfunction.
- CONSULT can be used to diagnose the system.
- Fail-safe function is adopted. When a malfunction occurs in VDC function, the control is suspended for VDC function, TCS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-181, "Fail-Safe"](#).

NOTE:

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

INPUT SIGNAL AND OUTPUT SIGNAL

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

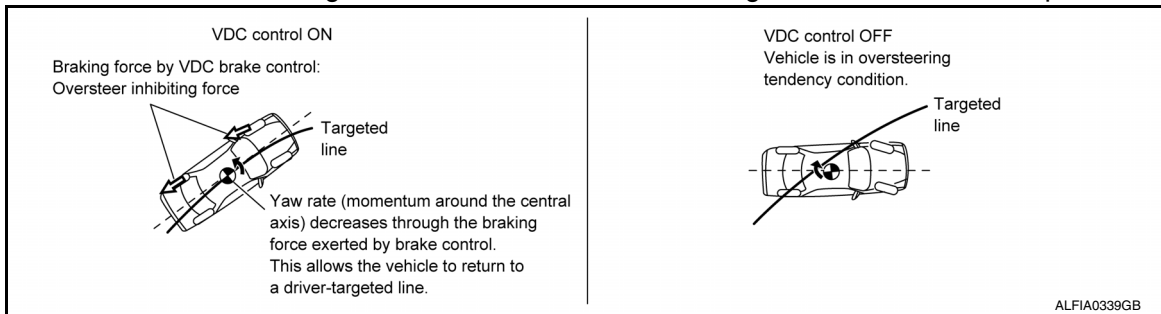
Component	Signal description
Yaw rate/side/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line*1: <ul style="list-style-type: none"> • Yaw rate signal • Side G sensor signal • Decel G sensor signal
ECM	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Acceleration pedal position signal • Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Target throttle position signal
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Shift position signal
Steering angle sensor	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal

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

OPERATION CHARACTERISTICS

VDC Function That Prevents Oversteer Tendency

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

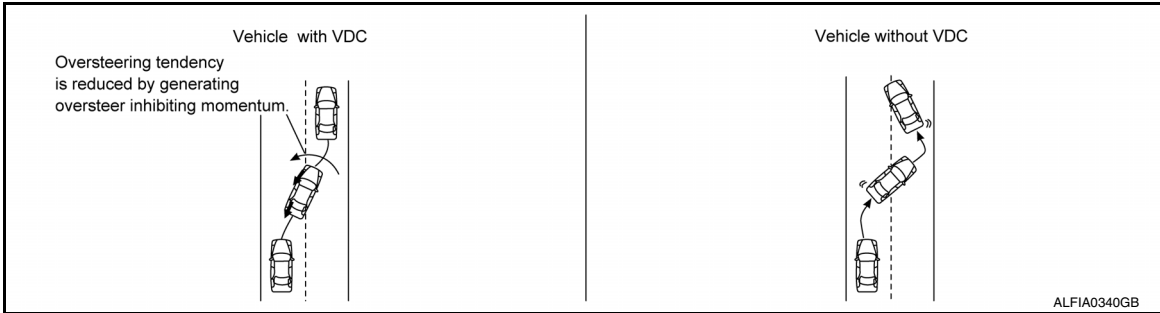


SYSTEM

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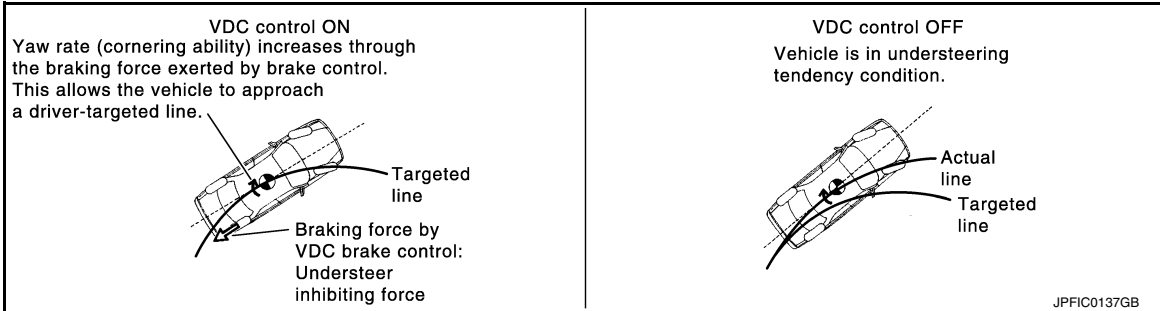
[TYPE 2]

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

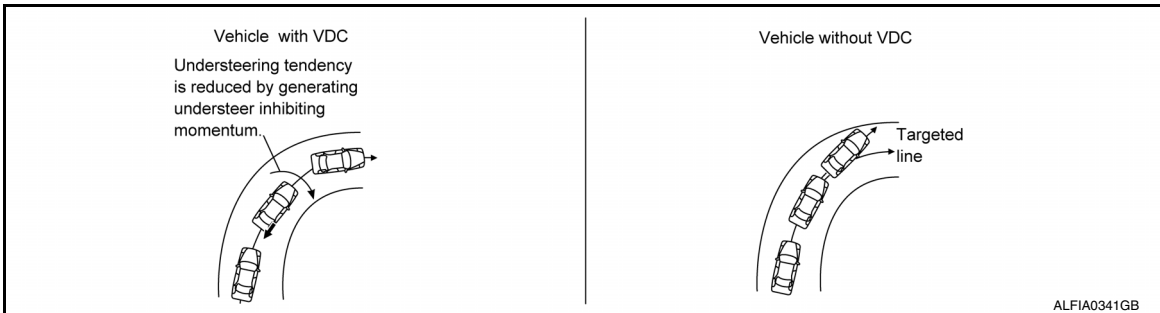


VDC Function That Prevents Understeer Tendency

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



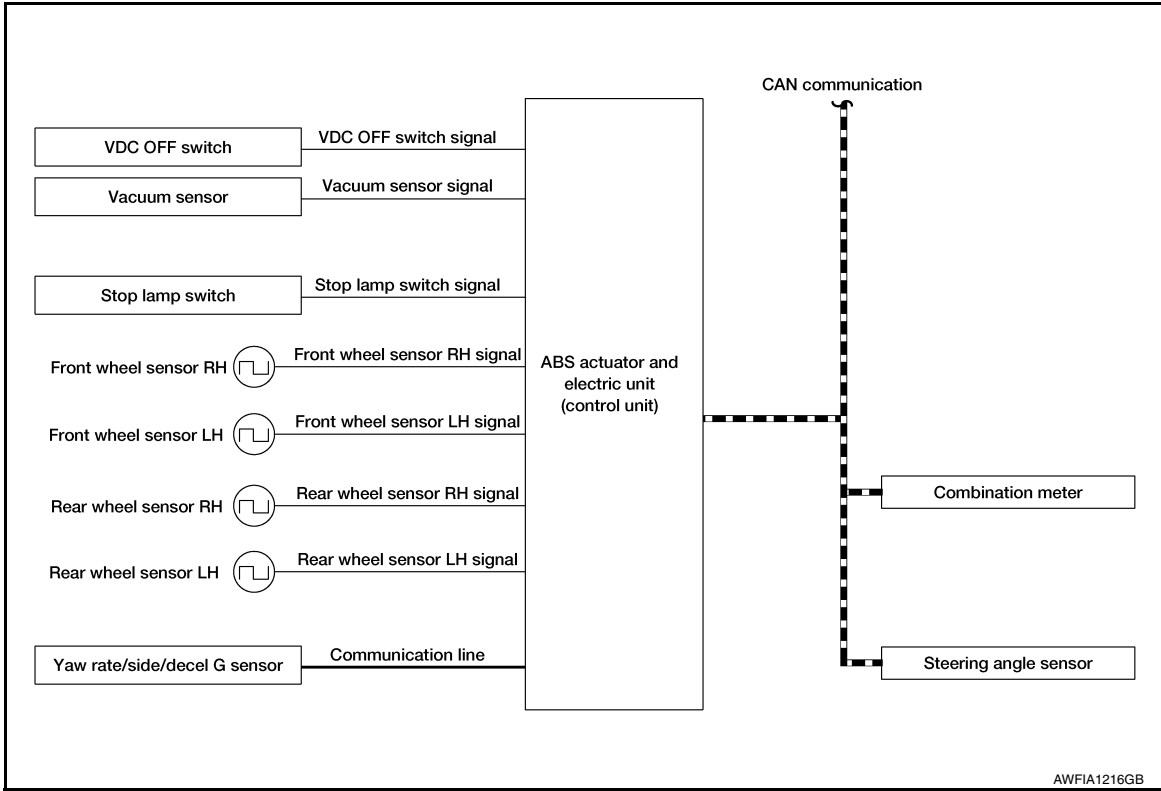
- Applying braking during cornering on a slippery road, when understeer tendency is judged large, engine output is controlled as well as brake force (brake fluid pressure) of four wheels. Understeer tendency decreases.



TCS FUNCTION

TCS FUNCTION : System Diagram

INFOID:000000012551952



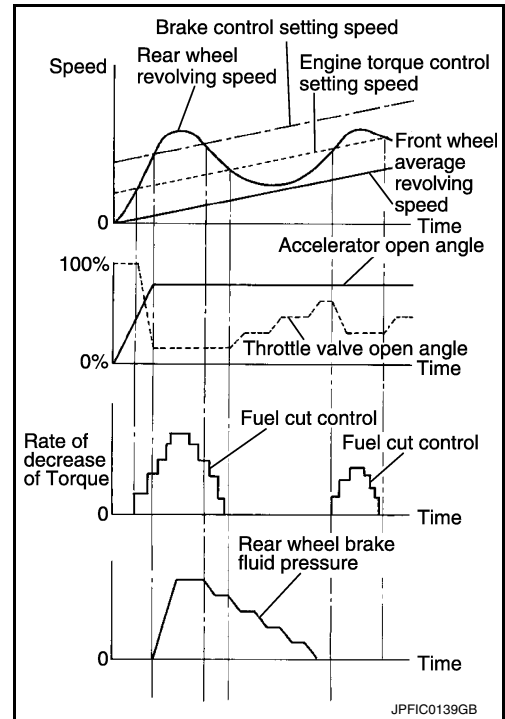
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TCS FUNCTION : System Description

INFOID:000000012551953

- Wheel spin status of drive wheel is detected by wheel sensor of 4 wheels. Engine output and transmission shift status is controlled so that slip rate of drive wheels is at an appropriate level. When wheel spin occurs on drive wheel, ABS actuator and electric unit (control unit) perform brake force control of LH and RH drive wheels (apply brake force by increasing brake fluid pressure of drive wheel) and decrease engine torque by engine torque control. Wheel spin amount decreases. Engine torque is controlled to appropriate level.
- TCS function can be switched to non-operational status (OFF) by operating VDC OFF switch. In this case, VDC OFF indicator lamp turns ON.
- VDC warning lamp blinks while TCS function is in operation and indicates to the driver that the function is in operation.
- CONSULT can be used to diagnose the system.
- Fail-safe function is adopted. When a malfunction occurs in TCS function, the control is suspended for VDC function, TCS function, and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-181, "Fail-Safe"](#).



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INPUT SIGNAL AND OUTPUT SIGNAL

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

SYSTEM

< SYSTEM DESCRIPTION >

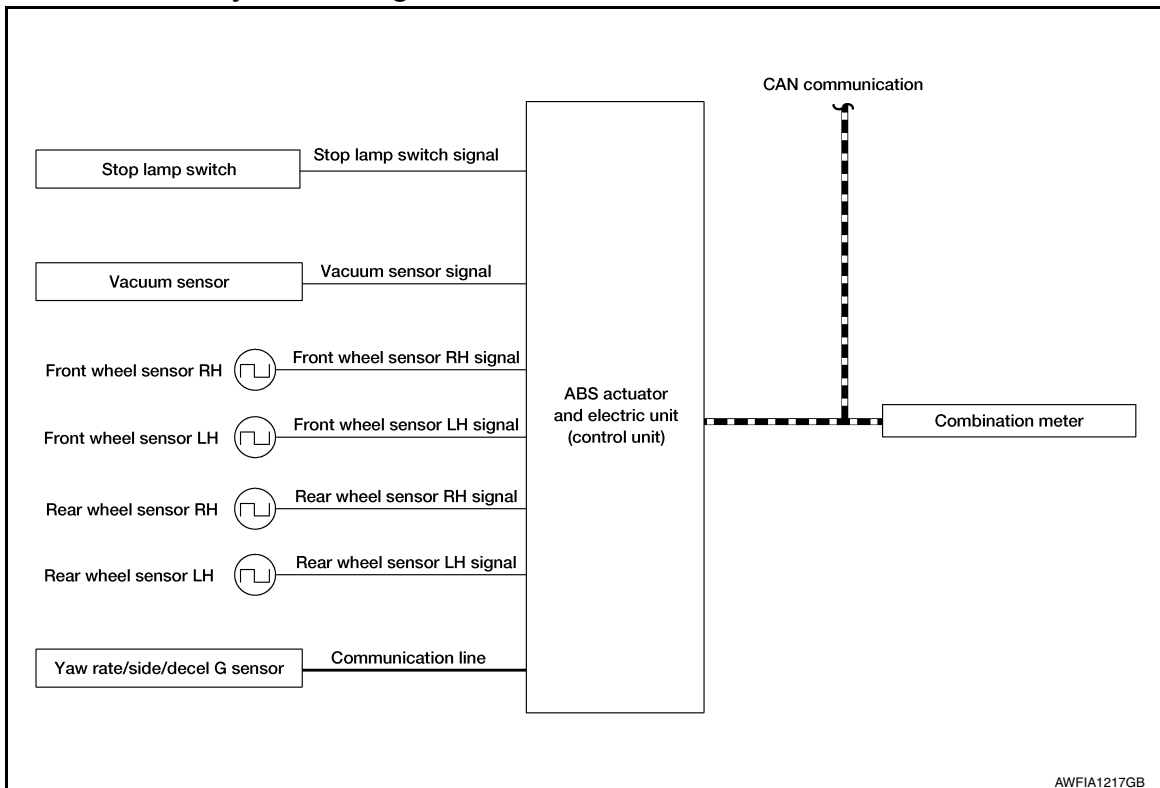
[TYPE 2]

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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Target throttle position signal
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Shift position signal
Steering angle sensor	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal

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

ABS FUNCTION : System Diagram

INFOID:0000000012551954



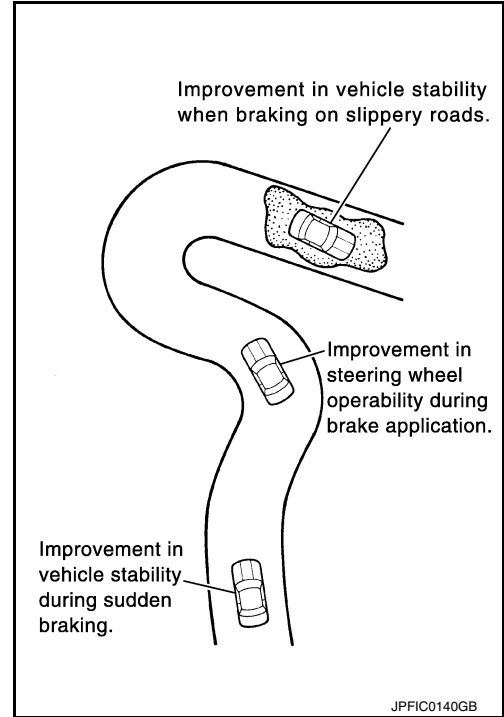
ABS FUNCTION : System Description

INFOID:000000012551955

- By preventing wheel lock through brake force (brake fluid pressure) control that is electronically controlled by detecting wheel speed during braking, stability during emergency braking is improved so that obstacles can be avoided by steering operation.
- During braking, control unit calculates wheel speed and pseudo-vehicle speed, and transmits pressure increase, hold or decrease signals to actuator portion according to wheel slip status.
- The following effects are obtained by preventing wheel lock during braking.
 - Vehicle tail slip is prevented during braking when driving straight.
 - Understeer and oversteer tendencies are moderated during braking driving on a corner.
 - Obstacles may be easily bypassed by steering operation during braking.
- CONSULT can be used to diagnose the system diagnosis.
- Fail-safe function is adopted. When a malfunction occurs in ABS function, the control is suspended for VDC function, TCS function, ABS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function and hill start assist function. However, EBD function is operated normally. Refer to [BRC-181. "Fail-Safe"](#).

NOTE:

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



INPUT SIGNAL AND OUTPUT SIGNAL

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

Component	Signal description
Steering angle sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Steering angle sensor signal
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • ABS warning lamp signal • VDC warning lamp signal

EBD FUNCTION

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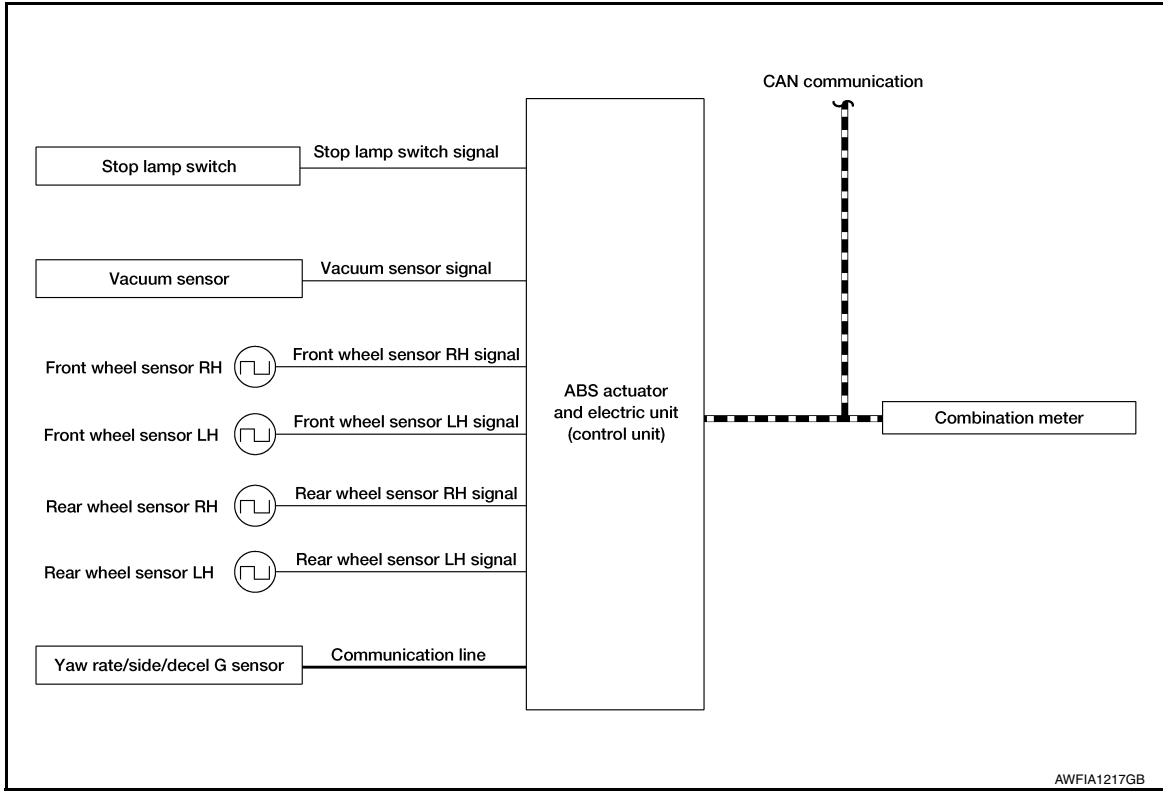
SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

EBD FUNCTION : System Diagram

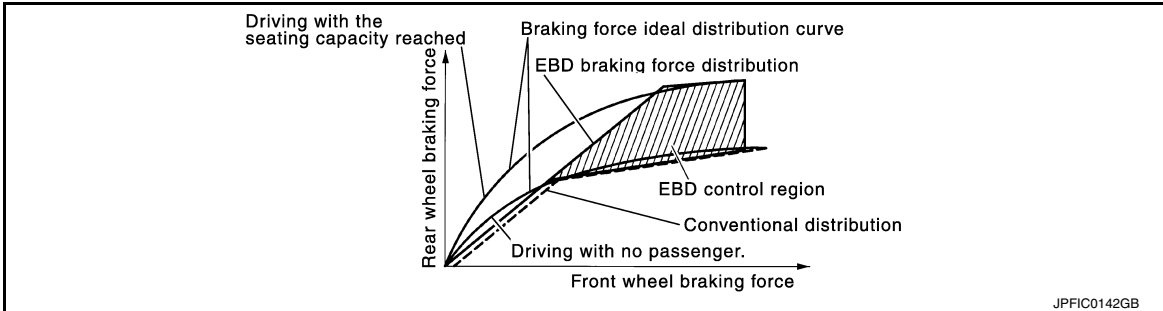
INFOID:000000012551956



EBD FUNCTION : System Description

INFOID:000000012551957

- 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).

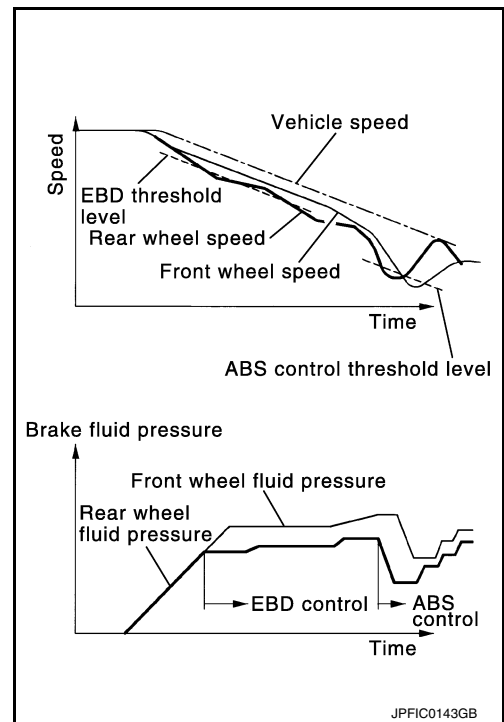


SYSTEM

[TYPE 2]

< SYSTEM DESCRIPTION >

- During braking, control unit portion compares slight slip on front and rear wheels by wheel speed sensor signal, transmits drive signal to actuator portion when rear wheel slip exceeds front wheel slip for the specified value or more, and controls rear wheel brake force (brake fluid pressure) so that increase of rear wheel slip is prevented and slips on front wheel and rear wheel are nearly equalized. ABS control is applied when slip on each wheel increases and wheel speed is the threshold value of ABS control or less.
- CONSULT can be used to diagnose the system.
- Fail-safe function is adopted. When a malfunction occurs in EBD function, the control is suspended for VDC function, TCS function, ABS function, EBD function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function, ABS function, EBD function and hill start assist function. Refer to [BRC-181. "Fail-Safe"](#).



INPUT SIGNAL AND OUTPUT SIGNAL

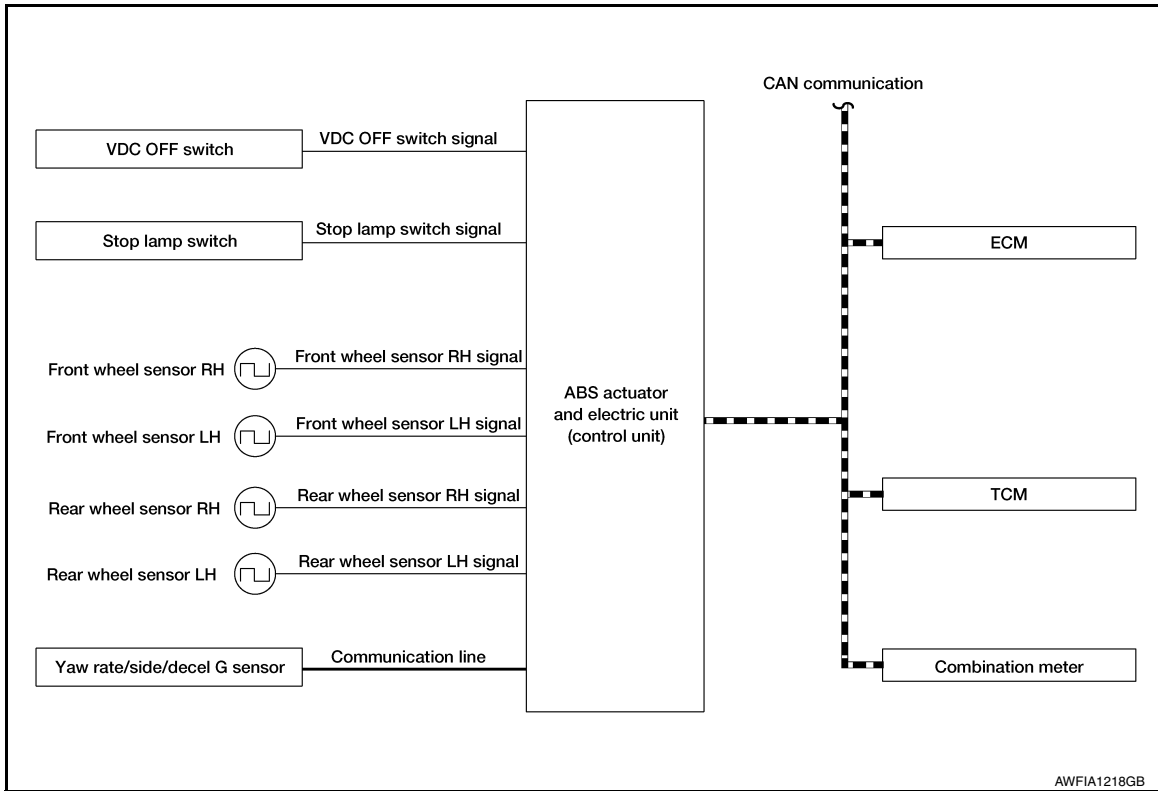
Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
Combination meter	Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake warning lamp signal • ABS warning lamp signal • VDC warning lamp signal

Hill start assist FUNCTION

Hill start assist FUNCTION : System Diagram

INFOID:000000012551958



Hill start assist FUNCTION : System Description

INFOID:000000012551959

- This function maintains brake fluid pressure so that the vehicle does not move backwards, even if brake pedal is released to depress accelerator pedal to start the vehicle, while it is stopped on an uphill slope by depressing brake pedal.
- This function operates when the vehicle is in stop status on an uphill slope of slope ratio 10% or more and selector lever is in any position other than P (Park) or N (Neutral).
- Hill start assist function is only for the start aid. It maintains the brake fluid pressure for approx. 2 seconds after releasing the brake pedal, and then decreases the pressure gradually. If the vehicle starts by accelerator operation, the brake is released automatically and a smooth start is performed.
- Fail-safe function is adopted. When a malfunction occurs in hill start assist function, the control is suspended for VDC function, TCS function and hill start assist function. The vehicle status becomes the same as models without VDC function, TCS function and hill start assist function. However, ABS function and EBD function are operated normally. Refer to [BRC-181, "Fail-Safe"](#).

INPUT SIGNAL AND OUTPUT SIGNAL

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

Component	Signal description
Yaw rate/side/decel G sensor	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via communication line *: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Accelerator pedal position signal • Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Target throttle position signal

SYSTEM

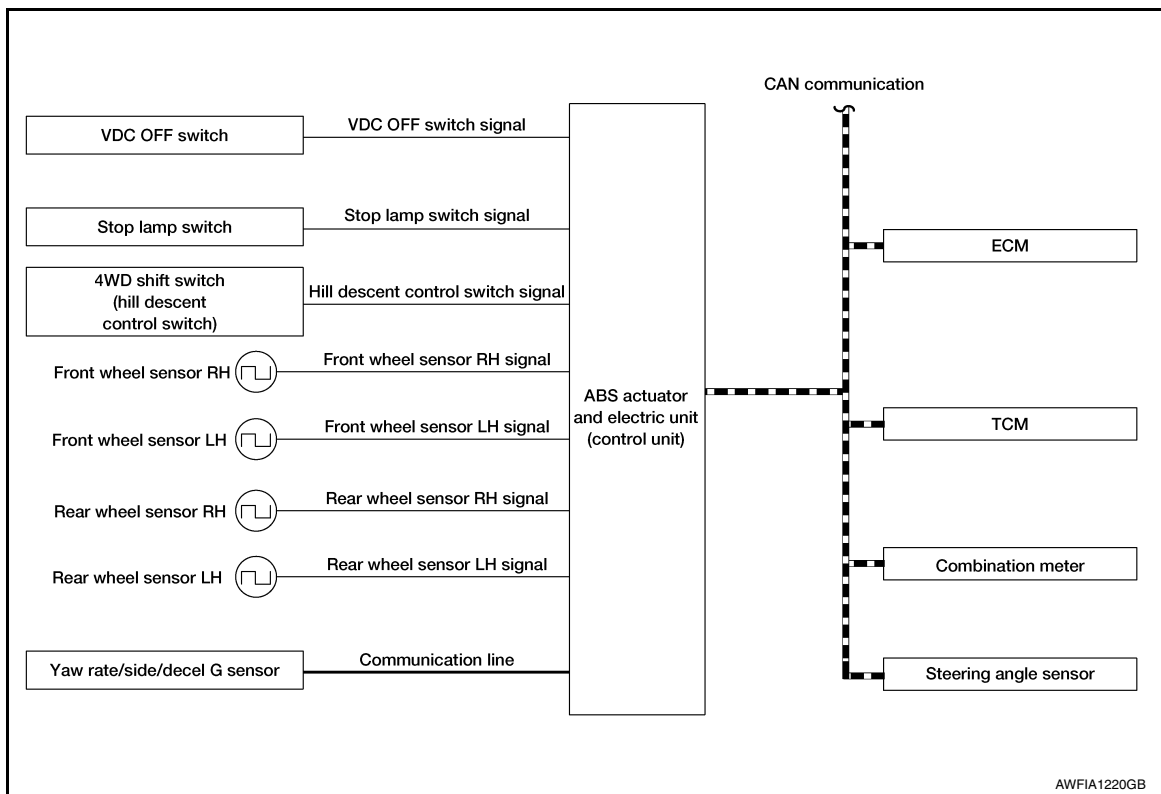
< SYSTEM DESCRIPTION >

[TYPE 2]

Component	Signal description
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Shift position signal
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • Brake fluid level switch signal • Parking brake switch signal Mainly receives the following signals from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none"> • VDC warning lamp signal • VDC OFF indicator lamp signal

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

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



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

INFOID:0000000012551961

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

INPUT SIGNAL AND OUTPUT SIGNAL

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

SYSTEM

< SYSTEM DESCRIPTION >

[TYPE 2]

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 *: <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• Accelerator pedal position signal• Engine speed signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none">• Target throttle position signal
TCM	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none">• Shift position signal
Steering angle sensor	Mainly transmits the following signal to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none">• Steering angle sensor signal
Combination meter	Mainly transmits the following signals to ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none">• Brake fluid level switch signal• Parking brake switch signal Mainly receives the following signal from ABS actuator and electric unit (control unit) via CAN communication: <ul style="list-style-type: none">• Hill descent control indicator lamp signal

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

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

< SYSTEM DESCRIPTION >

[TYPE 2]

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

CONSULT Function

INFOID:000000012551962

CAUTION:

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

APPLICATION ITEMS

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

Mode	Function description
ECU Identification	Parts number of ABS actuator and electric unit (control unit) can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the ABS actuator and electric unit (control unit) can be read.
Active Test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.
Work support	Components can be quickly and accurately adjusted.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

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

SELF DIAGNOSTIC RESULT

Refer to [BRC-206, "DTC Index"](#).

When "CRNT" is displayed on self-diagnosis result,

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result,

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

Freeze frame data (FFD)

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

Item name	Display item
IGN counter (0 – 39)	<p>The number of times that ignition switch is turned ON after the DTC is detected is displayed.</p> <ul style="list-style-type: none">• 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. <p>NOTE: Each time when ignition switch is turned OFF to ON, numerical number increases in 1 → 2 → 3...38 → 39. When the operation number of times exceeds 39, the number do not increase and "39" is displayed until self-diagnosis is erased.</p>

ACTIVE TEST

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

CAUTION:

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

NOTE:

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

< SYSTEM DESCRIPTION >

[TYPE 2]

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

ABS IN Valve and ABS OUT Valve

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

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

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

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

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

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

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

ABS MOTOR

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

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

< SYSTEM DESCRIPTION >

[TYPE 2]

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

NOTE:

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

DATA MONITOR

×: Applicable

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

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

< SYSTEM DESCRIPTION >

[TYPE 2]

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

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

< SYSTEM DESCRIPTION >

[TYPE 2]

Item (Unit)	Monitor item selection		Note
	ECU INPUT SIGNALS	MAIN SIGNALS	
PARK BRAKE SW (On/Off)	×		Parking brake switch signal input status via CAN communication is displayed.
DDS SW ^(Note 2) (On/Off)			Hill descent control switch (On/Off) status is displayed.
DDS SIG ^(Note 2) (On/Off)			Hill descent control operation (On/Off) status is displayed.
USS SIG ^(Note 3) (On/Off)			Hill start assist operation status is displayed.

Note 1: Refer to [BRC-173. "System Description"](#) for ON/OFF conditions of each warning lamp and indicator lamp.

Note 2: DDS means "hill descent control."

Note 3: USS means "hill start assist."

WORK SUPPORT

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

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BRC

APPLICATION NOTICE

< ECU DIAGNOSIS INFORMATION >

[TYPE 2]

ECU DIAGNOSIS INFORMATION

APPLICATION NOTICE

Application Notice

INFOID:0000000012551963

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

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 2]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000012551964

CONSULT DATA MONITOR STANDARD VALUE

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

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 2]

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

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 2]

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

Note 1: Confirm tire pressure is standard value.

Note 2: Refer to [BRC-173. "System Description"](#) for ON/OFF conditions of each warning lamp and indicator lamp.

Note 3: DDS means "hill descent control."

Note 4: USS means "hill start assist."

Fail-Safe

INFOID:000000012551965

VDC FUNCTION, TCS FUNCTION AND HILL START ASSIST FUNCTION

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

ABS FUNCTION

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

NOTE:

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

EBD FUNCTION

ABS warning lamp, brake warning lamp and VDC warning lamp in combination meter turn ON when a malfunction occurs in the system [ABS actuator and electric unit (control unit)]. The control is suspended for VDC function, TCS function, ABS function, EBD function and hill start assist function. The vehicle status becomes

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 2]

the same as models without VDC function, TCS function, ABS function, EBD function and hill start assist function.

DTC	Malfunction detected condition	Fail-safe condition
C1101	When an open circuit is detected in rear RH wheel sensor circuit.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function (only when both 2 rear wheels are malfunctioning) • hill start assist function
C1102	When an open circuit is detected in rear LH wheel sensor circuit.	
C1103	When an open circuit is detected in front RH wheel sensor circuit.	
C1104	When an open circuit is detected in front LH wheel sensor circuit.	
C1105	<ul style="list-style-type: none"> • When power supply voltage of rear RH wheel sensor is low. • When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. • When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. 	
C1106	<ul style="list-style-type: none"> • When power supply voltage of rear LH wheel sensor is low. • When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. • When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. 	
C1107	<ul style="list-style-type: none"> • When power supply voltage of front RH wheel sensor is low. • When distance between front RH wheel sensor and front RH wheel sensor rotor is large. • When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. 	
C1108	<ul style="list-style-type: none"> • When power supply voltage of front LH wheel sensor is low. • When distance between front LH wheel sensor and front LH wheel sensor rotor is large. • When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. 	
C1109	<ul style="list-style-type: none"> • When ignition voltage is 10 V or less. • When ignition voltage is 16 V or more. 	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1111	When a malfunction is detected in motor or motor relay.	
C1115	When difference in wheel speed between any wheel and others is detected during the vehicle is driven because of installation of other tires than specified.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • hill start assist function
C1116	When stop lamp switch signal is not input when brake pedal operates.	
C1120	When a malfunction is detected in front LH ABS IN valve.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1121	When a malfunction is detected in front LH ABS OUT valve.	
C1122	When a malfunction is detected in front RH ABS IN valve.	
C1123	When a malfunction is detected in front RH ABS OUT valve.	
C1124	When a malfunction is detected in rear LH ABS IN valve.	
C1125	When a malfunction is detected in rear LH ABS OUT valve.	
C1126	When a malfunction is detected in rear RH ABS IN valve.	
C1127	When a malfunction is detected in rear RH ABS OUT valve.	
C1130	When a malfunction is detected in ECM system.	<p>The following functions are suspended:</p> <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 2]

DTC	Malfunction detected condition	Fail-safe condition
C1140	When a malfunction is detected in actuator relay.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1142	When a malfunction is detected in pressure sensor.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function
C1143	When a malfunction is detected in steering angle sensor.	
C1144	When neutral position adjustment of steering angle sensor is not complete.	
C1145	When a malfunction is detected in yaw rate signal.	
C1146	When a malfunction is detected in side/decel G signal.	
C1155	When brake fluid level low signal is detected.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • hill start assist function
C1160	When calibration of yaw rate/side/decel G sensor is not complete.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function
C1164	When a malfunction is detected in cut valve 1.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • ABS function • EBD function • hill start assist function
C1165	When a malfunction is detected in cut valve 2.	
C1170	When the information in ABS actuator and electric unit (control unit) is not the same.	
C1197	When a malfunction is detected in vacuum sensor.	Electrical vacuum assistance of brake booster is suspended.
C1198	<ul style="list-style-type: none"> • When an open circuit is detected in vacuum sensor circuit. • When a short circuit is detected in vacuum sensor circuit. • When a malfunction is detected in vacuum sensor noise. 	
C1199	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.	
C119A	When a malfunction is detected in supply power voltage of vacuum sensor.	—
U1000	When CAN communication signal is not continuously received for 2 seconds or more.	The following functions are suspended: <ul style="list-style-type: none"> • VDC function • TCS function • hill start assist function

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DTC Inspection Priority Chart

INFOID:0000000012551966

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

Priority	Detected item (DTC)
1	<ul style="list-style-type: none"> • U1000 CAN COMM CIRCUIT
2	<ul style="list-style-type: none"> • C1170 VARIANT CODING
3	<ul style="list-style-type: none"> • C1130 ENGINE SIGNAL 1 • C1144 ST ANG SEN SIGNAL
4	<ul style="list-style-type: none"> • C1109 BATTERY VOLTAGE [ABNOMAL] • C1111 PUMP MOTOR • C1140 ACTUATOR RLY

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 2]

Priority	Detected item (DTC)
5	<ul style="list-style-type: none"> • C1101 RR RH SENSOR-1 • C1102 RR LH SENSOR-1 • C1103 FR RH SENSOR-1 • C1104 FR LH SENSOR-1 • C1105 RR RH SENSOR-2 • C1106 RR LH SENSOR-2 • C1107 FR RH SENSOR-2 • C1108 FR LH SENSOR-2 • C1115 ABS SENSOR [ABNORMAL SIGNAL] • C1116 STOP LAMP SW • C1120 FR LH IN ABS SOL • C1121 FR LH OUT ABS SOL • C1122 FR RH IN ABS SOL • C1123 FR RH OUT ABS SOL • C1124 RR LH IN ABS SOL • C1125 RR LH OUT ABS SOL • C1126 RR RH IN ABS SOL • C1127 RR RH OUT ABS SOL • C1142 PRESS SEN CIRCUIT • C1143 ST ANG SEN CIRCUIT • C1145 YAW RATE SENSOR • C1146 SIDE G SEN CIRCUIT • C1160 DECEL G SEN SET • C1164 CV 1 • C1165 CV 2 • C1197 VACUUM SENSOR • C1198 VACUUM SEN CIR • C1199 BRAKE BOOSTER • C119A VACUUM SEN VOLT
6	<ul style="list-style-type: none"> • C1155 BR FLUID LEVEL LOW

DTC Index

INFOID:000000012551967

DTC	Display Item	Refer to
C1101	RR RH SENSOR-1	BRC-226, "DTC Description"
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	BRC-231, "DTC Description"
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNOMAL]	BRC-238, "DTC Description"
C1111	PUMP MOTOR	BRC-240, "DTC Description"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-243, "DTC Description"
C1116	STOP LAMP SW	BRC-250, "DTC Description"
C1120	FR LH IN ABS SOL	BRC-254, "DTC Description"
C1121	FR LH OUT ABS SOL	BRC-256, "DTC Description"
C1122	FR RH IN ABS SOL	BRC-254, "DTC Description"
C1123	FR RH OUT ABS SOL	BRC-256, "DTC Description"
C1124	RR LH IN ABS SOL	BRC-254, "DTC Description"
C1125	RR LH OUT ABS SOL	BRC-256, "DTC Description"
C1126	RR RH IN ABS SOL	BRC-254, "DTC Description"
C1127	RR RH OUT ABS SOL	BRC-256, "DTC Description"

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS INFORMATION >

[TYPE 2]

DTC	Display Item	Refer to
C1130	ENGINE SIGNAL 1	BRC-258, "DTC Description"
C1140	ACTUATOR RLY	BRC-260, "DTC Description"
C1142	PRESS SEN CIRCUIT	BRC-262, "DTC Description"
C1143	ST ANG SEN CIRCUIT	BRC-265, "DTC Description"
C1144	ST ANG SEN SIGNAL	BRC-269, "DTC Description"
C1145	YAW RATE SENSOR	BRC-271, "DTC Description"
C1146	SIDE G SEN CIRCUIT	
C1155	BR FLUID LEVEL LOW	BRC-274, "DTC Description"
C1160	DECEL G SEN SET	BRC-278, "DTC Description"
C1164	CV 1	BRC-280, "DTC Description"
C1165	CV 2	
C1170	VARIANT CODING	BRC-282, "DTC Description"
C1197	VACUUM SENSOR	BRC-283, "DTC Description"
C1198	VACUUM SEN CIR	BRC-286, "DTC Description"
C1199	BRAKE BOOSTER	BRC-288, "DTC Description"
C119A	VACUUM SEN VOLT	BRC-291, "DTC Description"
U1000	CAN COMM CIRCUIT	BRC-294, "DTC Description"

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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[TYPE 2]

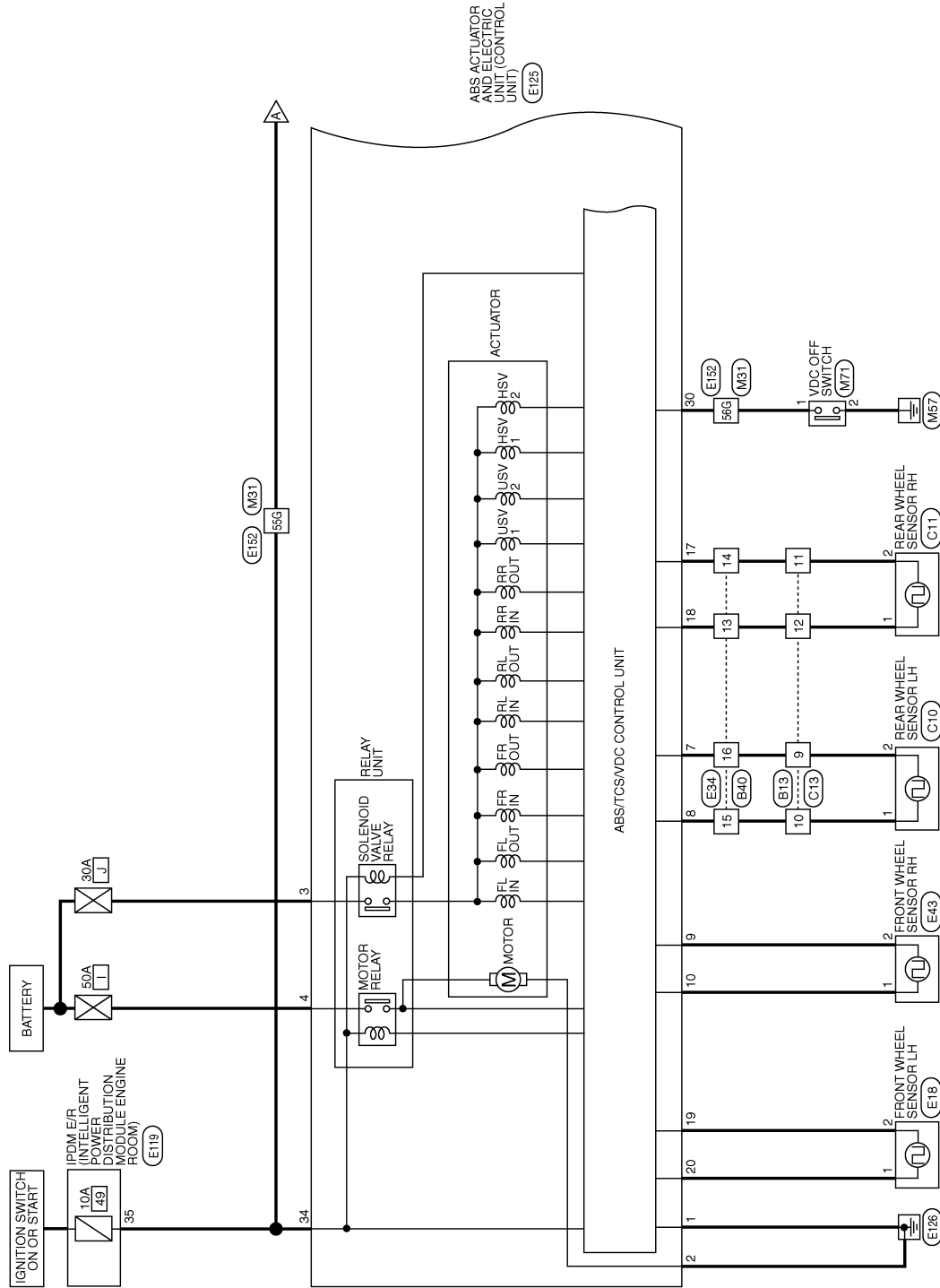
WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram

INFOID:000000012551968

BRAKE CONTROL SYSTEM - VDC WITH HILL DESCENT CONTROL



ABFWA0445GB

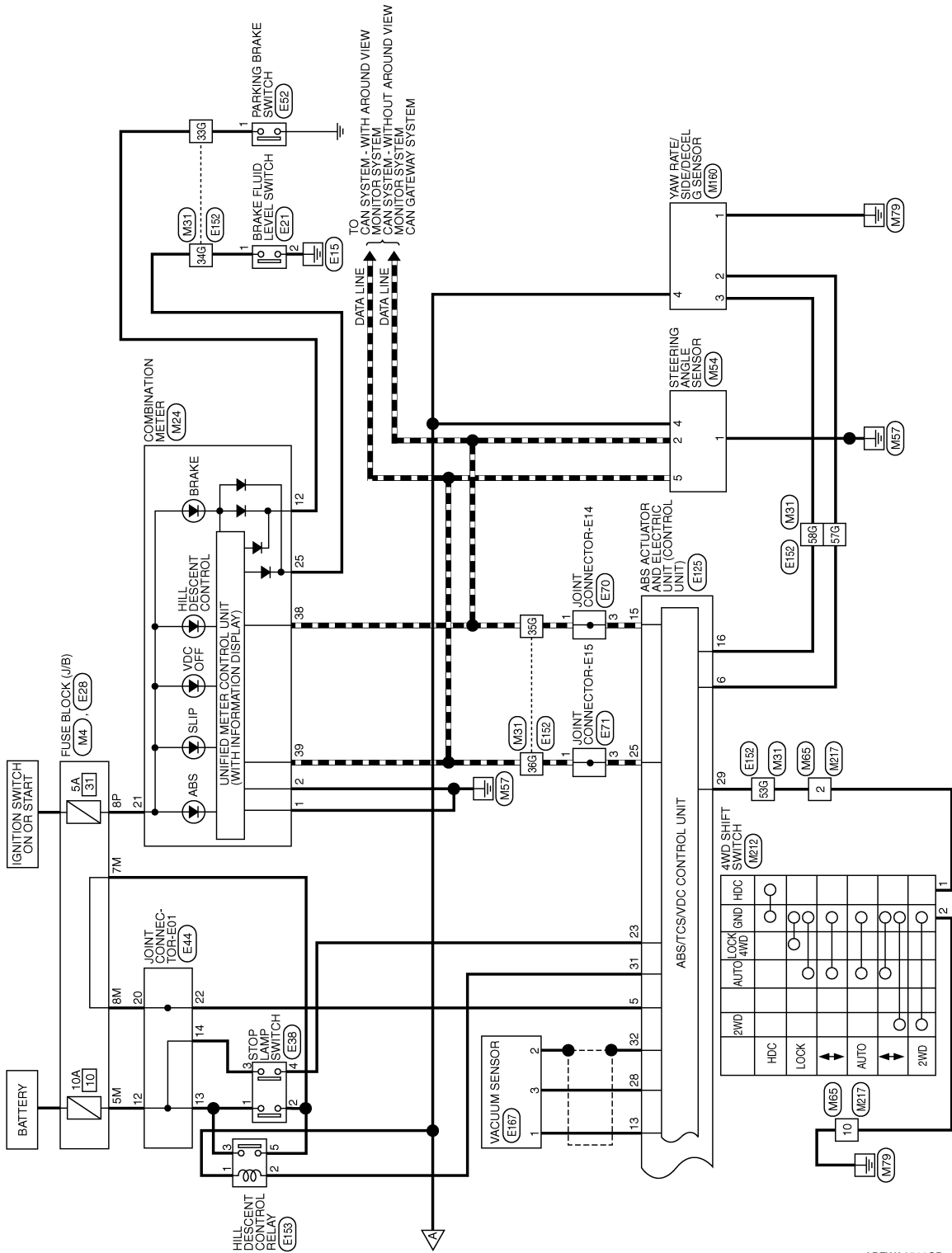
BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

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ABFWA0511GB

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

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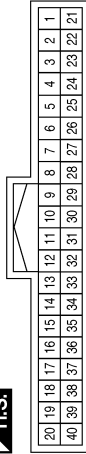
BRAKE CONTROL SYSTEM CONNECTORS - VDC WITH HILL DESCENT CONTROL

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



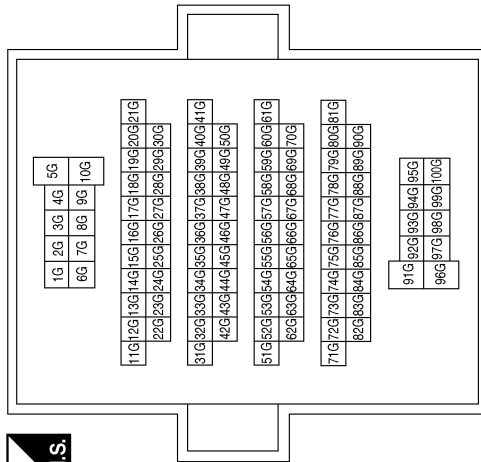
Terminal No.	Color of Wire	Signal Name
8P	BG	-

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



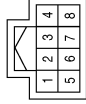
Terminal No.	Color of Wire	Signal Name
1	B	GND1
2	B	GND2
12	G	PKB
21	BG	IGN
25	G	BRAKE OIL SW
38	P	CAN-L
39	L	CAN-H

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
33G	G	-
34G	G	-
35G	P	-
36G	L	-
53G	G	-
55G	G	-
56G	P	-
57G	P	-
58G	L	-

Connector No.	M54
Connector Name	STEERING ANGLE SENSOR
Connector Color	WHITE



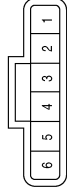
Terminal No.	Color of Wire	Signal Name
1	GR	GND
2	P	CAN-L
4	G	BAT
5	L	CAN-H

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

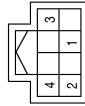
[TYPE 2]

Connector No.	M160
Connector Name	YAW RATE/SIDE/DECEL G SENSOR
Connector Color	BLACK



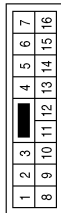
Terminal No.	Color of Wire	Signal Name
1	GR	-
2	P	-
3	L	-
4	G	-

Connector No.	M71
Connector Name	VDC OFF SWITCH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	P	-
2	GR	-

Connector No.	M65
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2	G	-
10	B	-

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



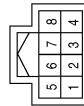
Terminal No.	Color of Wire	Signal Name
1	G	-
2	W	-

Connector No.	M217
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2	G	-
10	B	-

Connector No.	M212
Connector Name	4WD SHIFT SWITCH
Connector Color	BLACK



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

ABFIA0927GB

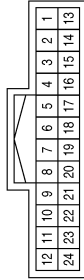
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BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

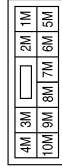
[TYPE 2]

Connector No.	E34
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
13	BG	-
14	P	-
15	R	-
16	G	-

Connector No.	E28
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



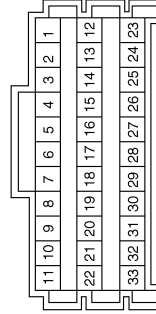
Terminal No.	Color of Wire	Signal Name
5M	Y	-
7M	R	-
8M	R	-

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



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

Connector No.	E44
Connector Name	JOINT CONNECTOR-E01
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
12	Y	-
13	Y	-
14	Y	-
20	R	-
22	R	-

Connector No.	E43
Connector Name	FRONT WHEEL SENSOR RH
Connector Color	BLACK



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

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



Terminal No.	Color of Wire	Signal Name
1	Y	-
2	R	-
3	Y	-
4	W	-

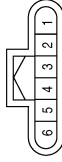
ABFIA1112GB

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

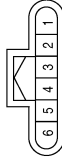
[TYPE 2]

Connector No.	E71
Connector Name	JOINT CONNECTOR-E15
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	-
3	L	-

Connector No.	E70
Connector Name	JOINT CONNECTOR-E14
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	P	-
3	P	-

Connector No.	E52
Connector Name	PARKING BRAKE SWITCH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	LG	-

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



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

ABFIA1113GB

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BRAKE CONTROL SYSTEM

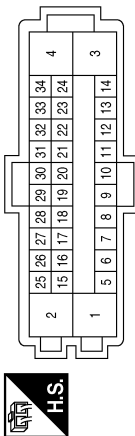
< WIRING DIAGRAM >

[TYPE 2]

Terminal No.	Color of Wire	Signal Name
21	-	-
22	-	-
23	W	STP2
24	-	-
25	L	CAN-H
26	-	-
27	-	-
28	B	VAC SEN (POWER)
29	G	HDCS
30	R	VDC OFF SW
31	W	STPO
32	SHIELD	VAC SEN (GND)
33	-	-
34	BR	IGN (POWER)

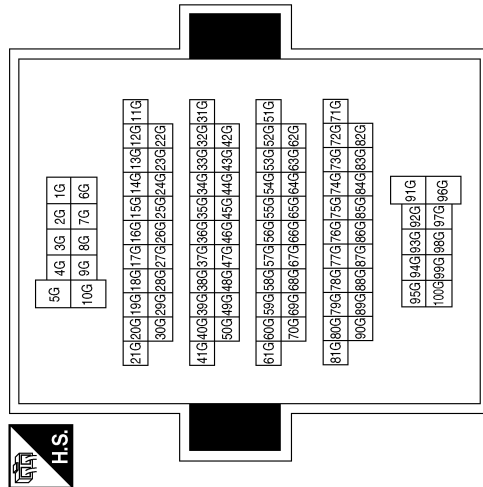
Terminal No.	Color of Wire	Signal Name
6	P	CANM2 (-)
7	G	RR LH SEN (SIGNAL)
8	R	RR LH SEN (POWER)
9	W	FR RH SEN (SIGNAL)
10	G	FR RH SEN (POWER)
11	-	-
12	-	-
13	W	VAC SEN (SIGNAL)
14	-	-
15	P	CAN-L
16	BG	CANM2 (+)
17	P	RR RH SEN (SIGNAL)
18	BG	RR RH SEN (POWER)
19	W	FR LH SEN (SIGNAL)
20	G	FR LH SEN (POWER)

Connector No.	E125
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (WITH 4WD SYSTEM)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	B	ECU (GND)
2	B/W	MOTOR (GND)
3	R	SOLENOID (POWER)
4	W	MOTOR (POWER)
5	R	STOP LAMP SW

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Connector No.	E153
Connector Name	HILL DESCENT CONTROL RELAY
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	BR	-
2	W	-
3	Y	-
5	R	-

ABFIA1114GB

BRAKE CONTROL SYSTEM

< WIRING DIAGRAM >

[TYPE 2]

Connector No.	C11
Connector Name	REAR WHEEL SENSOR RH
Connector Color	GRAY



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

Connector No.	C10
Connector Name	REAR WHEEL SENSOR LH
Connector Color	BLACK



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

Connector No.	E167
Connector Name	VACUUM SENSOR
Connector Color	BLACK



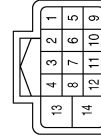
Terminal No.	Color of Wire	Signal Name
1	W	-
2	SHIELD	-
3	B	-

Connector No.	B40
Connector Name	WIRE TO WIRE
Connector Color	WHITE



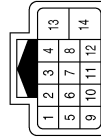
Terminal No.	Color of Wire	Signal Name
13	L	-
14	P	-
15	BR	-
16	Y	-

Connector No.	B13
Connector Name	WIRE TO WIRE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
9	Y	-
10	BR	-
11	P	-
12	L	-

Connector No.	C13
Connector Name	WIRE TO WIRE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
9	W	-
10	B	-
11	P	-
12	V	-

ABFIA0931GB

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APPLICATION NOTICE

< BASIC INSPECTION >

[TYPE 2]

BASIC INSPECTION

APPLICATION NOTICE

Application Notice

INFOID:0000000012551969

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

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TYPE 2]

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000012551970

DETAILED FLOW

1. INTERVIEW THE CUSTOMER

Clarify customer concerns before inspection. First of all, perform an interview utilizing [BRC-218, "Diagnostic Work Sheet"](#) and reproduce the symptom as well as fully understand it. Ask customer about his/her concerns carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

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

>> GO TO 2.

2. CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained in the interview. Also check that the symptom is not caused by fail-safe mode. Refer to [BRC-203, "Fail-Safe"](#).

CAUTION:

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

>> GO TO 3.

3. PERFORM THE SELF-DIAGNOSIS

Ⓜ With CONSULT

1. Turn the ignition switch OFF → ON.

CAUTION:

Be sure to wait of 10 seconds after turning ignition switch OFF or ON.

2. Perform "Self Diagnostic Result" of "ABS".

Is DTC detected?

YES >> Record or print Self Diagnostic Results and Freeze Frame Data (FFD). GO TO 4.

NO >> GO TO 6.

4. RECHECK THE SYMPTOM

Ⓜ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS".
2. Turn the ignition switch OFF → ON → OFF.

CAUTION:

Be sure to wait of 10 seconds after turning ignition switch OFF or ON.

3. Perform DTC confirmation procedures for the malfunctioning system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [BRC-205, "DTC Inspection Priority Chart"](#).

Is DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained in the interview. Refer to [GI-47, "Intermittent Incident"](#).

5. REPAIR OR REPLACE MALFUNCTIONING COMPONENT

1. Repair or replace malfunctioning components.
2. Reconnect component or connector after repairing or replacing.
3. When DTC is detected, erase "Self Diagnostic Result" of "ABS".

CAUTION:

- Turn the ignition switch OFF → ON → OFF after erasing Self Diagnostic Result.
- Be sure to wait of 10 seconds after turning ignition switch OFF or ON.

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TYPE 2]

>> GO TO 7.

6. IDENTIFY MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Identify malfunctioning system based on symptom diagnosis and perform inspection.

Can the malfunctioning system be identified?

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained in the interview. Refer to [GI-47](#), "[Intermittent Incident](#)".

7. FINAL CHECK

⑥ With CONSULT

1. Select "DATA MONITOR" of "ABS"

2. Check the reference values. Refer to [BRC-201](#), "[Reference Value](#)".

3. 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:000000012551971

DESCRIPTION

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

INTERVIEW SHEET SAMPLE

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

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TYPE 2]

Interview sheet

Customer name	MR/MS	Registration number		Initial year registration		A	
		Vehicle type		VIN		B	
Storage date		Engine/traction Motor		Mileage	km (Mile)		
Operating condition, etc.		<input type="checkbox"/> Irrelevant <input type="checkbox"/> When engine/traction motor starts <input type="checkbox"/> During idling <input type="checkbox"/> During driving <input type="checkbox"/> During acceleration <input type="checkbox"/> At constant speed driving <input type="checkbox"/> During deceleration <input type="checkbox"/> Immediately before stop [Vehicle speed: Approx. km/h (MPH)] <input type="checkbox"/> During cornering (right curve or left curve) <input type="checkbox"/> When steering wheel is steered (to right or to left)				C	
Other conditions	VDC OFF switch operation	<input type="checkbox"/> Yes <input type="checkbox"/> No				E	
	Use of other functions (ex. ICC)	<input type="checkbox"/> Yes <input type="checkbox"/> No ()					
	Presence of non-genuine parts installation	<input type="checkbox"/> Yes <input type="checkbox"/> No ()				BRC	
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ADDITIONAL SERVICE WHEN REPLACING ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< BASIC INSPECTION >

[TYPE 2]

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

Description

INFOID:000000012551972

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

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

Work Procedure

INFOID:000000012551973

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to [BRC-221. "Work Procedure"](#), GO TO 2.

2.PERFORM CALIBRATION OF THE DECEL G SENSOR

Perform calibration of the decel G sensor.

>> Refer to [BRC-223. "Work Procedure"](#).

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[TYPE 2]

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Description

INFOID:000000012551974

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

×: Required –: Not required

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

Work Procedure

INFOID:000000012551975

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

CAUTION:

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

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

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

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

CAUTION:

Do not touch steering wheel while adjusting steering angle sensor.

3. After approximately 10 seconds, touch "END".

NOTE:

After approximately 60 seconds, it ends automatically.

4. Turn ignition switch OFF, then turn it ON again.

CAUTION:

Be sure to perform above operation.

>> GO TO 3.

3. CHECK DATA MONITOR

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

Is the steering angle within the specified range?

YES >> GO TO 4.

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

4. ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to [BRC-195, "CONSULT Function"](#).

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

< BASIC INSPECTION >

[TYPE 2]

- ECM: Refer to [EC-71. "CONSULT Function"](#) (USA and Canada) or [EC-563. "CONSULT Function"](#) (Mexico).

Are the memories erased?

YES >> Inspection End.

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

CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

[TYPE 2]

CALIBRATION OF DECEL G SENSOR

Description

INFOID:000000012551976

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

×: Required –: Not required

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

Work Procedure

INFOID:000000012551977

CALIBRATION OF DECEL G SENSOR

CAUTION:

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

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

2. PERFORM CALIBRATION OF DECEL G SENSOR

1. On the CONSULT screen, touch "WORK SUPPORT" and "DECEL G SEN CALIBRATION" in order.
2. Touch "START".
3. After approximately 10 seconds, touch "END".

NOTE:

After approximately 60 seconds, it ends automatically.

4. Turn ignition switch OFF, then turn it ON again.

CAUTION:

Be sure to perform above operation.

>> GO TO 3.

3. CHECK DATA MONITOR

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

Is the inspection result normal?

YES >> GO TO 4.

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

4. ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to [BRC-195, "CONSULT Function"](#).
- ECM: Refer to [EC-71, "CONSULT Function"](#) (USA and Canada) or [EC-563, "CONSULT Function"](#) (Mexico).

CALIBRATION OF DECEL G SENSOR

< BASIC INSPECTION >

[TYPE 2]

Are the memories erased?

YES >> Inspection End.

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

APPLICATION NOTICE

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

DTC/CIRCUIT DIAGNOSIS

APPLICATION NOTICE

Application Notice

INFOID:0000000012551978

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

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BRC

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1101, C1102, C1103, C1104 WHEEL SENSOR

DTC Description

INFOID:000000012551979

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Wheel sensor• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Vehicle was not driven after previous repair


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1101", "C1102", "C1103" or "C1104" is displayed as "CRNT": Proceed to [BRC-227, "Diagnosis Procedure"](#).

YES-2 >> "C1101", "C1102", "C1103" or "C1104" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012551980

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK WHEEL SENSOR

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

Is the inspection result normal?

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

2. REPLACE WHEEL SENSOR (1)

Ⓜ With CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-317, "Removal and Installation - Front Wheel Sensor"](#).
 - Rear: Refer to [BRC-319, "Removal and Installation - Rear Wheel Sensor"](#).
2. Erase "Self Diagnostic Result" of "ABS".
3. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

6. Stop the vehicle.
7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Perform "Self Diagnostic Result" of "ABS".

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

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

3. CHECK CONNECTOR

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

Is the inspection result normal?

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

4. PERFORM SELF-DIAGNOSIS (1)

Ⓜ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS".
2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

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

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

5. Stop the vehicle.
6. Turn the ignition switch OFF.

NOTE:

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C1101, C1102, C1103, C1104 WHEEL SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

Wait at least 10 seconds after turning ignition switch OFF.

7. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

8. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 5.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295](#), "[Diagnosis Procedure](#)".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, fuse, or fusible link.

6. CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 8.

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

7. PERFORM SELF-DIAGNOSIS (2)

 With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

7. Stop the vehicle.
8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

10. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 8.

NO >> Inspection End.

8. CHECK WHEEL SENSOR HARNESS

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

Power Supply Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E125	20	E18	(Front LH wheel)	1 Yes
	10	E43	(Front RH wheel)	
	8	C10	(Rear LH wheel)	
	18	C11	(Rear RH wheel)	

Signal Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E125	19	E18	(Front LH wheel)	2 Yes
	9	E43	(Front RH wheel)	
	7	C10	(Rear LH wheel)	
	17	C11	(Rear RH wheel)	

Is the inspection result normal?

YES >> GO TO 10.

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

9. PERFORM SELF-DIAGNOSIS (3)

With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

7. Stop the vehicle.
8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

10. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 10.

NO >> Inspection End.

10. CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

Does the ABS active wheel sensor tester detect a signal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> GO TO 11.

11. REPLACE WHEEL SENSOR

Ⓢ With CONSULT

1. Replace the wheel sensor.

- Front: Refer to [BRC-317, "Removal and Installation - Front Wheel Sensor"](#).

- Rear: Refer to [BRC-319, "Removal and Installation - Rear Wheel Sensor"](#).

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

3. Erase "Self Diagnostic Result" of "ABS".

4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.

6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

7. Stop the vehicle.

8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

10. Perform "Self Diagnostic Result" of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Inspection End.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1105, C1106, C1107, C1108 WHEEL SENSOR

DTC Description

INFOID:000000012551981

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1105	RR RH SENSOR-2 (Rear RH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of rear RH wheel sensor is low. When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. When there is contamination on or damage to the rear RH wheel sensor or rear RH sensor rotor.
C1106	RR LH SENSOR-2 (Rear LH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of rear LH wheel sensor is low. When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. When there is contamination on or damage to the rear LH wheel sensor or rear LH sensor rotor.
C1107	FR RH SENSOR-2 (Front RH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of front RH wheel sensor is low. When distance between front RH wheel sensor and front RH wheel sensor rotor is large. When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. When there is contamination on or damage to the front RH wheel sensor or front RH sensor rotor.
C1108	FR LH SENSOR-2 (Front LH wheel sensor-2)	<ul style="list-style-type: none"> When power supply voltage of front LH wheel sensor is low. When distance between front LH wheel sensor and front LH wheel sensor rotor is large. When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. When there is contamination on or damage to the front LH wheel sensor or front LH sensor rotor.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> Harness or connector Wheel sensor Sensor rotor Tire size ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	<ul style="list-style-type: none"> Harness or connector Wheel sensor Sensor rotor ABS actuator and electric unit (control unit) Tire size ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Vehicle was not driven after previous repair

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

- Start the engine.
- Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
- Stop the vehicle.
- Turn the ignition switch OFF.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1105", "C1106", "C1107" or "C1108" is displayed as "CRNT": Proceed to [BRC-232, "Diagnosis Procedure"](#).

YES-2 >> "C1105", "C1106", "C1107" or "C1108" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551982

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK WHEEL HUB ASSEMBLY

Check that there is no excessive looseness in wheel hub assembly.

- Front: Refer to [FAX-6, "Inspection"](#).
- Rear: Refer to [RAX-5, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

- NO >> Repair or replace the wheel hub assembly, and GO TO 2.
- Front: Refer to [FAX-8, "Removal and Installation"](#).
 - Rear: Refer to [RAX-7, "Removal and Installation"](#).

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

- NO >> Repair / replace harness, connector, fuse, or fusible link.

3. CHECK TIRE


1. Turn the ignition switch OFF.
2. Check the tire air pressure, wear and size. Refer to [WT-67, "Tire Air Pressure"](#).

Is the inspection result normal?

YES >> GO TO 6.

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

4. CHECK DATA MONITOR (1)

 With CONSULT

1. Erase "Self Diagnostic Result" of "ABS".
2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.
4. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

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

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

5.PERFORM SELF-DIAGNOSIS (1)

ⓂWith CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

4. Perform "Self Diagnostic Result" of "ABS".

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

- YES >> GO TO 6.
NO >> Inspection End.

6.CHECK WHEEL SENSOR AND SENSOR ROTOR

1. Turn the ignition switch OFF.
2. Disconnect wheel sensor harness connector.
3. Remove dust and foreign matter adhered to the wheel sensor and sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.

CAUTION:

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

- **Front:** Refer to [BRC-317, "Exploded View - Front Wheel Sensor"](#).
- **Rear:** Refer to [BRC-318, "Exploded View - Rear Wheel Sensor"](#).

>> GO TO 7.

7.CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

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

8.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

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

9.REPLACE WHEEL SENSOR (1)

ⓂWith CONSULT

1. Replace the wheel sensor.
- Front: Refer to [BRC-317, "Removal and Installation - Front Wheel Sensor"](#).

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

- Rear: Refer to [BRC-319, "Removal and Installation - Rear Wheel Sensor"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 10.

NO >> GO TO 20.

10.PERFORM SELF-DIAGNOSIS (2)

ⓂWith CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

4. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 11.

NO >> Inspection End.

11.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 14.

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

12.CHECK DATA MONITOR (2)

ⓂWith CONSULT

1. Erase "Self Diagnostic Result" of "ABS".
2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

4. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

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

13.PERFORM SELF-DIAGNOSIS (3)

ⓂWith CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after start the engine.
4. Perform "Self Diagnostic Result" of "ABS".

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

- YES >> GO TO 14.
- NO >> Inspection End.

14.CHECK TERMINAL

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

Is the inspection result normal?

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

15.CHECK DATA MONITOR (3)

ⓂWith CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

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

16.PERFORM SELF-DIAGNOSIS (4)

ⓂWith CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after start the engine.
4. Perform "Self Diagnostic Result" of "ABS".

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C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

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

YES >> GO TO 17.

NO >> Inspection End.

17. CHECK WHEEL SENSOR HARNESS

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

Power Supply Circuit

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	20	Ground	No
	10		
	8		
	18		

Is the inspection result normal?

YES >> GO TO 18.

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

18. CHECK DATA MONITOR (4)

Ⓜ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 19.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

19. PERFORM SELF-DIAGNOSIS (5)

Ⓜ With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

4. Perform "Self Diagnostic Result" of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

C1105, C1106, C1107, C1108 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

NO >> Inspection End.

20. REPLACE SENSOR ROTOR

Ⓜ With CONSULT

1. Replace the sensor rotor.
 - Front: Refer to [BRC-321. "Removal and Installation - Front Sensor Rotor"](#).
 - Rear: Refer to [BRC-321. "Removal and Installation - Rear Sensor Rotor"](#).
2. Erase "Self Diagnostic Result" of "ABS".
3. Turn the ignition switch OFF → ON → OFF.

NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
4. Start the engine.
5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
6. Stop the vehicle.
7. Turn the ignition switch OFF.

NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
8. Start the engine.

NOTE:
Wait at least 10 seconds after start the engine.
9. Perform "Self Diagnostic Result" of "ABS".

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

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322. "Removal and Installation"](#).

NO >> Inspection End.

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C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1109 POWER AND GROUND SYSTEM

DTC Description

INFOID:000000012551983

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1109	BATTERY VOLTAGE [ABNORMAL] (Battery voltage [abnormal])	When ignition power supply voltage is in following state: <ul style="list-style-type: none">• Ignition power supply voltage: $10\text{ V} \geq$ ignition power supply voltage.• Ignition power supply voltage: $16\text{ V} \leq$ ignition power supply voltage.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Charge system	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• IPDM E/R• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Charge system

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1109" detected?

YES-1 >> "C1109" is displayed as "CRNT": Proceed to [BRC-238, "Diagnosis Procedure"](#).

YES-2 >> "C1109" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551984

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.

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

C1109 POWER AND GROUND SYSTEM

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

2. PERFORM SELF-DIAGNOSIS

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1109" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4. CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

DTC Description

INFOID:000000012551985

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ With CONSULT

1. Turn the ignition switch OFF → ON, and wait 30 seconds.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1111" detected?

YES-1 >> "C1111" is displayed as "CRNT": Proceed to [BRC-240, "Diagnosis Procedure"](#).

YES-2 >> "C1111" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551986

1. CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 3.

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

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

2. PERFORM SELF-DIAGNOSIS

Ⓜ With CONSULT

1. Turn the ignition switch OFF → ON, and wait 30 seconds.
2. Start the engine.
3. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
4. Stop the vehicle.
5. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
6. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
7. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1111" detected?

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

4. ERASE SELF-DIAGNOSIS RESULT (1)

Ⓜ With CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
3. Stop the vehicle.
4. Erase "Self Diagnostic Result" of "ABS".
5. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.

>> Inspection End.

5. CHECK TERMINAL

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

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).
NO >> Repair / replace harness or connector, and GO TO 6.

6. ERASE SELF-DIAGNOSIS RESULT (2)

Ⓜ With CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
NOTE:
Vehicle must be driven after repair or replacement to erase the previous DTCs.
3. Stop the vehicle.
4. Erase "Self Diagnostic Result" of "ABS".

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

5. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

>> Inspection End.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1115 WHEEL SENSOR

DTC Description

INFOID:000000012551987

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • Wheel sensor • Sensor rotor • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • Wheel sensor • Sensor rotor • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery • Tire size

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Start the engine.
2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
3. Stop the vehicle.
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES-1 >> "C1115" is displayed as "CRNT": Proceed to [BRC-243, "Diagnosis Procedure"](#).

YES-2 >> "C1115" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551988

CAUTION:

Never check between wheel sensor harness connector terminals.

C1115 WHEEL SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

1. CHECK TIRE

Check the tire air pressure, wear and size. Refer to [WT-67, "Tire Air Pressure"](#).

Is the inspection result normal?

YES >> GO TO 4.

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

2. CHECK DATA MONITOR (1)

Ⓜ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS"

2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

4. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 3.

NO >> GO TO 4.

3. PERFORM SELF-DIAGNOSIS (1)

Ⓜ With CONSULT

1. Stop the vehicle.

2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES >> GO TO 4.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, fuse, or fusible link.

5. CHECK WHEEL SENSOR AND SENSOR ROTOR

1. Turn the ignition switch OFF.

2. Disconnect wheel sensor harness connector.

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

CAUTION:

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

• Front: Refer to [BRC-317, "Exploded View - Front Wheel Sensor"](#).

• Rear: Refer to [BRC-318, "Exploded View - Rear Wheel Sensor"](#).

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

>> GO TO 6.

6. CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 8.

7. CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 11.

NO >> GO TO 8.

8. REPLACE WHEEL SENSOR (1)

Ⓜ With CONSULT

1. Replace the wheel sensor.
 - Front: Refer to [BRC-317, "Removal and Installation - Front Wheel Sensor"](#).
 - Rear: Refer to [BRC-319, "Removal and Installation - Rear Wheel Sensor"](#).
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 9.

NO >> GO TO 19.

9. PERFORM SELF-DIAGNOSIS (2)

Ⓜ With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Perform "Self Diagnostic Result" of "ABS".

C1115 WHEEL SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

Is DTC "C1115" detected?

- YES >> GO TO 10.
- NO >> Inspection End.

10. CHECK CONNECTOR

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

Is the inspection result normal?

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

11. CHECK DATA MONITOR (2)

Ⓟ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS"
2. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
4. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

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

12. PERFORM SELF-DIAGNOSIS (3)

Ⓟ With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

- YES >> GO TO 13.
- NO >> Inspection End.

13. CHECK TERMINAL

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

Is the inspection result normal?

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

14. CHECK DATA MONITOR (3)

Ⓟ With CONSULT

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

C1115 WHEEL SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS" A
4. Turn the ignition switch OFF → ON → OFF. B
NOTE:
 Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine. C
6. Select "DATA MONITOR" of "ABS", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR". D
NOTE:
 Set the "DATA MONITOR" recording speed to "10 msec".
7. Read the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor. E
NOTE:
 Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

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

15.PERFORM SELF-DIAGNOSIS (4)

ⓂWith CONSULT

1. Stop the vehicle. G
2. Turn the ignition switch OFF. H
NOTE:
 Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine. I
NOTE:
 Wait at least 10 seconds after starting the engine.
4. Perform "Self Diagnostic Result" of "ABS". J

Is DTC "C1115" detected?

- YES >> GO TO 16.
 NO >> Inspection End.

16.CHECK WHEEL SENSOR HARNESS

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

Power Supply Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E125	20	E18	(Front LH wheel)	1 Yes
	10	E43	(Front RH wheel)	
	8	C10	(Rear LH wheel)	
	18	C11	(Rear RH wheel)	

Signal Circuit

ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E125	19	E18	(Front LH wheel)	2 Yes
	9	E43	(Front RH wheel)	
	7	C10	(Rear LH wheel)	
	17	C11	(Rear RH wheel)	

C1115 WHEEL SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

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

Power Supply Circuit

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	20	Ground	No
	10		
	8		
	18		

Is the inspection result normal?

YES >> GO TO 17.

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

17. CHECK DATA MONITOR (4)

Ⓟ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.
6. Select "DATA MONITOR" of "ABS", 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 the values (wheel speed) of both the normal wheel sensors and malfunctioning wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

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

YES >> GO TO 18.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

18. PERFORM SELF-DIAGNOSIS (5)

Ⓟ With CONSULT

1. Stop the vehicle.
2. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Inspection End.

19. REPLACE SENSOR ROTOR

Ⓟ With CONSULT

1. Replace the sensor rotor.
 - Front: Refer to [BRC-321, "Removal and Installation - Front Sensor Rotor"](#).
 - Rear: Refer to [BRC-321, "Removal and Installation - Rear Sensor Rotor"](#).
2. Erase "Self Diagnostic Result" of "ABS"

C1115 WHEEL SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

3. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

4. Start the engine.

5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

6. Stop the vehicle.

7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1115" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Inspection End.

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C1116 STOP LAMP SWITCH

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

C1116 STOP LAMP SWITCH

DTC Description

INFOID:000000012551989

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1116	STOP LAMP SW (Stop lamp switch)	<ul style="list-style-type: none">• When stop lamp switch signal is not input when brake pedal operates.• When stop lamp switch signal is input when brake pedal is not operated.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Stop lamp switch signal circuit	<ul style="list-style-type: none">• Harness or connector• Stop lamp switch• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF, and wait 10 seconds or more.
2. Start the engine.

NOTE:

Stop the vehicle.

3. Wait 1 minute or more.

NOTE:

Never depress brake pedal.

4. Depress brake pedal by 100 mm (3.94 in) or more, and maintain at that position for a minimum of 1 minute or more.
5. Release brake pedal, and wait 1 minute or more.
6. Repeat step 4 to 5 ten or more times.
7. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

9. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1116" detected?

- YES-1 >> "C1116" is displayed as "CRNT": Proceed to [BRC-251, "Diagnosis Procedure"](#).
YES-2 >> "C1116" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").
NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

INFOID:000000012551990

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

1. Erase "Self Diagnostic Result" of "ABS"
2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Depress the brake pedal several times.
5. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

6. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

7. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1116" detected?

YES >> GO TO 3.

NO >> Inspection End.

3. STOP LAMP FOR ILLUMINATION


Depress brake pedal and check that stop lamps turn ON.

Do the stop lamps turn ON?

YES >> GO TO 5.

NO >> Check the stop lamp system. Refer to [EXL-80. "Wiring Diagram"](#). GO TO 4.

4. CHECK DATA MONITOR (1)

 With CONSULT

1. Erase "Self Diagnostic Result" of "ABS"
2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Select "DATA MONITOR" of "ABS", check "STOP LAMP SW". Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-201. "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 5.

5. CHECK CONNECTOR AND TERMINAL

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

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C1116 STOP LAMP SWITCH

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

4. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
5. Disconnect stop lamp switch harness connector.
6. Check the stop lamp switch harness connector for disconnection or looseness.
7. Check the stop lamp switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 6.

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

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair / replace harness, connector, fuse, or fusible link.

7. CHECK DATA MONITOR (2)

With CONSULT

1. Erase "Self Diagnostic Result" of "ABS"
2. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Stop the vehicle.

4. Select "DATA MONITOR" of "ABS", check "STOP LAMP SW". Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-201. "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 8.

8. CHECK STOP LAMP SWITCH CIRCUIT (1)

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

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E125	5	Ground	Brake pedal depressed	Battery voltage
			Brake pedal not depressed	0 V

4. Turn the ignition switch ON.
5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Condition	Voltage (Approx.)
Connector	Terminal			
E125	5	Ground	Brake pedal depressed	Battery voltage
			Brake pedal not depressed	0 V

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322. "Removal and Installation"](#).

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

9. CHECK STOP LAMP SWITCH CIRCUIT (2)

1. Turn the ignition switch OFF.

C1116 STOP LAMP SWITCH

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

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

ABS actuator and electric unit (control unit)		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
E125	5	E38	2	Yes

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	5	Ground	No

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

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

10. CHECK DATA MONITOR (3)

Ⓜ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect stop lamp switch harness connector.
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
5. Start the engine.
NOTE:
Stop the vehicle.
6. Select "DATA MONITOR" of "ABS", check "STOP LAMP SW". Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to [BRC-201, "Reference Value"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

Component Inspection

INFOID:000000012551991

1. CHECK STOP LAMP SWITCH

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

Stop lamp switch	Condition	Continuity
Terminal		
1 – 2	When stop lamp switch is released (When brake pedal is depressed)	Yes
	When stop lamp switch is pressed (When brake pedal is released)	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the stop lamp switch. Refer to [BR-20, "Removal and Installation"](#).

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

DTC Description

INFOID:000000012551992

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1120", "C1122", "C1124" or "C1126" is displayed as "CRNT": Proceed to [BRC-254, "Diagnosis Procedure"](#).

YES-2 >> "C1120", "C1122", "C1124" or "C1126" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551993

1. CHECK CONNECTOR

C1120, C1122, C1124, C1126 ABS IN VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

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

Is the inspection result normal?

YES >> GO TO 3.

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

2.PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322. "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

DTC Description

INFOID:000000012551994

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

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

YES-1 >> "C1121", "C1123", "C1125" or "C1127" is displayed as "CRNT": Proceed to [BRC-256, "Diagnosis Procedure"](#).

YES-2 >> "C1121", "C1123", "C1125" or "C1127" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551995

1. CHECK CONNECTOR

C1121, C1123, C1125, C1127 ABS OUT VALVE SYSTEM

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

YES >> GO TO 3.

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

2.PERFORM SELF-DIAGNOSIS

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

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

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1130 ENGINE SIGNAL

DTC Description

INFOID:000000012551996

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line	<ul style="list-style-type: none">• Harness or connector• ECM• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1130" detected?

YES-1 >> "C1130" is displayed as "CRNT": Proceed to [BRC-258, "Diagnosis Procedure"](#).

YES-2 >> "C1130" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551997

1. CHECK ENGINE SYSTEM

 With CONSULT

Perform "Self Diagnostic Result" of "ENGINE".

Is DTC detected?

YES >> Check the DTC. Refer to [EC-104, "DTC Index"](#) (VQ35DE FOR USA AND CANADA) or [EC-592, "DTC Index"](#) (VQ35DE FOR MEXICO).

NO >> GO TO 2.

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295](#), "[Diagnosis Procedure](#)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, fuse, or fusible link.

3. CHECK CONNECTOR AND TERMINAL


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

Is the inspection result normal?

YES >> GO TO 4.

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

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

 With CONSULT

1. Connect ECM harness connector.
2. Connect ABS actuator and electric unit (control unit) harness connector.
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1130" or "U1000" detected?

YES ("C1130")>>GO TO 1.

YES ("U1000")>>Refer to [LAN-21](#), "[Trouble Diagnosis Flow Chart](#)".

NO >> Inspection End.

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C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1140 ACTUATOR RELAY SYSTEM

DTC Description

INFOID:000000012551998

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1140" detected?

YES-1 >> "C1140" is displayed as "CRNT": Proceed to [BRC-260, "Diagnosis Procedure"](#).

YES-2 >> "C1140" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012551999

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

Is the inspection result normal?

YES >> GO TO 3.


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

2. PERFORM SELF-DIAGNOSIS

C1140 ACTUATOR RELAY SYSTEM

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> Inspection End.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295](#), "[Diagnosis Procedure](#)".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4. CHECK TERMINAL

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322](#), "[Removal and Installation](#)".

NO >> Repair / replace harness, connector, or terminal.

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C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1142 PRESS SENSOR

DTC Description

INFOID:000000012552000

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Air inclusion in the brake piping• Stop lamp switch system• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Stop lamp switch system• ABS actuator and electric unit (control unit)• Brake system• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• Air inclusion in the brake piping

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1142" detected?

YES-1 >> "C1142" is displayed as "CRNT": Proceed to [BRC-262, "Diagnosis Procedure"](#).

YES-2 >> "C1142" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012552001

1. STOP LAMP SWITCH SYSTEM

Check the stop lamp switch system. Refer to [BRC-251, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace stop lamp switch system.

2. CHECK BRAKE FLUID LEAKAGE

C1142 PRESS SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

Check the brake fluid leakage. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace brake fluid leakage part.

3.CHECK BRAKE PIPING

Check the brake piping. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace brake piping.

- Front: Refer to [BR-23, "FRONT : Removal and Installation"](#).

- Rear: Refer to [BR-26, "REAR : Removal and Installation"](#).

4.CHECK BRAKE PEDAL

Check the brake pedal.

- Brake pedal height: Refer to [BR-7, "Inspection"](#).

- Brake pedal assembly: Refer to [BR-20, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust the brake pedal height or replace brake pedal assembly.

- Adjust the brake pedal: Refer to [BR-13, "Adjustment"](#).

- Replace the brake pedal: Refer to [BR-20, "Removal and Installation"](#).

5.CHECK BRAKE MASTER CYLINDER

Check the brake master cylinder. Refer to [BR-9, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace brake master cylinder. Refer to [BR-28, "Removal and Installation"](#).

6.CHECK BRAKE BOOSTER

Check the brake booster. Refer to [BR-10, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace brake booster. Refer to [BR-31, "Removal and Installation"](#).

7.CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-33, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace vacuum piping. Refer to [BR-33, "Removal and Installation"](#).

8.CHECK FRONT DISC BRAKE

Check the front disc brake caliper. Refer to [BR-36, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace front disc brake caliper. Refer to [BR-37, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).

9.CHECK REAR DISC BRAKE

Check the rear disc brake. Refer to [BR-41, "BRAKE CALIPER ASSEMBLY : Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace rear disc brake. Refer to [BR-42, "BRAKE CALIPER ASSEMBLY : Removal and Installation"](#).

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

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C1142 PRESS SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness, connector, fuse, or fusible link.

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

 With CONSULT

1. Erase "Self Diagnostic Result" of "ABS".

2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

4. Start the engine and drive the vehicle for a short period of time.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

5. Stop the vehicle.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1142" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322. "Removal and Installation"](#).

NO >> Check the ABS actuator and electric unit (control unit) harness connector and terminal for damage, looseness and disconnection. Repair / replace harness, connector, or terminal.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1143 STEERING ANGLE SENSOR

DTC Description

INFOID:0000000012552002

DTC DETECTION LOGIC

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

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery• CAN communication line• Incomplete neutral position adjustment of steering angle sensor• Improper installation of steering angle sensor	<ul style="list-style-type: none">• Harness or connector• Steering angle sensor• ABS actuator and electric unit (control unit)• IPDM E/R• CAN communication line• Wheel alignment• Incomplete neutral position adjustment of steering angle sensor• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1143" detected?

YES-1 >> "C1143" is displayed as "CRNT": Proceed to [BRC-265, "Diagnosis Procedure"](#).

YES-2 >> "C1143" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012552003

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

 With CONSULT

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-221, "Description"](#).


C1143 STEERING ANGLE SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS (1)

 With CONSULT

1. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1143" detected?

YES-1 >> "C1143" is displayed as "CRNT": GO TO 3.

YES-2 >> "C1143" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO >> Inspection End.

3.CHECK CONNECTOR


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

Is the inspection result normal?

YES >> GO TO 5.

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

4.PERFORM SELF-DIAGNOSIS (2)

 With CONSULT

1. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1143" detected?

YES >> GO TO 5.

NO >> Inspection End.

5.CHECK STEERING ANGLE SENSOR POWER SUPPLY

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

Steering angle sensor		—	Voltage (Approx.)
Connector	Terminal		
M54	4	Ground	0 V

4. Turn the ignition switch ON.
NOTE:
Start the engine.
5. Check the voltage between steering angle sensor harness connector and ground.

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

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

6. CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check fuse 49 (10A).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between steering angle sensor harness connector and IPDM E/R harness connector.

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

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M54	4	Ground	No

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

NO >> Repair / replace harness, connector, or fuse.

7. CHECK STEERING ANGLE SENSOR GROUND CIRCUIT

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

Steering angle sensor		—	Continuity
Connector	Terminal		
M54	1	Ground	Yes

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair / replace harness or connector.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair / replace harness, connector, fuse, or fusible link.

9. CHECK TERMINAL

1. Check the steering angle sensor pin terminals for damage or loose connection with harness connector.
2. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair / replace harness, connector, or terminal.

10. CHECK CAN COMMUNICATION LINE

Check the CAN communication line. Refer to [LAN-21, "Trouble Diagnosis Flow Chart"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness or connector.

11. CHECK DATA MONITOR

 With CONSULT

1. Select "DATA MONITOR" of "ABS", check "STR ANGLE SIG".

C1143 STEERING ANGLE SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

2. Check that the indication changes with the steering angle when the steering wheel is turned left/right from the neutral position. Refer to [BRC-201, "Reference Value"](#).

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).
- NO >> Replace the steering angle sensor. Refer to [BRC-325, "Removal and Installation"](#).

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Description

INFOID:000000012552004

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1144	ST ANG SEN SIGNAL (Steering angle sensor not complete)	When neutral position adjustment of steering angle sensor is not complete.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
Incomplete neutral position adjustment of steering angle sensor	<ul style="list-style-type: none">• Harness or connector• Steering angle sensor• ABS actuator and electric unit (control unit)• Incomplete neutral position adjustment of steering angle sensor

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1144" detected?

YES-1 >> "C1144" is displayed as "CRNT": Proceed to [BRC-269, "Diagnosis Procedure"](#).

YES-2 >> "C1144" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012552005

1. ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR

Perform neutral position adjustment of steering angle sensor. Refer to [BRC-221, "Description"](#).

>> GO TO 2.

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

Ⓟ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1144" detected?

YES >> GO TO 3.

NO >> Inspection End.

3. CHECK STEERING ANGLE SENSOR SYSTEM

1. Turn the ignition switch OFF.
2. Check the steering angle sensor system. Refer to [BRC-265, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, or terminal.

4. CHECK DATA MONITOR

 With CONSULT

1. Select "DATA MONITOR" of "ABS", check "STR ANGLE SIG".
2. Check that the indication changes with the steering angle when the steering wheel is turned left/right from the neutral position. Refer to [BRC-201, "Reference Value"](#).

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Replace the steering angle sensor. Refer to [BRC-325, "Removal and Installation"](#).

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

DTC Description

INFOID:000000012552006

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1145	YAW RATE SENSOR (Yaw rate sensor circuit)	<ul style="list-style-type: none"> When a malfunction is detected in yaw rate signal. When a signal line of yaw rate/side/decel G sensor is open or shorted.
C1146	SIDE G SEN CIRCUIT (Side G sensor circuit)	<ul style="list-style-type: none"> When a malfunction is detected in side/decel G signal. When a signal line of yaw rate/side/decel G sensor is open or shorted.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	<ul style="list-style-type: none"> Harness or connector Yaw rate/side/decel G sensor ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1145" or "C1146" detected?

YES-1 >> "C1145" or "C1146" is displayed as "CRNT": Proceed to [BRC-271, "Diagnosis Procedure"](#).

YES-2 >> "C1145" or "C1146" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012552007

CAUTION:

• A malfunction in yaw rate/side/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function is OFF (VDC OFF indicator lamp is in ON status). This is not a malfunction if the status returns to normal after engine is started again. In that case, erase self-diagnosis result memory using CONSULT.

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

- When the engine is in running status and the vehicle is on a turntable at the entrance of parking lot or on a moving unit, VDC warning lamp may turn ON and “ABS” self-diagnosis may display “YAW RATE SENSOR”. In this case, yaw rate sensor is not malfunctioning. The status returns to normal when the vehicle is left from the turntable or moving unit and the engine is started again. In that case, erase self-diagnosis result memory using CONSULT.

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

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

Yaw rate/side/decel G sensor		—	Voltage (Approx.)
Connector	Terminal		
M160	4	Ground	0 V

4. Turn the ignition switch ON.
NOTE:
Never start engine.
5. Check the voltage between yaw rate/side/decel G sensor harness connector and ground.

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

Is the inspection result normal?

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

2. CHECK YAW RATE/SIDE/DECEL G SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check fuse 49 (10A).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between yaw rate/side/decel G sensor harness connector and IPDM E/R harness connector.

Yaw rate/side/decel G sensor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
M160	4	E119	35	Yes

5. Check the continuity between yaw rate/side/decel G sensor harness connector and ground.

Yaw rate/side/decel G sensor		—	Continuity
Connector	Terminal		
M160	4	Ground	No

Is the inspection result normal?

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

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

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

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

Is the inspection result normal?

C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

- YES >> GO TO 4.
- NO >> Repair / replace harness or connector.

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

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

5.CHECK COMMUNICATION LINE

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

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

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Repair / replace harness or connector. Refer to [BRC-166, "Precaution for Harness Repair"](#).


6.CHECK TERMINAL

1. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
2. Check the yaw rate/side/decel G sensor pin terminals for damage or loose connection with harness connector.
3. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

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

7.REPLACE YAW RATE/SIDE/DECEL G SENSOR

 With CONSULT.

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the yaw rate/side/decel G sensor. Refer to [BRC-324, "Removal and Installation"](#).
3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON.

NOTE:

Never start engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1145" or "C1146" detected?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).
- NO >> Inspection End.

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1155 BRAKE FLUID LEVEL SWITCH

DTC Description

INFOID:000000012552008

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1155	BR FLUID LEVEL LOW (Brake fluid level low)	<ul style="list-style-type: none">• When brake fluid level low signal is detected.• When an open circuit is detected in brake fluid level switch circuit.

POSSIBLE CAUSE

NOTE:

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

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• Brake fluid level is low	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• Brake fluid level switch• Combination meter• Brake fluid level is low

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION?

Ⓜ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

- YES-1 >> "C1155" is displayed as "CRNT": Proceed to [BRC-274, "Diagnosis Procedure"](#).
- YES-2 >> "C1155" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012552009

1. CHECK BRAKE FLUID LEVEL

1. Turn the ignition switch OFF.
2. Check the brake fluid level. Refer to [BR-8, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Refill brake fluid. Refer to [BR-14, "Drain and Refill"](#). GO TO 2.

2. PERFORM SELF-DIAGNOSIS (1)

Ⓜ With CONSULT

1. Erase "Self Diagnostic Result" of "ABS"

C1155 BRAKE FLUID LEVEL SWITCH

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 3.

NO >> Inspection End.

3.CHECK CONNECTOR

- Turn the ignition switch OFF.
- Check the combination meter harness connector for disconnection or looseness.
- Check the brake fluid level switch harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 5.

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

4.PERFORM SELF-DIAGNOSIS (2)

ⓂWith CONSULT

- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 5.

NO >> Inspection End.

5.CHECK BRAKE FLUID LEVEL SWITCH

Check the brake fluid level switch. Refer to [BR-28, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace the reservoir tank. Refer to [BR-28, "Exploded View"](#). GO TO 6.

6.PERFORM SELF-DIAGNOSIS (3)

ⓂWith CONSULT

- Erase "Self Diagnostic Result" of "ABS"
- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

- Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

YES >> GO TO 7.

NO >> Inspection End.

7.CHECK CONNECTOR AND TERMINAL

- Turn the ignition switch OFF.
- Disconnect brake fluid level switch harness connector.
- Check the brake fluid level switch harness connector for disconnection or looseness.
- Check the brake fluid level switch pin terminals for damage or loose connection with harness connector.
- Disconnect combination meter harness connector.

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C1155 BRAKE FLUID LEVEL SWITCH

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

6. Check the combination meter harness connector for disconnection or looseness.
7. Check the combination meter pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> GO TO 9.
NO >> Repair / replace harness, connector, or terminal, and GO TO 8.

8.PERFORM SELF-DIAGNOSIS (4)

ⓅWith CONSULT

1. Erase "Self Diagnostic Result" of "ABS"
2. Turn the ignition switch OFF → ON → OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF or ON.
3. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
4. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1155" detected?

- YES >> GO TO 9.
NO >> Inspection End.

9.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

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

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

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

Brake fluid level switch		—	Continuity
Connector	Terminal		
E21	1	Ground	No

Is the inspection result normal?

- YES >> GO TO 10.
NO >> Repair / replace harness or connector, and GO TO 10.

10.CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

Check the continuity between brake fluid level switch harness connector and ground.

Brake fluid level switch		—	Continuity
Connector	Terminal		
E21	2	Ground	Yes

Is the inspection result normal?

- YES >> GO TO 11.
NO >> Repair / replace harness or connector, and GO TO 11.

11.CHECK COMBINATION METER

Check the combination meter. Refer to [MWI-18, "CONSULT Function \(METER/M&A\)"](#).

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

NO >> Repair or replace combination meter. Refer to [MWI-85. "Removal and Installation"](#).

Component Inspection

INFOID:0000000012552010

1. CHECK BRAKE FLUID LEVEL SWITCH

1. Turn the ignition switch OFF.
2. Disconnect brake fluid level switch harness connector.
3. Check the continuity between terminals of brake fluid level switch.

Brake fluid level switch	Condition	Continuity
Terminal		
1 – 2	When brake fluid level in reservoir tank is within the specified level.	No
	When brake fluid level in reservoir tank is less than the specified level.	Yes

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the reservoir tank. Refer to [BR-28. "Exploded View"](#).

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C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

DTC Description

INFOID:0000000012552011

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1160	DECEL G SEN SET (Decel G sensor set)	When calibration of yaw rate/side/decel G sensor is not complete.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Incomplete calibration of decel G sensor• ABS actuator and electric unit (control unit)• Yaw rate/side/decel G sensor• Harness or connector

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

④ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1160" detected?

YES-1 >> "C1160" is displayed as "CRNT": Proceed to [BRC-278. "Diagnosis Procedure"](#).

YES-2 >> "C1160" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012552012

1. DECEL G SENSOR CALIBRATION

Perform decel G sensor calibration. Refer to [BRC-223. "Work Procedure"](#).

>> GO TO 2.

2. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

④ With CONSULT

Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1160" detected?

C1160 INCOMPLETE DECEL G SENSOR CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

YES >> GO TO 3.

NO >> Inspection End.

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3. CHECK YAW RATE/SIDE/DECEL G SENSOR SYSTEM

1. Turn the ignition switch OFF.

2. Check the yaw rate/side/decel G sensor system. Refer to [BRC-271, "Diagnosis Procedure"](#).

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Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

C

NO >> Replace the yaw rate/side/decel G sensor. Refer to [BRC-324, "Removal and Installation"](#).

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C1164, C1165 CV SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1164, C1165 CV SYSTEM

DTC Description

INFOID:0000000012552013

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1164	CV 1 (Cut valve 1)	When a malfunction is detected in cut valve 1.
C1165	CV 2 (Cut valve 2)	When a malfunction is detected in cut valve 2.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit)• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

④ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1164" or "C1165" detected?

YES-1 >> "C1164" or "C1165" is displayed as "CRNT": Proceed to [BRC-280, "Diagnosis Procedure"](#).

YES-2 >> "C1164" or "C1165" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012552014

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 3.

C1164, C1165 CV SYSTEM

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

 With CONSULT

Perform "Self Diagnostic Result" of "ABS" again.

Is DTC "C1164" or "C1165" detected?

YES >> GO TO 3.

NO >> Inspection End.

3.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4.CHECK TERMINAL

Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness.

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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C1170 VARIANT CODING

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1170 VARIANT CODING

DTC Description

INFOID:0000000012552015

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1170	VARIANT CODING (Variant coding)	When the information in ABS actuator and electric unit (control unit) is not the same.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
—	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1170" detected?

YES-1 >> "C1170" is displayed as "CRNT": Proceed to [BRC-282, "Diagnosis Procedure"](#).

YES-2 >> "C1170" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012552016

1. CHECK SELF-DIAGNOSIS RESULTS

Ⓜ With CONSULT

Replace the ABS actuator and electric unit (control unit) even if other DTC are displayed along with "C1170" in "Self Diagnostic Result" of "ABS".

>> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1197 VACUUM SENSOR

DTC Description

INFOID:000000012552017

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1197	VACUUM SENSOR (Vacuum sensor)	When a malfunction is detected in vacuum sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• Vacuum piping• ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Turn the ignition switch OFF.
NOTE:
Wait at least 10 seconds after turning ignition switch OFF.
2. Start the engine.
NOTE:
Wait at least 10 seconds after starting the engine.
3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1197" detected?

- YES-1 >> "C1197" is displayed as "CRNT": Proceed to [BRC-283, "Diagnosis Procedure"](#).
YES-2 >> "C1197" is displayed as "PAST": Inspection End (Erase "Self Diagnostic Result" of "ABS").
NO-1 >> To check malfunction symptom before repair: Refer to [Gl-47, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012552018

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check the vacuum sensor harness connector for disconnection or looseness.
3. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair / replace harness or connector, and GO TO 2.

2. CHECK BRAKE BOOSTER

1. Turn the ignition switch OFF.

C1197 VACUUM SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

2. Check the brake booster. Refer to [BR-10, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the brake booster. Refer to [BR-31, "Removal and Installation"](#).

3. CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-33, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the vacuum piping. Refer to [BR-33, "Removal and Installation"](#).

4. CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, or terminal.

5. CHECK VACUUM SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Disconnect ABS actuator and electric unit (control unit) harness connector.
4. Check the continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E167	1	E125	13	Yes
	2		32	
	3		28	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E167	1	Ground	No
	2		
	3		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness or connector.

6. REPLACE VACUUM SENSOR

Ⓜ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BR-31, "Removal and Installation"](#).

3. Erase "Self Diagnostic Result" of "ABS".
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1197" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Inspection End.

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C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C1198 VACUUM SENSOR

DTC Description

INFOID:000000012552019

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1198	VACUUM SEN CIR (Vacuum sensor circuit)	<ul style="list-style-type: none">• When an open circuit is detected in vacuum sensor circuit.• When a short circuit is detected in vacuum sensor circuit.• When a malfunction is detected in vacuum sensor noise.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓟ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1198" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-286, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012552020

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check the vacuum sensor harness connector for disconnection or looseness.
3. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair / replace harness or connector, and GO TO 2.

2. CHECK TERMINAL

C1198 VACUUM SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, or terminal.

3. CHECK VACUUM SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Disconnect ABS actuator and electric unit (control unit) harness connector.
4. Check the continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E167	1	E125	13	Yes
	2		32	
	3		28	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E167	1	Ground	No
	2		
	3		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness or connector.

4. REPLACE VACUUM SENSOR

Ⓜ With CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BR-31, "Removal and Installation"](#).

3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1198" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Inspection End.

C1199 BRAKE BOOSTER

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

C1199 BRAKE BOOSTER

DTC Description

INFOID:0000000012552021

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1199	BRAKE BOOSTER (Brake booster)	When brake booster vacuum is approx. 0 kPa (0 mm Hg) during engine running.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• ABS actuator and electric unit (control unit) power supply system• Fuse• Fusible link• Battery	<ul style="list-style-type: none">• Harness or connector• Vacuum sensor (brake booster)• Vacuum piping• ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1199" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-288, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012552022

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check the vacuum sensor harness connector for disconnection or looseness.
3. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair / replace harness or connector, and GO TO 2.

2. CHECK BRAKE BOOSTER

C1199 BRAKE BOOSTER

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Check the brake booster. Refer to [BR-10, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the brake booster. Refer to [BR-31, "Removal and Installation"](#).

3.CHECK VACUUM PIPING

Check the vacuum piping. Refer to [BR-33, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the vacuum piping. Refer to [BR-33, "Removal and Installation"](#).

4.CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, or terminal.

5.CHECK VACUUM SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Disconnect ABS actuator and electric unit (control unit) harness connector.
4. Check the continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E167	1	E125	13	Yes
	2		32	
	3		28	

5. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E167	1	Ground	No
	2		
	3		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness or connector.

6.REPLACE VACUUM SENSOR

ⓂWith CONSULT

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to [BR-31, "Removal and Installation"](#).

3. Erase "Self Diagnostic Result" of "ABS"
4. Turn the ignition switch OFF → ON → OFF.

C1199 BRAKE BOOSTER

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after starting the engine.

6. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C1199" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Inspection End.

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

C119A VACUUM SENSOR

DTC Description

INFOID:000000012552023

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C119A	VACUUM SEN VOLT (Vacuum sensor voltage)	When a malfunction is detected in supply power voltage of vacuum sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none"> • Harness or connector • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery 	<ul style="list-style-type: none"> • Harness or connector • Vacuum sensor (brake booster) • ABS actuator and electric unit (control unit) • ABS actuator and electric unit (control unit) power supply system • Fuse • Fusible link • Battery

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

Ⓜ With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "C119A" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-291, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#)

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012552024

1. CHECK CONNECTOR

1. Turn the ignition switch OFF.

2. Check the vacuum sensor harness connector for disconnection or looseness.

3. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness or connector, and GO TO 2.

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

2. CHECK VACUUM SENSOR POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect vacuum sensor harness connector.
3. Check the voltage between vacuum sensor harness connector and ground.

Vacuum sensor		—	Voltage (Approx.)
Connector	Terminal		
E167	3	Ground	0 V

4. Turn the ignition switch ON.
NOTE:
Start the engine.
5. Check the voltage between vacuum sensor harness connector and ground.

Vacuum sensor		—	Voltage (Approx.)
Connector	Terminal		
E167	3	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3. CHECK VACUUM SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check the continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
E167	3	E125	28	Yes

4. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E167	3	Ground	No

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair / replace harness or connector.

4. CHECK VACUUM SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor		—	Continuity
Connector	Terminal		
E167	2	Ground	No

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair / replace harness or connector.

5. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

C119A VACUUM SENSOR

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

Check the ABS actuator and electric unit (control unit) power supply and ground circuits. Refer to [BRC-295](#).
["Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, fuse, or fusible link.

6.CHECK TERMINAL

1. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
2. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322](#). ["Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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U1000 CAN COMM CIRCUIT

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000012552025

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
U1000	CAN COMM CIRCUIT (CAN communication circuit)	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear the DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
<ul style="list-style-type: none">• Harness or connector• CAN communication line	CAN communication system malfunction


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

 With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after starting the engine.

3. Perform "Self Diagnostic Result" of "ABS".

Is DTC "U1000" detected?

YES-1 >> "CRNT" is displayed: Proceed to [BRC-294, "Diagnosis Procedure"](#).

YES-2 >> "PAST" is displayed: Inspection End (Erase "Self Diagnostic Result" of "ABS").

NO-1 >> To check malfunction symptom before repair: Refer to [GI-47, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000012552026

Proceed to [LAN-21, "Trouble Diagnosis Flow Chart"](#).

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000012552027

1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	34	Ground	0 V

4. Turn the ignition switch ON

NOTE:

Start the engine.

5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	34	Ground	Battery voltage

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 the 10A fuse (49).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R.

ABS actuator and electric unit (control unit)		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E125	34	E119	35	Yes

5. Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	34	Ground	No

Is the inspection result normal?

- YES >> Perform trouble diagnosis for ignition power supply.
NO >> Repair / replace harness, connector, or fuse.

3. CHECK MOTOR AND MOTOR RELAY POWER SUPPLY

1. Turn the ignition switch OFF.
2. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	4	Ground	Battery voltage

3. Turn the ignition switch ON.

NOTE:

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POWER SUPPLY AND GROUND CIRCUIT

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

Start the engine.

4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	4	Ground	Battery voltage

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 the 50A fusible link (I).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal 4 and 50A fusible link (I).

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply.
NO >> Repair / replace harness, connector, or fusible link.

5.CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY

1. Turn the ignition switch OFF.
2. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	3	Ground	Battery voltage

3. Turn the ignition switch ON

NOTE:

Start the engine.

4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)		—	Voltage (Approx.)
Connector	Terminal		
E125	3	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 7.
NO >> GO TO 6.

6.CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check the 30A fusible link (J).
3. Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal 3 and 30A fusible link (J).

Is the inspection result normal?

- YES >> Perform trouble diagnosis for battery power supply.
NO >> Repair / replace harness, connector, or fusible link.

7.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check the continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	1	Ground	Yes
	2		

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair / replace harness, connector, or terminal.

8. CHECK TERMINAL

1. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
2. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Repair / replace harness, connector, or terminal.

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HILL DESCENT CONTROL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

HILL DESCENT CONTROL SWITCH

Description

INFOID:000000012552028

The hill descent control switch activates (turn ON) the hill descent control function when the hill descent control switch is pressed.

Component Function Check

INFOID:000000012552029

1. CHECK 4WD SHIFT SWITCH (HILL DESCENT CONTROL SWITCH) OPERATION

Turn ON/OFF the hill descent control switch and check that the hill descent control indicator lamp in the combination meter turns ON/OFF correctly.

Condition	Hill descent control indicator lamp illumination status
Hill descent control switch: ON	ON
Hill descent control switch: OFF	OFF

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to [BRC-298, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012552030

Regarding Wiring Diagram information, refer to [BRC-208, "Wiring Diagram"](#).

1. CHECK 4WD SHIFT SWITCH (HILL DESCENT CONTROL SWITCH)

Perform the hill descent control switch component inspection. Refer to [BRC-299, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2

NO >> Replace hill descent control switch.

2. CHECK 4WD SHIFT SWITCH (HILL DESCENT CONTROL SWITCH) HARNESS

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 29 and hill descent control switch connector M212 terminal 1.

ABS actuator and electric unit (control unit)		Hill descent control switch		Continuity
Connector	Terminal	Connector	Terminal	
E125	29	M212	1	Yes

3. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 29 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	29	Ground	No

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness.

3. CHECK 4WD SHIFT SWITCH (HILL DESCENT CONTROL SWITCH) GROUND

Check continuity between hill descent control switch connector M212 terminal 2 and ground.

HILL DESCENT CONTROL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

Hill descent control switch		—	Continuity
Connector	Terminal		
M212	2	Ground	Yes

Is the inspection result normal?

- YES >> GO TO 4
- NO >> Repair or replace harness.

4.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to [MWI-18, "Description"](#).

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).
- NO >> Replace combination meter. Refer to [MWI-85, "Removal and Installation"](#).

Component Inspection

INFOID:0000000012552031

1.CHECK 4WD SHIFT SWITCH (HILL DESCENT CONTROL SWITCH)

BRC

1. Turn ignition switch OFF.
2. Disconnect hill descent control switch connector.
3. Check continuity between hill descent control switch terminals.

Hill descent control switch terminals	Condition	Continuity
1 – 2	Hill descent control switch is ON.	Yes
	Hill descent control switch is OFF.	No

Is the inspection result normal?

- YES >> Inspection End
- NO >> Replace hill descent control switch. Refer to [BRC-327, "Removal and Installation"](#)

Special Repair Requirement

INFOID:0000000012552032

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-221, "Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-223, "Description"](#).

>> END

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

PARKING BRAKE SWITCH

Description

INFOID:000000012552033

Transmits the parking brake switch signal to the combination meter.

Component Function Check

INFOID:000000012552034

1.COMBINATION METER INPUT SIGNAL

1. Start engine.
2. Monitor BRAKE W/L in DATA MONITOR while applying and releasing the parking brake.

Condition **CONSULT**
Parking brake applied : **ON**
Parking brake released : **OFF**

>> Inspection End.

Diagnosis Procedure

INFOID:000000012552035

Regarding Wiring Diagram information, refer to [MWI-31, "Wiring Diagram"](#).

1.CHECK PARKING BRAKE SWITCH CIRCUIT

1. Disconnect combination meter harness connector M24 and parking brake switch harness connector E52.
2. Check continuity between combination meter harness connector M24 terminal 12 and parking brake switch harness connector E52 terminal 1.

Combination meter		Parking brake switch		Continuity
Connector	Terminal	Connector	Terminal	
M24	12	E52	1	Yes

3. Check continuity between combination meter harness connector M24 terminal 12 and ground.

Combination meter		Ground	Continuity
Connector	Terminal		
M24	12		No

Is the inspection result normal?

- YES >> Inspection End.
NO >> Repair or replace harness or connectors.

Component Inspection

INFOID:000000012552036

1.CHECK PARKING BRAKE SWITCH

Check continuity between parking brake switch terminal 1 and switch case ground.

Component	Terminal	Condition	Continuity
Parking brake switch	1	Parking brake applied	Yes
		Parking brake released	No

Is the inspection result normal?

- YES >> Inspection End.
NO >> Replace parking brake switch. Refer to [PB-7, "Exploded View"](#).

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

VDC OFF SWITCH

Component Function Check

INFOID:000000012552037

1. CHECK VDC OFF SWITCH OPERATION

Check that VDC OFF indicator lamp in combination meter turns ON/OFF when VDC OFF switch is operated.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-301, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012552038

Regarding Wiring Diagram information, refer to [BRC-208, "Wiring Diagram"](#).

1. CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector E125 and VDC OFF switch connector M71.
3. Check connectors and terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace as necessary.

2. CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to [BRC-302, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace VDC OFF switch.

3. CHECK VDC OFF SWITCH SIGNAL

Ⓜ With CONSULT.

1. Connect ABS actuator and electric unit (control unit) connector E125 and VDC OFF switch connector M71.
2. Turn ignition switch ON.
3. In "DATA MONITOR" select "OFF SW" and check VDC OFF switch signal.

Condition	DATA MONITOR
VDC OFF switch is pressed and released	On
VDC OFF switch is pressed and released again	Off

Is the inspection result normal?

YES >> Refer to [BRC-217, "Work Flow"](#).

NO >> GO TO 4.

4. CHECK VDC OFF SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector E125 and VDC OFF switch connector M71.
3. Check continuity between ABS actuator and electric unit (control unit) connector E125 terminal 30 and VDC OFF switch connector M71 terminal 1.

ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E125	30	M71	1	Yes

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VDC OFF SWITCH

[TYPE 2]

< DTC/CIRCUIT DIAGNOSIS >

4. Check continuity between ABS actuator and electric unit (control unit) connector terminal E125 terminal 30 and ground.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E125	30	Ground	No

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace malfunctioning components.

5.CHECK VDC OFF SWITCH GROUND CIRCUIT

Check continuity between VDC OFF switch connector M71 terminal 2 and ground.

VDC OFF switch		—	Continuity
Connector	Terminal		
M71	2	Ground	Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000012552039

1.CHECK VDC OFF SWITCH

1. Turn ignition switch OFF.
2. Disconnect VDC OFF switch connector.
3. Check continuity between terminals of VDC OFF switch connector.

VDC OFF switch terminals	Condition	Continuity
1 – 2	VDC OFF switch pressed	Yes
	VDC OFF switch released	No

Is the inspection result normal?

- YES >> Inspection End.
NO >> Replace VDC OFF switch.

ABS WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

ABS WARNING LAMP

Component Function Check

INFOID:000000012552040

1. CHECK ABS WARNING LAMP FUNCTION

Check that ABS warning lamp in combination meter turns ON for approximately 2 seconds after ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-303, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012552041

1. PERFORM THE SELF-DIAGNOSIS

 With CONSULT.

Perform self-diagnostic result.

Are any DTCs detected?

YES >> Refer to [BRC-206, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-9, "METER SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-85, "Removal and Installation"](#).

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BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

BRAKE WARNING LAMP

Component Function Check

INFOID:000000012552042

1.CHECK BRAKE WARNING LAMP FUNCTION (1)

Check that brake warning lamp in combination meter turns ON for approximately 2 seconds after ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to [BRC-304, "Diagnosis Procedure"](#).

2.CHECK BRAKE WARNING LAMP FUNCTION (2)

Check that brake warning lamp in combination meter turns ON/OFF when parking brake is operated.

Is the inspection result normal?

YES >> Inspection End.

NO >> Check parking brake switch system. Refer to [BRC-300, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012552043

1.PERFORM THE SELF-DIAGNOSIS

ⓅWith CONSULT.

Perform self-diagnostic result.

Are any DTCs detected?

YES >> Refer to [BRC-206, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-9, "METER SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-85, "Removal and Installation"](#).

HILL DESCENT CONTROL INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

HILL DESCENT CONTROL INDICATOR LAMP

Description

INFOID:0000000012552044

x: ON –: OFF

Condition	Hill descent control indicator lamp
Ignition switch OFF	–
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	–
Hill descent control function is malfunctioning.	–

Component Function Check

INFOID:0000000012552045

1.CHECK HILL DESCENT CONTROL INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to [BRC-305, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000012552046

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to [BRC-195, "CONSULT Function"](#).

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to [MWI-18, "Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-85, "Removal and Installation"](#).

Special Repair Requirement

INFOID:0000000012552047

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-221, "Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-223, "Description"](#).

>> END

VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

VDC OFF INDICATOR LAMP

Component Function Check

INFOID:000000012552048

1.CHECK VDC OFF INDICATOR LAMP FUNCTION (1)

Check that VDC OFF indicator lamp in combination meter turns ON for approximately 2 seconds after ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to [BRC-306, "Diagnosis Procedure"](#).

2.CHECK VDC OFF INDICATOR LAMP FUNCTION (2)

Check that VDC OFF indicator lamp in combination meter turns ON/OFF when VDC OFF switch is operated.

Is the inspection result normal?

YES >> Inspection End.

NO >> Check VDC OFF switch. Refer to [BRC-301, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012552049

1.PERFORM THE SELF-DIAGNOSIS

ⓅWith CONSULT.

Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to [BRC-206, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-9, "METER SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-85, "Removal and Installation"](#).

SLIP INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[TYPE 2]

SLIP INDICATOR LAMP

Component Function Check

INFOID:000000012552050

1.CHECK SLIP INDICATOR LAMP FUNCTION

Check that slip indicator lamp in combination meter turns ON for approximately 2 seconds after ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to diagnosis procedure. Refer to [BRC-307, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000012552051

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT.

Perform self diagnostic result.

Are any DTCs detected?

YES >> Refer to [BRC-206, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COMBINATION METER

Check if indication and operation of combination meter are normal. Refer to [MWI-9, "METER SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-85, "Removal and Installation"](#).

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APPLICATION NOTICE

< SYMPTOM DIAGNOSIS >

[TYPE 2]

SYMPTOM DIAGNOSIS

APPLICATION NOTICE

Application Notice

INFOID:0000000012552052

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/VDC/TCS/ABS

VDC/TCS/ABS

Symptom Table

INFOID:000000012552053

If ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp turn ON, perform self-diagnosis.

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-310, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-311, "Diagnosis Procedure"
	Make sure the braking force is sufficient when the ABS is not operating.	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-312, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-313, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-314, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-315, "Diagnosis Procedure"
	TCM	
	ECM	

NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal.
 - When shifting gears
 - When driving on slippery road
 - During cornering at high speed
 - When passing over bumps or grooves [approximately 50 mm (1.97 in) or more]
 - When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]

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EXCESSIVE OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[TYPE 2]

EXCESSIVE OPERATION FREQUENCY

Description

INFOID:000000012552054

VDC function, TCS function, ABS function, EBD function, hill start assist function or hill descent control function operates in excessive operation frequency.

Diagnosis Procedure

INFOID:000000012552055

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 [FAX-6, "Inspection"](#).

• Rear axle: Refer to [RAX-5, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

3. CHECK WHEEL SENSOR

Check wheel sensor.

• Check installation and damage of wheel sensor.

• Check connection of wheel sensor harness connector.

• Check terminal of wheel sensor harness connector.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair installation or replace wheel sensor.

• Front wheel sensor: Refer to [BRC-317, "Removal and Installation - Front Wheel Sensor"](#).

• Rear wheel sensor: Refer to [BRC-319, "Removal and Installation - Rear Wheel Sensor"](#).

4. CHECK SENSOR ROTOR

Check that there is no looseness, damage or foreign material on sensor rotor.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair installation or replace sensor rotor.

• Front sensor rotor: Refer to [BRC-321, "Removal and Installation - Front Sensor Rotor"](#).

• Rear sensor rotor: Refer to [BRC-321, "Removal and Installation - Rear Sensor Rotor"](#).

5. CHECK WARNING LAMP TURNS OFF

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn OFF approx. 1 second 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 >> Inspection End.

NO >> Perform self-diagnosis result. Refer to [BRC-195, "CONSULT Function"](#).

UNEXPECTED BRAKE PEDAL REACTION

< SYMPTOM DIAGNOSIS >

[TYPE 2]

UNEXPECTED BRAKE PEDAL REACTION

Description

INFOID:000000012552056

A malfunction of brake pedal feel (height or others) is detected when brake pedal is depressed.

Diagnosis Procedure

INFOID:000000012552057

1.CHECK FRONT AND REAR AXLE

Check that there is no excessive looseness in front and rear axle.

- Front axle: Refer to [FAX-6. "Inspection"](#).
- Rear axle: Refer to [RAX-5. "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace malfunctioning components.

2.CHECK DISC ROTOR

Check disc rotor runout.

- Front: Refer to [BR-16. "DISC ROTOR : Inspection"](#).
- Rear: Refer to [BR-18. "DISC ROTOR : Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Refinish the disc rotor.

3.CHECK BRAKE FLUID LEAKAGE

Check fluid leakage. Refer to [BR-8. "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Repair or replace malfunctioning components.

4.CHECK BRAKE PEDAL

Check brake pedal. Refer to [BR-7. "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 5.
- NO >> Adjust brake pedal. Refer to [BR-13. "Adjustment"](#).

5.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Check brake system.

6.CHECK BRAKE PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector so that ABS does not operate. Check that brake force is normal in this condition. Connect harness connectors after checking.

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Check brake system.

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THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[TYPE 2]

THE BRAKING DISTANCE IS LONG

Description

INFOID:0000000012552058

Brake stopping distance is long when ABS function is operated.

Diagnosis Procedure

INFOID:0000000012552059

CAUTION:

Brake stopping distance on slippery roads like a rough road, gravel road or snowy road may become longer when ABS is operated than when ABS is not operated.

1.CHECK BRAKING FORCE

Check brake force using a brake tester.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2.CHECK BRAKE PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector so that ABS does not operate. Check brake stopping distance in this condition. Connect harness connectors after checking.

Is the inspection result normal?

YES >> Inspection End.

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[TYPE 2]

ABS FUNCTION DOES NOT OPERATE

Description

INFOID:0000000012552060

VDC function, TCS function, ABS function, EBD function, hill start assist function or hill descent control function does not operate.

Diagnosis Procedure

INFOID:0000000012552061

CAUTION:

- VDC function, TCS function, ABS function, EBD function, hill start assist function and hill descent control function never operate when the vehicle speed is 10 km/h (6.2 MPH) or less. However, hill start assist function operates when the vehicle speed is 0 km/h (0 MPH) (the vehicle is in stop status).
- VDC function and TCS function never operate when VDC OFF switch is operated (when VDC OFF indicator lamp turns ON).
- Hill descent control function operates when hill descent control switch is operated (when hill descent control system on indicator light turns ON).

1. CHECK ABS WARNING LAMP

Check that ABS warning lamp, brake warning lamp and VDC warning lamp turn ON and turn OFF approx. 1 second after key switch is turned ON. Check that ABS warning lamp, brake warning lamp and VDC warning lamp and stay in OFF status during driving.

CAUTION:

Brake warning lamp turns ON when parking brake is operated (parking brake switch is ON) or brake fluid is less than the specified level (brake fluid level switch is ON).

Is the inspection result normal?

YES >> Inspection End.

NO >> Perform self-diagnosis result. Refer to [BRC-195. "CONSULT Function"](#).

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[TYPE 2]

BRAKE PEDAL VIBRATION OR OPERATION SOUND OCCURS

Description

INFOID:000000012552062

- Brake pedal vibrates and motor sound from ABS actuator and electric unit (control unit) occurs when the engine starts.
- Brake pedal vibrates during braking.

CAUTION:

Vibration may be felt during brake pedal is lightly depressed (just placing a foot on it) in the following conditions. This is normal.

- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [Approx. 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approx. 10 km/h (6.2 MPH) or higher]

Diagnosis Procedure

INFOID:000000012552063

1. SYMPTOM CHECK 1

Check that there are pedal vibrations when the engine is started.

Do vibrations occur?

- YES >> GO TO 2.
- NO >> Check brake pedal. Refer to [BR-7. "Inspection"](#).

2. SYMPTOM CHECK 2

Check that motor sound from ABS actuator occurs when the engine starts.

Does the operation sound occur?

- YES >> GO TO 3.
- NO >> Perform self-diagnosis result. Refer to [BRC-195. "CONSULT Function"](#).

3. SYMPTOM CHECK 3

Check symptoms when electrical component (head lamps, etc.) switches are operated.

Does the symptom occur?

- YES >> Check that radio (including wiring), antenna and antenna lead-in wires are not located near ABS actuator and electric unit (control unit). Move them if they are located near ABS actuator and electric unit (control unit).
- NO >> Inspection End.

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

[TYPE 2]

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Description

INFOID:000000012552064

The vehicle jerks when VDC function, TCS function, ABS function, EBD function, hill start assist function or hill descent control function operates.

Diagnosis Procedure

INFOID:000000012552065

1. CHECK SYMPTOM

Check that the vehicle jerks when VDC function, TCS function, ABS function, EBD function, hill start assist function or hill descent control function operates.

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 2.

2. PERFORM THE SELF-DIAGNOSIS

Ⓜ With CONSULT

Perform self-diagnosis result. Refer to [BRC-195, "CONSULT Function"](#).

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-206, "DTC Index"](#).

NO >> GO TO 3.

3. CHECK CONNECTOR

Ⓜ With CONSULT

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check connector terminal for deformation, disconnection and looseness.
4. Connect harness connector and perform self-diagnosis result. Refer to [BRC-195, "CONSULT Function"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace connector terminal.

4. CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

Ⓜ With CONSULT

Perform self-diagnosis result for "ENGINE" and "TRANSMISSION".

Is any DTC detected?

YES >> Check the DTC.

NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-322, "Removal and Installation"](#).

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[TYPE 2]

NORMAL OPERATING CONDITION

Description

INFOID:0000000012552066

Symptom	Result
<p>Brake pedal slightly vibrates and operation sound (motor sound and sound from suspension) occurs when VDC function, TCS function, ABS function, EBD function, hill start assist function or hill descent control function operates.</p>	<p>This is not a malfunction, because it is caused by VDC function, TCS function, ABS function, EBD function, hill start assist function or hill descent control function that are normally operated.</p>
<p>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.</p>	
<p>Brake pedal vibrates and operation sound occurs during sudden acceleration and cornering, when VDC function or TCS function is operated.</p>	
<p>Brake pedal vibrates and motor sound from the engine room occurs when the engine starts or the vehicle starts just after starting the engine.</p>	<p>This is not a malfunction because it is caused by operation check of ABS actuator and electric unit (control unit).</p>
<p>Acceleration may be felt insufficient depending on the road conditions.</p>	<p>This is not a malfunction because it is caused by TCS function that puts the highest priority to obtain the optimum traction (stability).</p>
<p>TCS function may operate momentarily while driving on a road where friction coefficient varies or when downshifting or fully depressing accelerator pedal.</p>	
<p>ABS warning lamp and VDC warning lamp may turn ON when the vehicle is on a rotating turntable or is given a strong shaking or large vibrations on a ship while the engine is running.</p>	<p>In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. In that case, erase "ABS" self-diagnosis result memory with CONSULT.</p>
<p>VDC warning lamp may turn ON and VDC function and TCS function may not normally operate, when driving on a special road the is extremely slanted (bank in a circuit course).</p>	
<p>A malfunction in yaw rate/side/decel G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function and TCS function are OFF (VDC OFF switch is pressed and VDC OFF indicator lamp is in ON status).</p>	
<p>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.</p>	<p>This is normal. (When checking the vehicle on a chassis dynamometer, operate VDC OFF switch so that TCS function is OFF.)</p>

WHEEL SENSOR

< UNIT REMOVAL AND INSTALLATION >

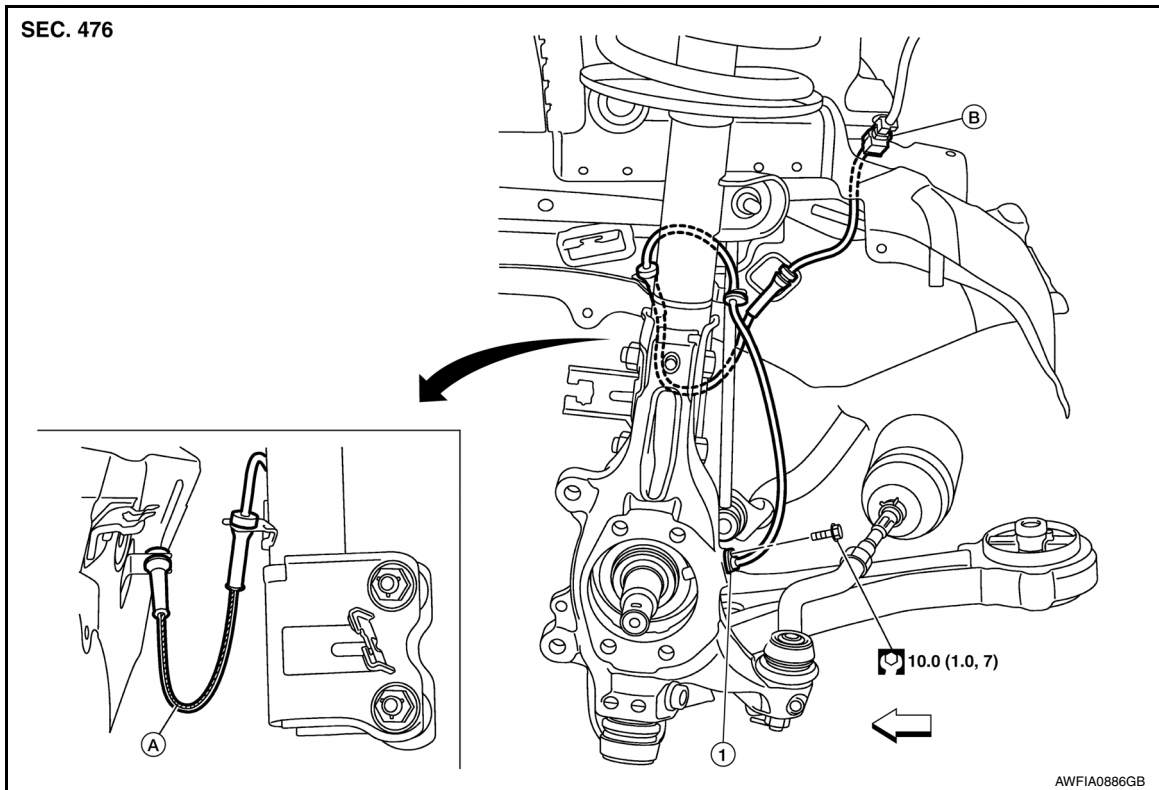
[TYPE 2]

UNIT REMOVAL AND INSTALLATION

WHEEL SENSOR

Exploded View - Front Wheel Sensor

INFOID:000000012552067



1. Front wheel sensor

A. Color line (slant line)

B. Front wheel sensor connector

⇐ Front

Removal and Installation - Front Wheel Sensor

INFOID:000000012552068

CAUTION:

- Be careful not to damage front wheel sensor edge and sensor rotor teeth.
- When removing the front wheel hub and bearing, first remove the front wheel sensor from the steering knuckle. Failure to do so may result in damage to the front wheel sensor wires making the front wheel sensor inoperative.
- Pull out the front wheel sensor, being careful to turn it as little as possible. Do not pull on the front wheel sensor harness.
- Before installation, check if foreign objects such as iron fragments are adhered to the pick-up part of the front wheel sensor or to the inside of the hole in the steering knuckle for the front wheel sensor, or if a foreign object is caught in the surface of the mating surface for the sensor rotor. Fix as necessary and then install the front wheel sensor.

REMOVAL

1. Remove the front wheel and tire using power tool. Refer to [WT-59. "Adjustment"](#).
2. Partially remove the fender protector to gain access to the wheel sensor harness connector.
3. Disconnect the front wheel sensor harness connector.
4. Remove the front wheel sensor bolt.
5. Remove the front wheel sensor from the strut bracket and body brackets.
6. Remove the front wheel sensor from the steering knuckle.

INSTALLATION

WHEEL SENSOR

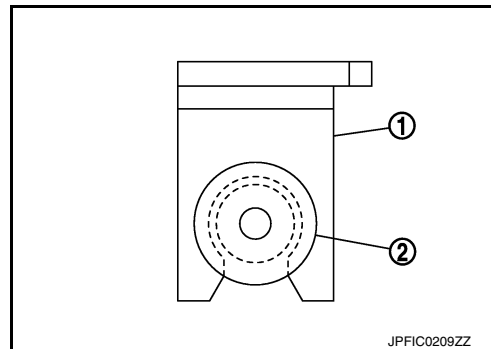
< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

Installation is in the reverse order of removal.

CAUTION:

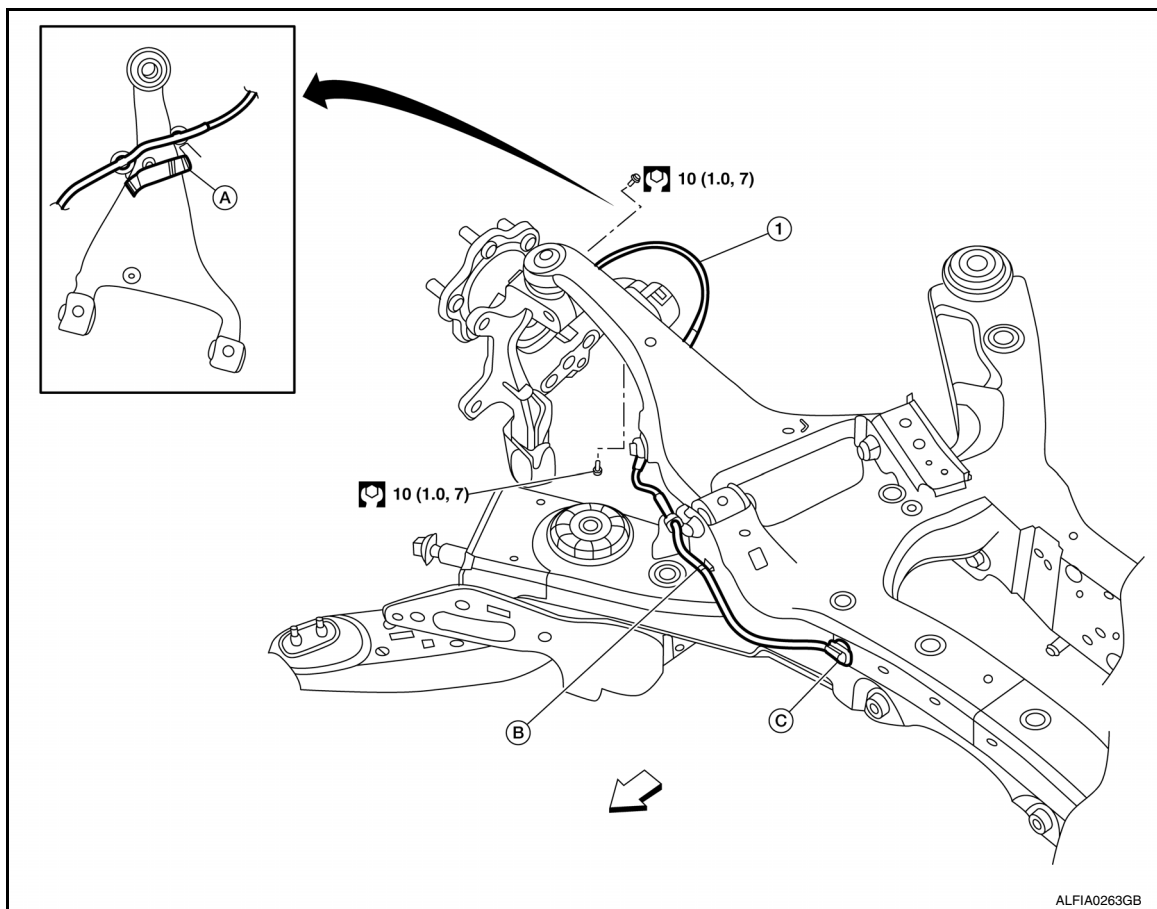
- When installing, make sure there is no foreign material such as iron chips on and in the hole in the steering knuckle for the front wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- Do not twist front wheel sensor harness when installing front wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that front wheel sensor harness is not twisted after installation.



Exploded View - Rear Wheel Sensor

INFOID:000000012552069

RH Side



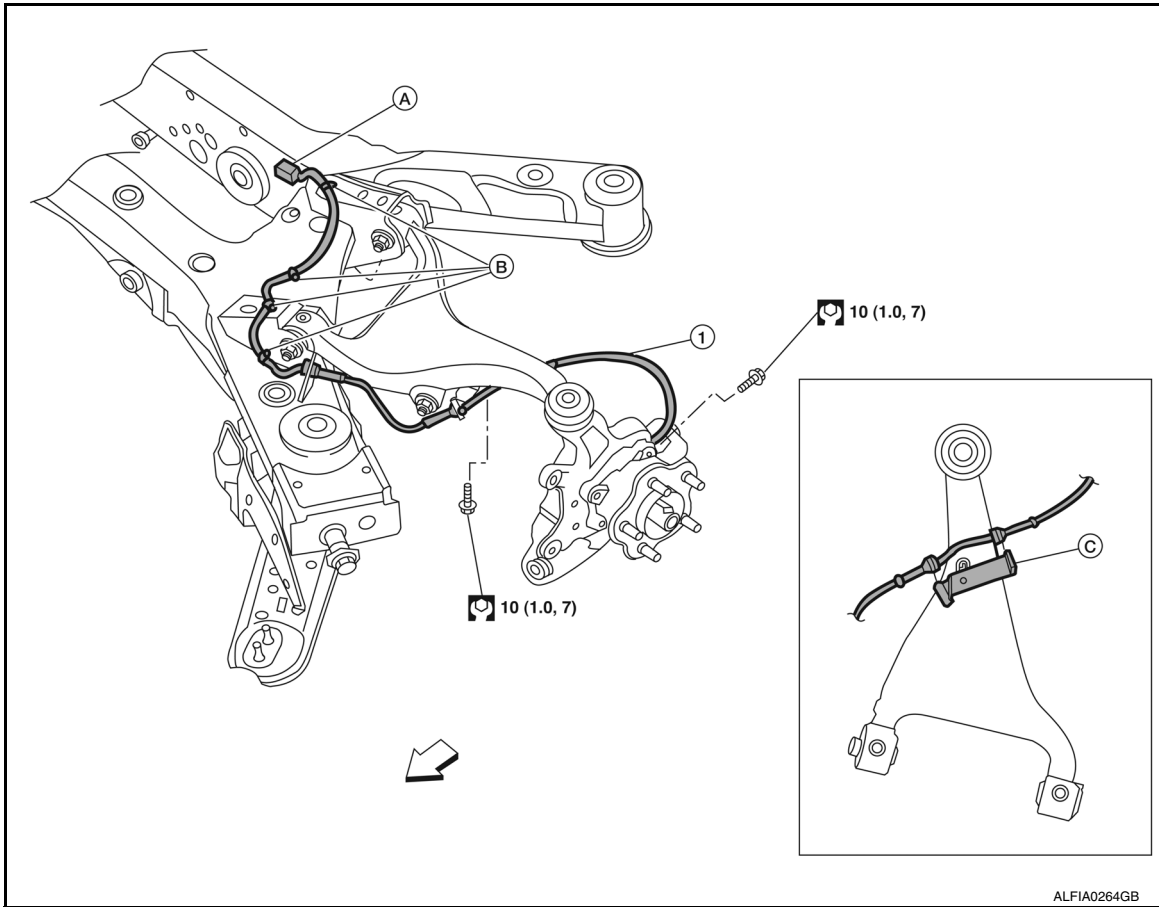
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| 1. Rear wheel sensor | A. Rear wheel sensor bracket | B. Clip |
| C. Rear wheel sensor connector | ↶ Front | |

WHEEL SENSOR

< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

LH Side



- | | | |
|------------------------------|--------------------------------|---------|
| 1. Rear wheel sensor | A. Rear wheel sensor connector | B. Clip |
| C. Rear wheel sensor bracket | ← Front | |

Removal and Installation - Rear Wheel Sensor

INFOID:000000012552070

CAUTION:

- Be careful not to damage rear wheel sensor edge and sensor rotor teeth.
- When removing the rear wheel hub and bearing, first remove the rear wheel sensor from the rear knuckle. Failure to do so may result in damage to the rear wheel sensor wires making the rear wheel sensor inoperative.
- Pull out the rear wheel sensor, being careful to turn it as little as possible. Do not pull on the rear wheel sensor harness.
- Before installation, check if foreign objects such as iron fragments are adhered to the pick-up part of the rear wheel sensor or to the inside of the hole in the rear knuckle for the rear wheel sensor, or if a foreign object is caught in the surface of the mating surface for the sensor rotor. Fix as necessary and then install the rear wheel sensor.

REMOVAL

1. Remove the rear wheel and tire using power tool. Refer to [WT-59. "Adjustment"](#).
2. Remove the rear wheel sensor bolt.
3. Disconnect the rear wheel sensor harness connector.
4. Remove the rear wheel sensor from the sensor brackets.
5. Remove the rear wheel sensor from the rear knuckle.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

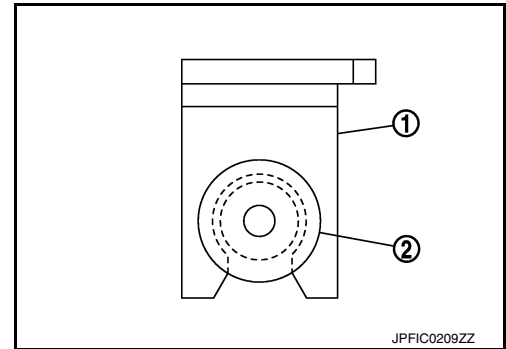
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WHEEL SENSOR

< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

- When installing, make sure there is no foreign material such as iron chips on and in the hole in the rear knuckle for the rear wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- Do not twist rear wheel sensor harness when installing rear wheel sensor. Check that grommet (2) is fully inserted to bracket (1). Check that rear wheel sensor harness is not twisted after installation.



SENSOR ROTOR

< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

SENSOR ROTOR

Removal and Installation - Front Sensor Rotor

INFOID:000000012552071

The front wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to [FAX-8, "Removal and Installation"](#).

Removal and Installation - Rear Sensor Rotor

INFOID:000000012552072

The rear wheel sensor rotor is an integral part of the wheel hub and bearing and cannot be disassembled. Refer to [RAX-7, "Removal and Installation"](#).

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

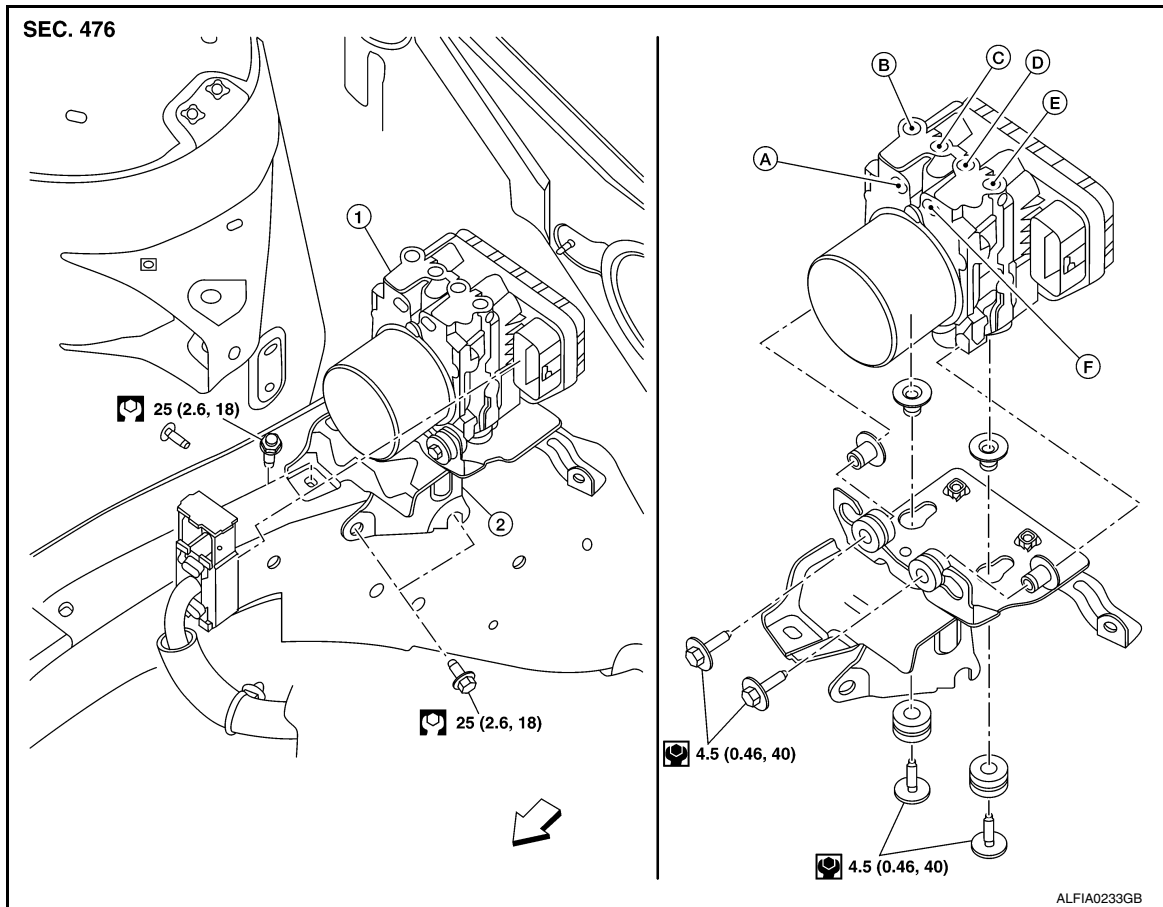
< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:000000012552073



- | | | |
|--|--------------------------------------|--|
| 1. ABS actuator and electric unit (control unit) | 2. Bracket | A. From master cylinder secondary side |
| B. To front RH brake caliper | C. To rear LH brake caliper | D. To rear RH brake caliper |
| E. To front LH brake caliper | F. From master cylinder primary side | ⇐ Front |

Removal and Installation

INFOID:000000012552074

REMOVAL

CAUTION:

- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged.
- Do not remove actuator by holding harness.

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Disconnect negative battery terminal. Refer to [PG-93, "Exploded View"](#).
2. Remove cowl top. Refer to [EXT-25, "Removal and Installation"](#).
3. Disconnect the harness connector from the ABS actuator and electric unit (control unit).
4. Separate brake tubes from ABS actuator and electric unit (control unit). Refer to [BR-22, "FRONT : Exploded View"](#).
5. Remove ABS actuator and electric unit (control unit) bracket bolts.
6. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

Installation is in the reverse order of removal.

- After work is completed, bleed air from brake tube. Refer to [BR-14, "Bleeding Brake System"](#).
- Adjust the neutral position of steering angle sensor. Refer to [BRC-221, "Description"](#).
- Perform calibration of the yaw rate/side/decel G sensor: Refer to [BRC-223, "Description"](#).

CAUTION:

- **To install, use flare nut crowfoot and torque wrench.**
- **Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.**
- **Do not install actuator by holding harness.**
- **After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked.**

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YAW RATE/SIDE/DECEL G SENSOR

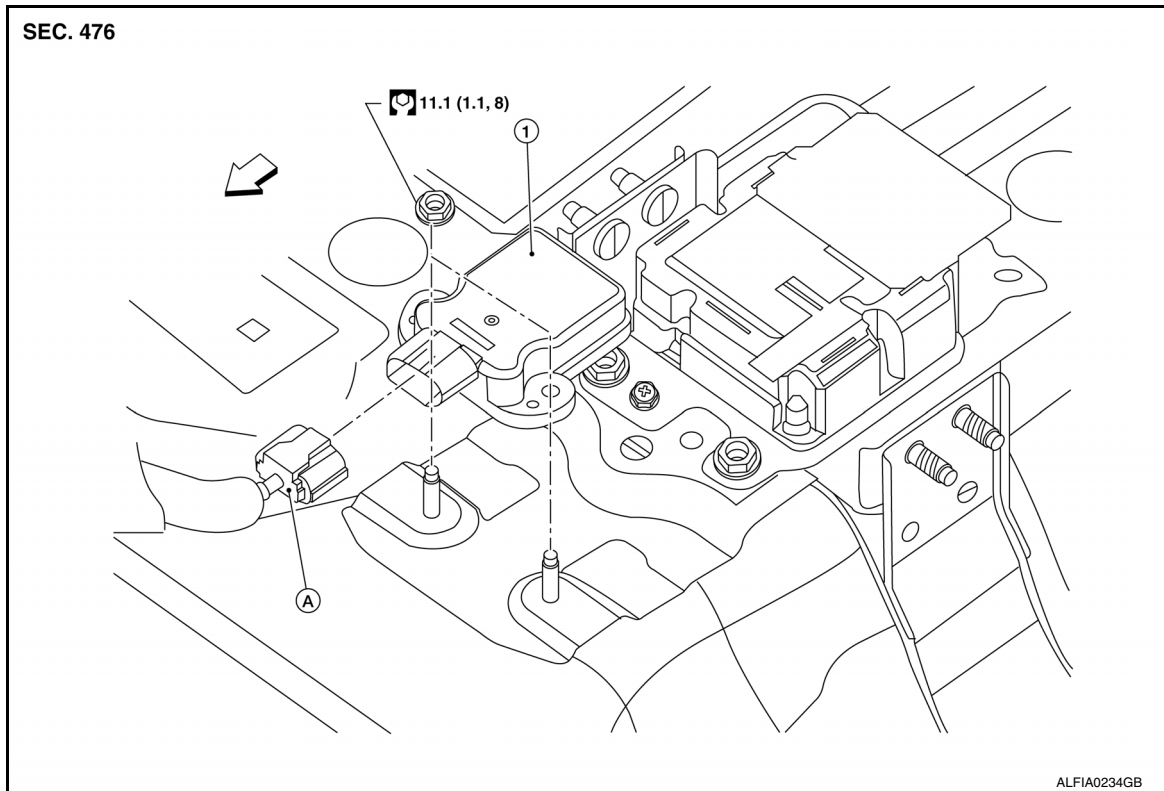
< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

YAW RATE/SIDE/DECEL G SENSOR

Exploded View

INFOID:000000012552075



1. Yaw rate/side/decel G sensor

A. Harness connector

← Front

Removal and Installation

INFOID:000000012552076

REMOVAL

1. Remove the side stay cover from the center console assembly. Refer to [IP-27, "Exploded View"](#).
2. Disconnect the harness connector from the yaw rate/side/decel G sensor.
3. Remove the yaw rate/side/decel G sensor nuts.
4. Remove yaw rate/side/decel G sensor.

INSTALLATION

Installation is in the reverse order of removal.

- Perform calibration of the yaw rate/side/decel G sensor. Refer to [BRC-223, "Description"](#).

CAUTION:

- Do not use power tools on the yaw rate/side/decel G sensor because it is sensitive to the impact.
- Replace the yaw rate/side/decel G sensor if it has been dropped or sustained impact.

STEERING ANGLE SENSOR

< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

STEERING ANGLE SENSOR

Removal and Installation

INFOID:000000012552077

To remove and install the steering angle sensor, remove and install spiral cable. Refer to [SR-15. "Removal and Installation"](#).

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VDC OFF SWITCH

< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

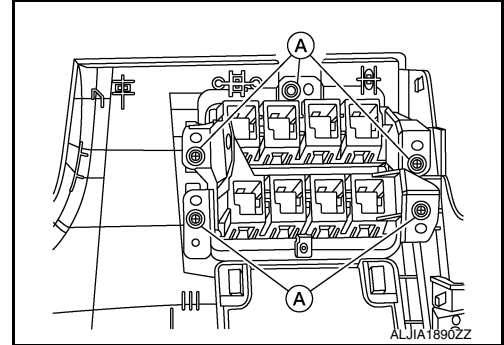
VDC OFF SWITCH

Removal and Installation


INFOID:000000012997321

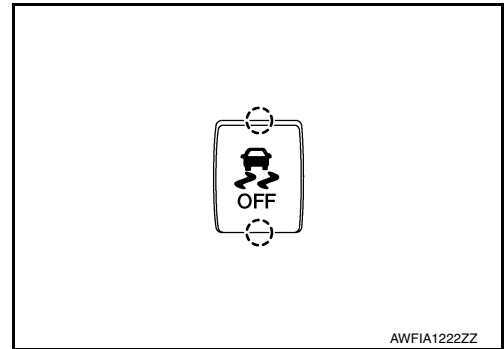
REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-15. "Removal and Installation"](#).
2. Disconnect harness connector from VDC OFF switch.
3. Remove screws (A), then remove switch carrier lower and switch carrier upper from instrument lower panel LH.



4. Using suitable tool, release pawls and remove VDC OFF switch.

 : Pawl



INSTALLATION

Installation is in the reverse order of removal.

HILL DESCENT CONTROL SWITCH

< UNIT REMOVAL AND INSTALLATION >

[TYPE 2]

HILL DESCENT CONTROL SWITCH

Removal and Installation

INFOID:000000012552078

The hill descent control switch is integral part of the 4WD shift switch, to remove and install the hill descent control switch. Refer to [DLN-102. "Removal and Installation"](#).

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