D

Е

CONTENTS

ABS	C1109 POWER AND GROUND SYSTEM	25	BRC
BASIC INSPECTION7	Description DTC Logic		
DIAGNOSIS AND REPAIR WORKFLOW 7	Diagnosis Procedure		G
Work Flow7	C1110, C1113 ABS ACTUATOR AND ELEC-		
Diagnostic Work Sheet9	TRIC UNIT (CONTROL UNIT)		Н
FUNCTION DIAGNOSIS10	DTC Logic Diagnosis Procedure		11
ABS10	C1111 ABS MOTOR, MOTOR RELAY SYS-		ı
System Diagram10	TEM	28	
System Description	Description	28	
Component Parts Location11 Component Description11	DTC Logic		J
Component Description	Diagnosis Procedure		
EBD13	Component Inspection	29	
System Diagram13	C1115 WHEEL SENSOR	30	K
System Description13	Description		1 4
Component Parts Location14	DTC Logic		
Component Description14	Diagnosis Procedure		L
DIAGNOSIS SYSTEM [ABS ACTUATOR	Component Inspection		_
AND ELECTRIC UNIT (CONTROL UNIT)]16	C444C CTOD LAMD CWITCH		
CONSULT-III Function (ABS)16	C1116 STOP LAMP SWITCH		M
,	Description DTC Logic		IVI
COMPONENT DIAGNOSIS19	Diagnosis Procedure		
C1101, C1102, C1103, C1104 WHEEL SEN-	Diagnosis i roccaure	00	Ν
SOR-119	C1120, C1122, C1190 IN ABS SOL		14
Description	Description		
DTC Logic	DTC Logic	34	0
Diagnosis Procedure19	Diagnosis Procedure		0
Component Inspection21	Component Inspection	35	
·	C1121, C1123, C1191 OUT ABS SOL	36	P
C1105, C1106, C1107, C1108 WHEEL SEN-	Description		
SOR-222	DTC Logic		
Description	Diagnosis Procedure	36	
DTC Logic	Component Inspection	37	
Diagnosis Procedure	C1140 ACTUATOR RLY	20	
Component inspection24	Description	ა გ	

DTC Logic		PREPARATION	61
Diagnosis Procedure	38		
Component Inspection	39	PREPARATION	
HARRIS CAN COMM CIRCUIT		Special Service Tool	
U1000 CAN COMM CIRCUIT		Commercial Service Tool	61
Description		DEMOVAL AND INCTALLATION	
DTC Logic		REMOVAL AND INSTALLATION	62
Diagnosis Procedure	40	WHEEL SENSORS	62
ABS WARNING LAMP	<i>1</i> 1	Removal and Installation	
Description		Nemoval and installation	02
Component Function Check		SENSOR ROTOR	63
Diagnosis Procedure		Removal and Installation	63
•		ACTUATOR AND ELECTRIC UNIT (ACCENT	
BRAKE WARNING LAMP		ACTUATOR AND ELECTRIC UNIT (ASSEM-	
Description		BLY)	
Component Function Check	42	Removal and Installation	64
Diagnosis Procedure	42	ABLS/ABS	
ECU DIAGNOSIS	43	BASIC INSPECTION	66
ABS ACTUATOR AND ELECTRIC UNIT		DIAGNOSIS AND REPAIR WORKFLOW	66
(CONTROL UNIT)	. 43	Work Flow	
Reference Value		Diagnostic Work Sheet	68
Wiring Diagram			
Fail-Safe		FUNCTION DIAGNOSIS	69
DTC No. Index		4BL0	
		ABLS	
SYMPTOM DIAGNOSIS	52	System Diagram	
		System Description	
ABS		Component Parts Location	
Symptom Table	52	Component Description	71
EXCESSIVE ABS FUNCTION OPERATION		ABS	. 72
FREQUENCY	5 2	System Diagram	
Diagnosis Procedure		System Description	
Diagnosis Procedure	53	Component Parts Location	
UNEXPECTED PEDAL REACTION	54	Component Description	
Diagnosis Procedure			
		EBD	75
THE BRAKING DISTANCE IS LONG	. 55	System Diagram	75
Diagnosis Procedure	55	System Description	75
ADO FUNOTION DOFO NOT OBED ATE		Component Parts Location	76
ABS FUNCTION DOES NOT OPERATE		Component Description	76
Diagnosis Procedure	56	DIA CNOCIC CYCTEM IABC ACTUATOR	
PEDAL VIBRATION OR ABS OPERATION		DIAGNOSIS SYSTEM [ABS ACTUATOR	
SOUND OCCURS	57	AND ELECTRIC UNIT (CONTROL UNIT)]	
Diagnosis Procedure		CONSULT-III Function (ABS)	78
Diagnosis i roccaure	31	COMPONENT DIAGNOSIS	82
NORMAL OPERATING CONDITION	. 58	COMI CINEINI DIAGNOSIO	02
Description	58	C1101, C1102, C1103, C1104 WHEEL SEN-	
		SOR-1	82
PRECAUTION	59	Description	
DDECAUTIONS		DTC Logic	
PRECAUTIONS	. 59	Diagnosis Procedure	
Precaution for Supplemental Restraint System		Component Inspection	
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-			04
SIONER"		C1105, C1106, C1107, C1108 WHEEL SEN-	
Precaution for Brake System		SOR-2	85
Precaution for Brake Control		Description	
Precaution for CAN System	60		

DTC Logic		C1155 BRAKE FLUID LEVEL SWITCH	109
Diagnosis Procedure		Description	.109
Component Inspection		DTC Logic	
·		Diagnosis Procedure	
C1109 POWER AND GROUND SYSTEM		Component Inspection	
Description		·	-
DTC Logic		C1164, C1165, C1166, C1167 CV/SV SYS-	
Diagnosis Procedure	88	TEM	111
C4440 C4442 C4460 C4470 ADC ACTUA		Description	.111
C1110, C1113, C1160, C1170 ABS ACTUA		DTC Logic	.111
TOR AND ELECTRIC UNIT (CONTROL UNI	•	Diagnosis Procedure	
	90	Component Inspection	
DTC Logic			
Diagnosis Procedure	90	C1187 DIFFERENTIAL LOCK CONTROL	
C1111 ADS MOTOD MOTOD DELAY SVS		UNIT	
C1111 ABS MOTOR, MOTOR RELAY SYS		Description	.114
TEM		DTC Logic	.114
Description		Diagnosis Procedure	.114
DTC Logic		HADOO CAN COMMA CIDOUUT	
Diagnosis Procedure		U1000 CAN COMM CIRCUIT	
Component Inspection	92	Description	
C1115 WHEEL SENSOR	00	DTC Logic	
		Diagnosis Procedure	.115
Description		ADE WADNING LAMP	440
DTC Logic		ABS WARNING LAMP	
Diagnosis Procedure		Description	
Component Inspection	94	Component Function Check	
C1116 STOP LAMP SWITCH	06	Diagnosis Procedure	.116
Description		BRAKE WARNING LAMP	117
·			
DTC Logic		Description	
Diagnosis Procedure	96	Component Function Check	
C1120, C1122, C1124, C1126 IN ABS SOL	97	Diagnosis Procedure	.117
Description		SLIP INDICATOR LAMP	118
DTC Logic		Description	
Diagnosis Procedure		Component Function Check	
Component Inspection		Diagnosis Procedure	
Component inspection		Diagnosis i roccadio	. 1 10
C1121, C1123, C1125, C1127 OUT ABS SO) L.100	ECU DIAGNOSIS	119
Description			
DTC Logic		ABS ACTUATOR AND ELECTRIC UNIT	
Diagnosis Procedure		(CONTROL UNIT)	119
Component Inspection		Reference Value	
·		Wiring Diagram	.123
C1130, C1131, C1136 ENGINE SIGNAL		Fail-Safe	
Description	103	DTC No. Index	
DTC Logic	103		
Diagnosis Procedure	103	SYMPTOM DIAGNOSIS	132
04440 AOTHATOD DIV		ADLO/ADO	
C1140 ACTUATOR RLY		ABLS/ABS	
Description		Symptom Table	.132
DTC Logic		EVCESSIVE ADS SUNCTION ODED ATION	
Diagnosis Procedure		EXCESSIVE ABS FUNCTION OPERATION	4
Component Inspection	105	FREQUENCY	
C4442 DDESS SENSOR	455	Diagnosis Procedure	.133
C1142 PRESS SENSOR		IINEYPECTED DEDA! DEACTION	124
Description		UNEXPECTED PEDAL REACTION	
DTC Logic		Diagnosis Procedure	.134
Diagnosis Procedure		THE BRAKING DISTANCE IS LONG	135
Component Inspection	108		

Diagnosis Procedure135	ADJUSTMENT OF STEERING ANGLE SENSOR
ABS FUNCTION DOES NOT OPERATE 136	NEUTRAL POSITION : Special Repair Require-
Diagnosis Procedure136	
•	CALIBRATION OF DECEL G SENSOR 151
PEDAL VIBRATION OR ABS OPERATION	CALIBRATION OF DECEL G SENSOR: Descrip-
SOUND OCCURS 137	
Diagnosis Procedure137	'
NORMAL OPERATING CONDITION 138	Repair Requirement151
Description	
·	
PRECAUTION139	VDC153
PRECAUTIONS 139	System Diagram153
Precaution for Supplemental Restraint System	System Description153
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	Component Parts Location
SIONER"139	Component Description155
Precaution for Brake System139	
Precaution for Brake Control	
Precaution for CAN System140	-)
·	Component Parts Location 157
PREPARATION141	Component Description158
PREPARATION 141	
Special Service Tool141	7 100
Commercial Service Tool141	System Diagram
Commercial Cervice 1001141	System Description
REMOVAL AND INSTALLATION142	Component Parts Location
	·
WHEEL SENSORS 142	FDIJ162
Removal and Installation142	System Diagram162
SENSOR ROTOR143	System Description162
Removal and Installation143	Component Parts Location163
	Component Description164
ACTUATOR AND ELECTRIC UNIT (ASSEM-	DIAGNOSIS SYSTEM [ABS ACTUATOR
BLY) 144	AND ELECTRIC LIMIT (CONTROL LIMIT)
Removal and Installation144	CONSULT-III Function (ABS)165
VDC/TCS/ABS	CONCOLT III T GIOGOTI (ABO)
BASIC INSPECTION146	COMPONENT DIAGNOSIS170
DAGIO INGI EGITON140	
DIAGNOSIS AND REPAIR WORKFLOW 146	C1101, C1102, C1103, C1104 WHEEL SEN-
Work Flow146	SOR-1
Diagnostic Work Sheet149	Description
INSPECTION AND ADJUSTMENT 150	
INSPECTION AND ADJUSTMENT130	Component Inspection
ADDITIONAL SERVICE WHEN REPLACING	Special Repair Requirement172
CONTROL UNIT150	·
ADDITIONAL SERVICE WHEN REPLACING	C1105, C1106, C1107, C1108 WHEEL SEN-
CONTROL UNIT: Description150	
ADDITIONAL SERVICE WHEN REPLACING	Description
CONTROL UNIT: Special Repair Requirement150	
ADJUSTMENT OF STEERING ANGLE SENSOR	Diagnosis Procedure
NEUTRAL POSITION150	Component Inspection
ADJUSTMENT OF STEERING ANGLE SENSOR	Special Repair Requirement175
NEUTRAL POSITION : Description150	C1109 POWER AND GROUND SYSTEM176
·	Description
	DTC Logic 176

Diagnosis Procedure	176 DTC Logic197	
Special Repair Requirement	177 Diagnosis Procedure197	Α
·	Component Inspection198	
C1110, C1170 ABS ACTUATOR AND ELEC-	Special Repair Requirement198	
TRIC UNIT (CONTROL UNIT)	178	
DTC Logic		В
Diagnosis Procedure		
Special Repair Requirement		
Oposiai respaii resquiromone	Diagnosis Procedure199	С
C1111 ABS MOTOR, MOTOR RELAY SYS-	Component Inspection201	
TEM		
Description	- F	
•	0///0 0//// OTEEDING ANGLE CENCOD	D
DTC Logic	_ '	
Diagnosis Procedure		
Component Inspection		Е
Special Repair Requirement	Diagnosis Procedure202	_
CAAAA CAAAE CAAAC VAW DATE/CIDE/DE	Component Inspection203	
C1113, C1145, C1146 YAW RATE/SIDE/DE-	Special Repair Requirement203	
CEL G SENSOR		BR
Description	B 1 1 1	
DTC Logic	Description205	
Diagnosis Procedure	181 DTC Logic205	0
Component Inspection	182 Diagnosis Procedure205	G
Special Repair Requirement		
	Special Repair Requirement206	
C1115 WHEEL SENSOR	184	Н
Description		
DTC Logic	Daniel de Cara	
Diagnosis Procedure	DTO I '	
Component Inspection	D'accessia Decembra	
	106	
Special Repair Requirement	C1160 DECEL G SEN SET209	
C1116 STOP LAMP SWITCH	187 Description209	J
Description	DTO I	
•	Diamagia Dagaadana	
DTC Logic	-	
Diagnosis Procedure		K
Special Repair Requirement	188 Description210	
C1120, C1122, C1124, C1126 IN ABS SOL	' .	
· · · · · · · · · · · · · · · · · · ·	Diamagia Dagaadaaa	L
Description	100	
DTC Logic		
Diagnosis Procedure	¹⁸⁹ TEM 244	
Component Inspection	190 Description 244	M
Special Repair Requirement	191	
	DTC Logic211	
C1121, C1123, C1125, C1127 OUT ABS SOL.		Ν
Description		IN
DTC Logic	Special Repair Requirement213	
Diagnosis Procedure	192	
Component Inspection	193 C1178, C1181, C1184, C1189 ABS ACTIVE	0
Special Repair Requirement		
oposiai respaii resquirement illiminimi	Description214	
C1130, C1131, C1132, C1133, C1136 EN-	DTC Logic214	
GINE SIGNAL		Р
Description	0 11 0	
·	0 115 15 1	
DTC Logic		
Diagnosis Procedure		
Special Repair Requirement	195 Description217	
C1140 ACTUATOD DI V		
C1140 ACTUATOR RLY	Discount Description	
Description	Diagnosis Procedure217	

Component Inspection21	8 UNEXPECTED PEDAL REACTION	243
Special Repair Requirement21	8 Diagnosis Procedure	. 243
U1000 CAN COMM CIRCUIT 21	9 THE BRAKING DISTANCE IS LONG	244
Description21		
DTC Logic21	9	
Diagnosis Procedure21		245
Special Repair Requirement21		. 245
VDC OFF SWITCH22	0 PEDAL VIBRATION OR ABS OPERATION	
Description22	0 SOUND OCCURS	246
Component Function Check22	0 Diagnosis Procedure	. 246
Diagnosis Procedure22	N	
Component Inspection22	VEHICLE JERKS DURING VDC/TCS/ABS	
ADC WADNING LAMD	CONTROL	
ABS WARNING LAMP	5	. 247
Description		248
Component Function Check	2 December 2	
Diagnosis Procedure22	2	
BRAKE WARNING LAMP22	3 PRECAUTION	249
Description22		240
Component Function Check22	3 Draggution for Cumplemental Postraint System	243
Diagnosis Procedure22	(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	
VDC OFF INDICATOR LAMP 22		
Description22		
Component Function Check22		
Diagnosis Procedure22	Precaution for CAN System	. 250
SLIP INDICATOR LAMP22	5 PREPARATION	251
Description22	5 DDEDARATION	
Component Function Check22	PREPARATION	
Diagnosis Procedure22	Special Service Tool	
ECU DIAGNOSIS22	Commercial Service Tool	. 252
	6 REMOVAL AND INSTALLATION	253
ABS ACTUATOR AND ELECTRIC UNIT	WHEEL SENSORS	253
(CONTROL UNIT)22	Domoval and Installation	
Reference Value22	0	. 200
Wiring Diagram23		254
Fail-Safe	Removal and installation	. 254
DTC No. Index23		
SYMPTOM DIAGNOSIS24	ACTUATOR AND ELECTRIC UNIT (ASSEM- BLY)	
	Democrat and Installation	
VDC/TCS/ABS24	1	
Symptom Table22	OTELINIO ANGLE GENOOR	
EXCESSIVE ABS FUNCTION OPERATION	Removal and Installation	. 257
FREQUENCY 24	² G SENSOR	258
Diagnosis Procedure22	2 Removal and Installation	

[ABS] < BASIC INSPECTION >

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow INFOID:0000000001600828 В

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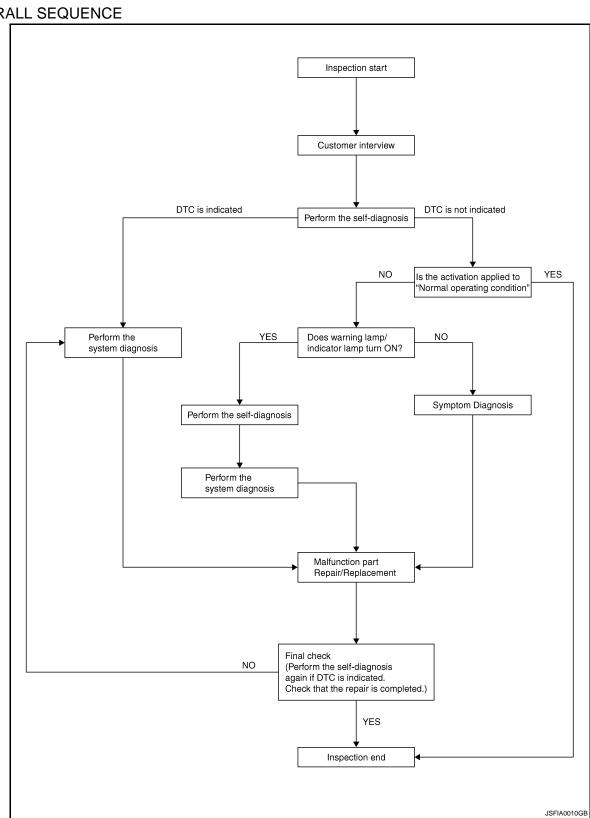
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OVERALL SEQUENCE



DETAIED FLOW

< BASIC INSPECTION > [ABS]

1. COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to BRC-9, "Diagnostic Work Sheet".

>> GO TO 2

2.PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function. Refer to BRC-16, "CONSULT-III Function (ABS)".

Is there any DTC displayed?

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

3. PERFORM THE SYSTEM DIAGNOSIS

Perform the diagnosis applicable to the displayed DTC. Refer to BRC-51, "DTC No. Index".

>> GO TO 7

4. CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCTION

Check that the symptom is a normal operation that is not considered a system malfunction. Refer to <u>BRC-58</u>. "Description".

Is the symptom a normal operation?

YES >> INSPECTION END

NO >> GO TO 5

5. CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.

- ABS warning lamp: Refer to BRC-41, "Description".
- Brake warning lamp: Refer to BRC-42, "Description".

Is ON/OFF timing normal?

YES >> GO TO 6 NO >> GO TO 2

6.PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom.

>> GO TO 7

7.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 8

8. FINAL CHECK

Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, erase the self-diagnosis memory. Refer to <u>BRC-16</u>, "CONSULT-III Function (ABS)".

Is no other DTC present and the repair completed?

YES >> INSPECTION END

NO >> GO TO 3

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

Diagnostic Work Sheet

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INFOID:0000000001600829

Customer name	Model & Year		VIN	
Engine #	Trans.		Mileage	
Incident Date	Manuf. Date		In Service Date	
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ ABS warning lamp activates	☐ Pedal operation ☐ Large stroke pedal operation ☐ Firm pedal	
	ABS does not work (wheels lock when braking)	ABS does not work (wheels slip when braking)	Lack of sense of acceleration	
Engine conditions	☐ When starting ☐ After star	rting		
Road conditions	☐ Low friction road (☐ Snow ☐ G ☐ Bumps/potholes	□ Low friction road (□ Snow □ Gravel □ Other) □ Bumps/potholes		
Driving conditions	Full-acceleration High speed cornering Vehicle speed: Greater than 10 kr Vehicle speed: 10 km/h (6 MPH) o			
Applying brake conditions	☐ Suddenly ☐ Gradually			
Other conditions	☐ Operation of electrical equipment☐ Shift change☐ Other descriptions	t		
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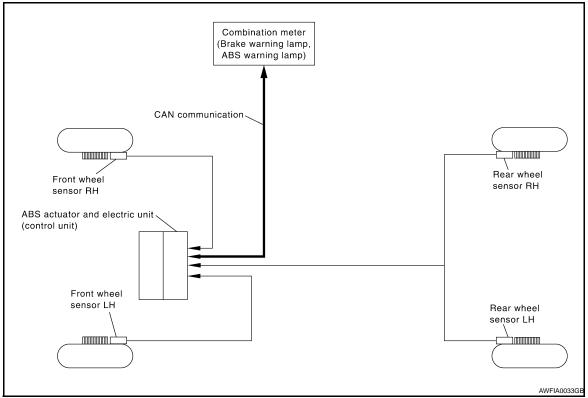
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FUNCTION DIAGNOSIS

ABS

System Diagram

INFOID:0000000001600844



System Description

INFOID:0000000001600845

- Anti-Lock Braking System is a function that detects wheel revolution while braking, electronically controls
 braking force, and prevents wheel locking during sudden braking. It improves handling stability and maneuverability for avoiding obstacles.
- Electrical system diagnosis by CONSULT-III is available.

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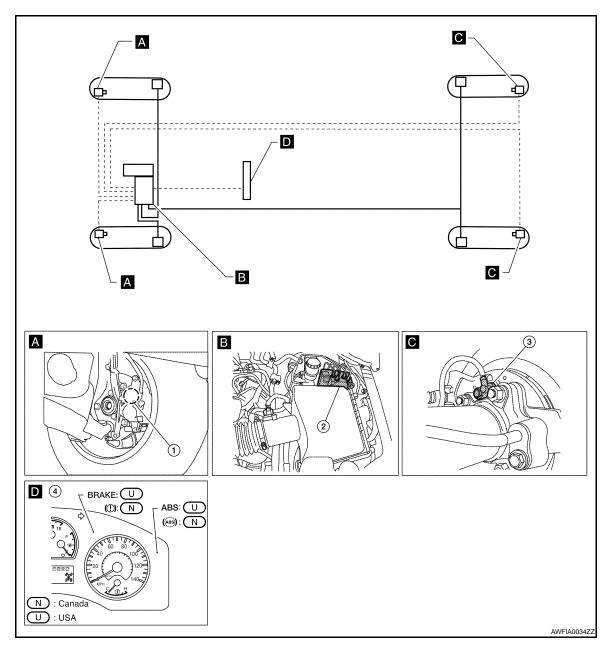
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Component Parts Location

INFOID:0000000001600846



- 1. Front wheel sensor LH E18 RH E117
- 4. Combination meter M24, M25
- 2. ABS actuator and electric unit (con- 3. trol unit) E125
- Rear wheel sensor LH C11 RH C10

Component Description

INFOID:0000000001600847

Compo	nent parts	Reference
ABS actuator and electric unit (control unit)	Pump	BRC-28, "Description"
	Motor	BRC-20, Description
	Actuator relay	BRC-38, "Description"
	Solenoid valve	BRC-34, "Description"
Wheel sensor		BRC-19, "Description"

ABS

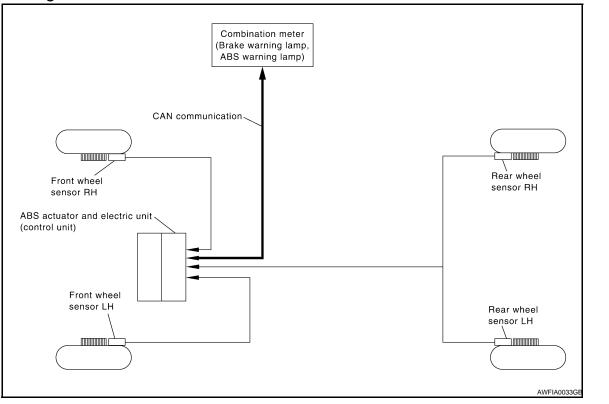
< FUNCTION DIAGNOSIS >

[ABS]

Component parts	Reference
ABS warning lamp	BRC-41, "Description"
Brake warning lamp	BRC-42, "Description"

EBD

System Diagram



System Description

INFOID:0000000001600849

• Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then it electronically controls the rear braking force (brake fluid pressure) to reduce rear wheel slippage. Accordingly, it improves vehicle stability.

• Electrical system diagnosis by CONSULT-III is available.

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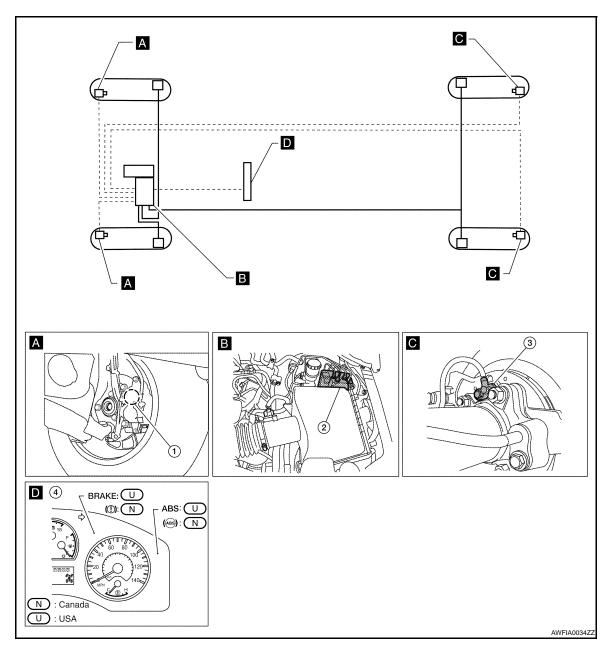
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Component Parts Location

INFOID:0000000001674213



- 1. Front wheel sensor LH E18 RH E117
- 4. Combination meter M24, M25
- ABS actuator and electric unit (control unit) E125
- Rear wheel sensor LH C11 RH C10

Component Description

INFOID:0000000001674214

Compo	nent parts	Reference
ABS actuator and electric unit (control unit)	Pump	BRC-28, "Description"
	Motor	BRC-26, Description
	Actuator relay	BRC-38, "Description"
	Solenoid valve	BRC-34, "Description"
Wheel sensor		BRC-19, "Description"

EBD

< FUNCTION DIAGNOSIS >

[ABS]

Component parts	Reference
ABS warning lamp	BRC-41, "Description"
Brake warning lamp	BRC-42, "Description"

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

< FUNCTION DIAGNOSIS > [ABS]

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

CONSULT-III Function (ABS)

INFOID:0000000001600852

FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.
Self-diagnostic results	Self-diagnostic results 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 is which CONSULT-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.
ECU part number	ABS actuator and electric unit (control unit) part number can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.

SELF-DIAG RESULTS MODE

Operation Procedure

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

How to Erase Self-diagnosis Results

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

CAUTION:

If memory cannot be erased, perform applicable diagnosis. NOTE:

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

Display Item List

Refer to BRC-51, "DTC No. Index".

DATA MONITOR MODE

Display Item List

ltem	Data	a monitor item sele		
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
FR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
FR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
RR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.
RR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.

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

< FUNCTION DIAGNOSIS > [ABS]

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ltem	Data	a monitor item sele	ection	
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	_	×	×	ABS warning lamp (ON/OFF) status is displayed.
FR LH IN SOL (ON/OFF)	_	×	×	Front LH IN ABS solenoid (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	_	×	×	Front LH OUT ABS solenoid (ON/ OFF) status is displayed.
REAR IN SOL (ON/OFF)	_	×	×	Rear IN ABS solenoid (ON/OFF) status is displayed.
REAR OUT SOL (ON/OFF)	_	×	×	Rear OUT ABS solenoid (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	_	×	×	Front RH IN ABS solenoid (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	_	×	×	Front RH OUT ABS solenoid (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	_	×	×	ABS motor relay signal (ON/OFF) status is displayed.
ACTUATOR RLY (ON/OFF)	_	×	×	ABS actuator relay signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	_	_	×	ABS fail signal (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	_	_	×	EBD fail signal (ON/OFF) status is displayed.
EBD SIGNAL (ON/OFF)	_	_	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	-	_	×	ABS operation (ON/OFF) status is displayed.

^{×:} Applicable

ACTIVE TEST

CAUTION:

· Do not perform active test while driving.

- Make sure to completely bleed air from the brake system.
- The ABS and brake warning lamps turn on during the active test.

Solenoid Valve Operation Chart

Operation		ABS solenoid valve			ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
REAR SOL	REAR IN SOL	OFF	ON	ON	OFF	OFF	OFF
KLAK SOL	REAR OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

NOTE:

^{-:} Not applicable

[•] If active test is performed with brake pedal depressed, pedal stroke may change. This is normal.

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

< FUNCTION DIAGNOSIS >

[ABS]

- "TEST IS STOPPED" is displayed approximately 10 seconds after operation starts.
- After "TEST IS STOPPED" is displayed, to perform test again, repeat Step 6.

ABS Motor

Touch "ON" and "OFF" on the screen. Check that ABS motor relay operates as shown in table below.

Operation	ON	OFF
ABS actuator relay	ON	ON
ABS motor relay	ON	OFF

NOTE:

- If active test is performed with brake pedal depressed, pedal stroke may change. This is normal.
- "TEST IS STOPPED" is displayed approximately 10 seconds after operation starts.

[ABS]

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COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description INFOID:0000000001600853

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000001600854

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	Harness or connectorWheel sensor
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-1
RR LH SENSOR-1
FR RH SENSOR-1
FR LH SENSOR-1

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to BRC-19, "Diagnosis Procedure". YES

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector E125 and wheel sensor of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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INFOID:0000000001600855

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< COMPONENT DIAGNOSIS >

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to BRC-62, "Removal and Installation".

3. CHECK TIRES

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

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

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

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and Service" (front) or <u>RAX-5</u>, "On-Vehicle Inspection" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-6</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

${f 5.}$ CHECK WIRING HARNESS FOR SHORT CIRCUIT

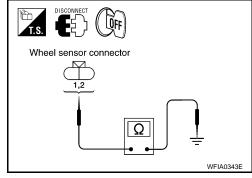
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) harness connector E125 and the malfunctioning wheel sensor harness connector E18, E117, C10, or C11.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	·
Front LH	E125 E125 45 46 34 33 37 36 42 43	45	E18	1	Yes
FIONI LM		46	E10	2	
Front RH		34	E117	1	
		33		2	
Rear LH		C11	2	162	
Real Ln		36	CII	1	
Rear RH		42	C10	2	
		43		1	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-64, "Removal and Installation".

NO >> Repair the circuit.

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[ABS]

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Component Inspection

INFOID:0000000001600856

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)	
FR LH SENSOR		
FR RH SENSOR	Nearly matches the speedometer dis-	
RR LH SENSOR	play (±10% or less)	
RR RH SENSOR		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-19, "Diagnosis Procedure".

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[ABS]

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description INFOID:000000001674215

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
C1106	RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	Harness or connectorWheel sensor
C1107	FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	ABS actuator and electric unit (control unit)
C1108	FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-2
RR LH SENSOR-2
FR RH SENSOR-2
FR LH SENSOR-2

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-22, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001674216

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector E125 and wheel sensor of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[ABS]

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2.check wheel sensor output signal

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

NOTE:

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

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

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to <u>BRC-62</u>, "Removal and Installation".

3. CHECK TIRES

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

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

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

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and Service" (front) or <u>RAX-5</u>, "On-Vehicle Inspection" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-6</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

Wheel sensor connector WFIA0343E

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6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) harness connector E125 and the malfunctioning wheel sensor harness connector E18, E117, C10, or C11.

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[ABS]

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E125	45	E18	1	
FIONI LIT		46		2	
Front RH		34	E117	1	Yes
		33		2	
Rear LH	33	37	C11	2	165
Real Ln		36	CII	1	
Rear RH		42	C10	2	
		43		1	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-64, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

INFOID:0000000001674217

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-22, "Diagnosis Procedure".

< COMPONENT DIAGNOSIS >

[ABS]

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C1109 POWER AND GROUND SYSTEM

Description

Supplies electric power to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1109	BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-25, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001600865

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-16</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

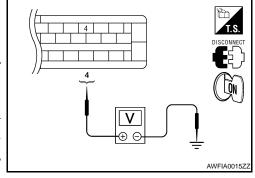
YES >> GO TO 2

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

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

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Turn ignition switch ON or OFF and check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

ABS actuator and elec- tric unit (control unit)		_	Condition	Voltage
Connector	Terminal			
F125	4	Ground	Ignition switch: ON	Battery voltage
L 123	4 Giouria	Ground	Ignition switch: OFF	Approx. 0V



4. Turn ignition switch OFF.

BRC-25

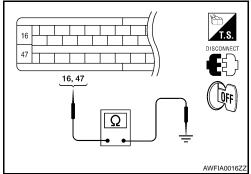
C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[ABS]

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

	ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal		
E125	16, 47	Ground	Yes



Is the inspection result normal?

- YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.
- NO >> Repair or replace malfunctioning components.

C1110, C1113 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [ABS] < COMPONENT DIAGNOSIS > C1110, C1113 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) Α **DTC** Logic INFOID:0000000001600867 DTC DETECTION LOGIC В DTC Malfunction detected condition Possible cause Display item When there is an internal malfunction in the ABS actuator C1110 **CONTROLLER FAILURE** · ABS actuator and electric unit and electric unit (control unit). (control unit) C1113 **G-SENSOR** G-sensor is malfunctioning. D DTC CONFIRMATION PROCEDURE 1. CHECK SELF-DIAGNOSIS RESULTS Check the self-diagnosis results. Self-diagnosis results BRC **CONTROLLER FAILURE G-SENSOR** Is above displayed on the self-diagnosis display? >> Proceed to diagnosis procedure. Refer to BRC-27, "Diagnosis Procedure". YES NO >> INSPECTION END Diagnosis Procedure INFOID:0000000001600868 INSPECTION PROCEDURE 1. REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) >> Replace ABS actuator and electric unit (control unit). Refer to BRC-64, "Removal and Installation". K

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[ABS]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:000000001600870

PUMP

The pump returns the brake fluid stored in the reservoir to the master cylinder by reducing the pressure.

MOTOR

The motor drives the pump according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1111	PUMP MOTOR	During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open.	Harness or connector ABS actuator and electric unit
OTT	T GIVII WOTOK	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	(control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-28, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001600872

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-16</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

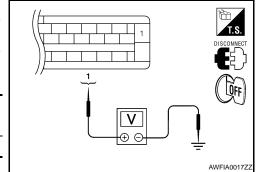
C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[ABS]

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

ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector	Terminal		voltage
E125	1	Ground	Battery voltage



Is the inspection result normal?

>> GO TO 3 YES

NO >> Repair or replace malfunctioning components.

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

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

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-64, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

16, 47

Component Inspection

1. CHECK ACTIVE TEST

- On "ACTIVE TEST", select "ABS MOTOR".
- Touch ON and OFF on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-28</u>, "<u>Diagnosis Procedure</u>".

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C1115 WHEEL SENSOR

Description INFOID:000000001600880

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	Harness or connector Wheel sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

ABS SENSOR [ABNORMAL SIGNAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-30, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001674218

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector E125 and wheel sensor of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to BRC-62, "Removal and Installation".

3.CHECK TIRES

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

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

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

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and <u>Service</u>" (front) or <u>RAX-5</u>, "On-Vehicle Inspection" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-6</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

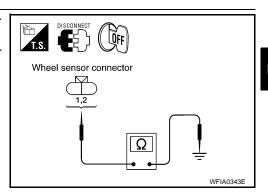
- Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) harness connector E125 and the malfunctioning wheel sensor harness connector E18, E117, C10, or C11.

Wheel sensor	ABS actuato electric unit (cor		Wheel sen	sor	Continuity
	Connector	Terminal	Connector	Terminal	
Front LH		45	E18	1	Yes
FIORICH		46	46	2	
Front RH Rear LH	E125	34	E117	1	
		33		2	
		37	C11	2	
		36	011	1	
Rear RH		42	C10	2	
		43	C10	1	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-64, "Removal and Installation"</u>.

NO >> Repair the circuit.

Component Inspection

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
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C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS > [ABS]

FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-30, "Diagnosis Procedure".

[ABS]

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C1116 STOP LAMP SWITCH

Description

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1116	STOP LAMP SW	When stop lamp switch circuit is open.	Harness or connector Stop lamp switch ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-33</u>. "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- Disconnect the ABS actuator and electric unit (control unit) connector E125 and stop lamp switch connector E38.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

$2.\mathsf{stop}$ Lamp switch inspection

Check the voltage between the ABS actuator and electric unit (control unit) harness connector E125 terminal 41 and body ground.

Brake pedal depressed : Battery voltage

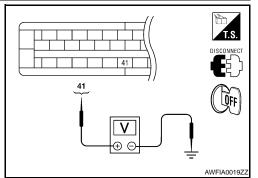
(approx. 12V)

Brake pedal not depressed : Approx. 0V

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-64, "Removal and Installation".

NO >> Refer to EXL-3, "Work Flow".



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C1120, C1122, C1190 IN ABS SOL

Description INFOID:000000001600889

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1120	FR LH IN ABS SOL	When the control unit detects a malfunction in the front LH inlet solenoid circuit.	
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	ABS actuator and electric unit (control unit)
C1190	R-EV	When the control unit detects a malfunction in the rear inlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH IN ABS SOL
FR RH IN ABS SOL
R-EV

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-34, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001600891

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-16</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

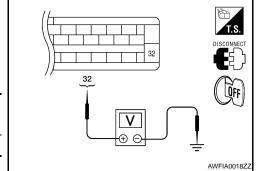
NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

< COMPONENT DIAGNOSIS >

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

ABS actuator and ele	ectric unit (control unit)	_	Voltage	
Connector	Terminal		voltage	
E125	32	Ground	Battery voltage	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

${f 3.}$ CHECK SOLENOID AND ACUATOR RELAY GROUND CIRCUIT

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

ABS actuator and ele	ectric unit (control unit)	— Continuity	
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-64, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

16, 47

INFOID:0000000001600892

Component Inspection

1. CHECK ACTIVE TEST

- Select each test menu item on "ACTIVE TEST".
- On the display, touch "UP", "KEEP", and "DOWN", and check that the system operates as shown in the table below.

Operation		ABS solenoid valve		ABS solenoid valve (ACT)			
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
NEAN SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-34, "Diagnosis Procedure".

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DIAGNOSIS > [ABS]

C1121, C1123, C1191 OUT ABS SOL

Description INFOID:000000001600894

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1121	FR LH OUT ABS SOL	When the control unit detects a malfunction in the front LH outlet solenoid circuit.	
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	ABS actuator and electric unit (control unit)
C1191	R-AV	When the control unit detects a malfunction in the rear outlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH OUT ABS SOL
FR RH OUT ABS SOL
R-AV

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-36, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001674220

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-16, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

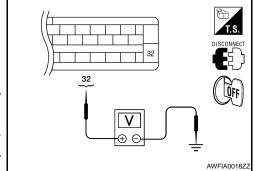
C1121, C1123, C1191 OUT ABS SOL

< COMPONENT DIAGNOSIS >

Turn ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connec-
- 3. Check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal		voltage
E125	32	Ground	Battery voltage



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

${f 3.}$ CHECK SOLENOID AND ACUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-64, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

16, 47

INFOID:0000000001674221

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Component Inspection

1. CHECK ACTIVE TEST

- Select each test menu item on "ACTIVE TEST".
- On the display, touch "UP", "KEEP", and "DOWN", and check that the system operates as shown in the table below.

Operation		ABS solenoid valve		ABS solenoid valve (ACT)			
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
NEAN SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-36, "Diagnosis Procedure".

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C1140 ACTUATOR RLY

Description INFOID:000000001600903

Activates or deactivates each solenoid valve according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	ABS actuator relay or circuit malfunction.	Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
ACTUATOR RLY	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-38, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001674222

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-16, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

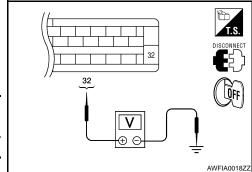
NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

Turn ignition switch OFF.

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

ABS actuator and electric unit (control unit)		_	Voltage
Connector	Terminal		voltage
E125	32	Ground	Battery voltage



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK SOLENOID AND ACUATOR RELAY GROUND CIRCUIT

C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

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

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

16, 47 16, 47 AWFIA0016ZZ

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-64</u>, "<u>Removal and Installation</u>".

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000001600906

1. CHECK ACTIVE TEST

- On "ACTIVE TEST", select "ABS MOTOR".
- 2. Touch ON and OFF on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-38</u>, "<u>Diagnosis Procedure</u>".

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U1000 CAN COMM CIRCUIT

Description INFOID:000000001600947

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	CAN communication line ABS actuator and electric unit (control unit)

Diagnosis Procedure

INFOID:0000000001600949

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
- 2. Reconnect connector and perform self-diagnosis.

Is "CAN COMM CIRCUIT" displayed in self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> Connector terminal is loose, damaged, open, or shorted.

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ABS WARNING LAMP

Description

×: ON –: OFF

Condition	ABS warning lamp
Ignition switch OFF	-
For 1 second after turning ON ignition switch	×
1 second later after turning ON ignition switch	-
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000001600956

1. CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-41, "Diagnosis Procedure".

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Diagnosis Procedure

1. CHECK SELF-DIAGNOSIS

INFOID:0000000001600957

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-16</u>, "CONSULT-III Function (ABS)".

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-26, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-64, "Removal and Installation"</u>.

NO >> Replace combination meter. Refer to MWI-72, "Removal and Installation".

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BRAKE WARNING LAMP

Description INFOID:000000001600958

 \times : ON -: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
For 1 second after turning ON ignition switch	× (Note 2)
1 second later after turning ON ignition switch	× (Note 2)
EBD function is malfunctioning.	×

NOTE:

- 1: Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- · 2: After starting engine, brake warning lamp is turned off.

Component Function Check

INFOID:0000000001600959

1.BRAKE WARNING LAMP OPERATION CHECK

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-42, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000001600960

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-16, "CONSULT-III Function (ABS)"</u>.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-26, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-64, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-72, "Removal and Installation".

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS > [ABS]

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ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

	MONITOR	

		Data monitor		. D
Monitor item	Display content	Condition	Reference value in normal operation	Е
		0 [km/h (MPH)]	Vehicle stopped	
FR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	BF
		0 [km/h (MPH)]	Vehicle stopped	
FR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	G
		0 [km/h (MPH)]	Vehicle stopped	-
RR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	F
		0 [km/h (MPH)]	Vehicle stopped	-
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
STOP LAMP SW	Stop Jamp switch signal status	When brake pedal is depressed	ON	-
STOP LAWIP SW	Stop lamp switch signal status	When brake pedal is released	OFF	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	- 0
FR RH IN SOL	Operation status of each calculated value	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	K
FR RH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	L
FR RH OUT SOL	Operation status of each colonoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	N
FR RH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	Ν
ED I H IN COL	Operation status of each calenaid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	C
FR LH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	Р
ED I II OUT SOI	Operation status of each colonoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	-
FR LH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	=

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

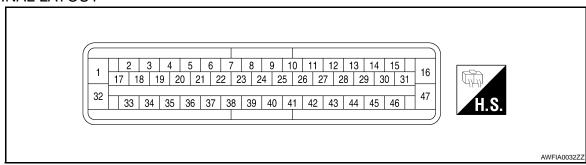
< ECU DIAGNOSIS > [ABS]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
REAR IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
REAR IN SOL	Operation status of each solehold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
REAR OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
REAR OUT SOL	Operation status of each solehold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	ON
ACTUATOR REI	Actuator relay operation	When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	ON
ABS WARIN LAWIP	(Note 2)	When ABS warning lamp is OFF	OFF
EBD SIGNAL	EBD operation	EBD is active	ON
EBD SIGNAL	EBD operation	EBD is inactive	OFF
ABS SIGNAL	ABS operation	ABS is active	ON
ABS SIGNAL	Abs operation	ABS is inactive	OFF
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	ON
LDD I AIL OIG	LDD Ian Sale Signal	EBD is normal	OFF
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	ON
ABO I AIL GIO	ADO Idii Sale Signal	ABS is normal	OFF

NOTE:

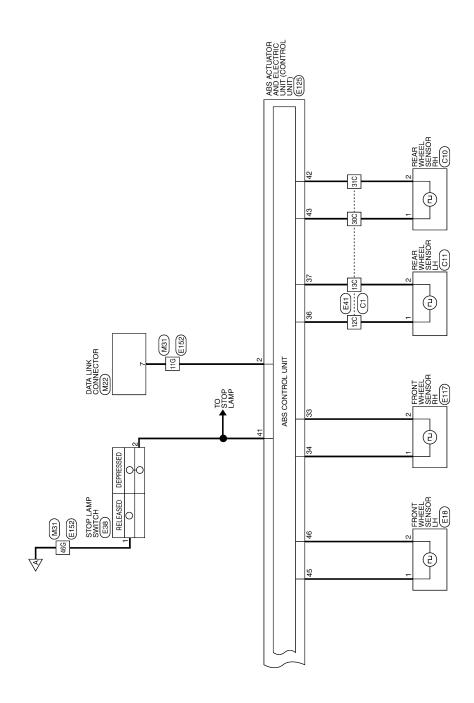
- 1: Confirm tire pressure is normal.
- 2: On and off timing for warning lamp and indicator lamp. Refer to BRC-41, "Description".

TERMINAL LAYOUT



[ABS] < ECU DIAGNOSIS > Wiring Diagram INFOID:0000000001600968 Α ■ : DATA LINE В C IPDM E/R I(INTELLIGENT POWER DISTRIBUTION MODLE ENGINE ROOM) D Е 10A BRC Sen Shear Sout COMBINATION METER (M24), (M25) G UNIFIED METER CONTROL UNIT (WITH INFORMATION DISPLAY) John Jan Н ABS CONTROL UNIT (Meo **★**) ABS **★**) BRAKE FUSE BLOCK (J/B) (M4), (M39), (, (M39) رسٍ IGNITION SWITCH ON OR START 10A J M31 E152 10A K 10A 20 **BRAKE CONTROL SYSTEM - ABS** L 30A H M MOTOR ₩<u></u> BATTERY Ν 0

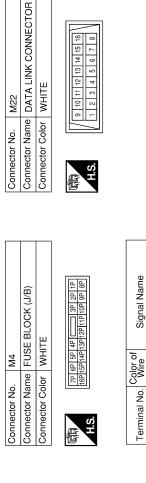
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[ABS] < ECU DIAGNOSIS >

BRAKE CONTROL SYSTEM - ABS CONNECTORS



Signal Name	ı	I	CAN-H	CAN-L	1
Color of Wire	Y/R	В	_	۵	J/O
Terminal No. Wire	8	6	+	12	24

Signal Name K-LINE

Color of Wire G/W

Terminal No.

٦/O

5P

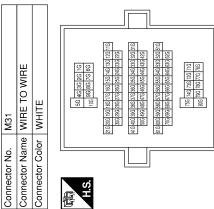
Connector Name | COMBINATION METER

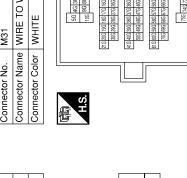
Connector No. M24

WHITE

Connector Color

CAN-L	ı		Signal Name	ı	Ī	I	ı
Ь	O/L		Color of Wire	G/W	_	Д	Ρ/Υ
12	24		Terminal No. Wire	11G	31G	42G	46G





45 44 43 42 41 52 51 50 49 48 47	Signal Name	-	
46 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Color of Wire	В	
南 H.S.	Terminal No.	52	

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Connector Name COMBINATION METER

M25

Connector No.

Connector Color WHITE

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Signal Name

Terminal No. Wire

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Connector No. E18 Connector Name FRONT WHEEL SENSOR LH Connector Color GRAY	H.S.	Terminal No. Color of Signal Name 1 G/O -	Connector No. E41
Connector No. M60 Connector Name FUSE BLOCK (J/B) Connector Color WHITE	(五)	Terminal No. Wire Signal Name	Connector No. E38 Connector Name STOP LAMP SWITCH (COLUMN SHIFT) Connector Color WHITE #1.S. Terminal No. Wire Signal Name
Connector No. M39 Connector Name FUSE BLOCK (J/B) Connector Color WHITE	(所) 30 (三) 20 10 (30 70 60 50 40 H.S.	Terminal No. Color of Wire Signal Name 4Q Y/R –	Connector No. E38 Connector Name STOP LAMP SWITCH (FLOOR SHIFT) Connector Color BLACK LS. E1 Signal Name Terminal No. Wire Signal Name

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[ABS] < ECU DIAGNOSIS >

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

E119

Connector No.

Connector Name

Connector Name FRONT WHEEL SENSOR RH

E117

Connector No.

Connector Color GRAY

WHITE

Connector Color

ABS IGN SUPPLY

Signal Name

Color of Wire GR

Terminal No. 15

Signal Name

Terminal No.

B/R BR

N

Signal Name	DP-RL	DS_RL	STOP_LAMP_SWITCH	DS_RR	DP_RR	DP_FL	DS_FL	MOTOR_GND
Color of Wire	_	Ь	R/G	>	G/Y	G/0	BR/W	В
Terminal No.	36	37	41	42	43	45	46	47

Signal Name	MOTOR_SUPPLY	DIAG_K	IGN	CAN-H	CAN-L	GND	VALVE_ECU_SUPPLY	DS_FR	DP_FR
Color of Wire	Β/Y	۵	GR	٦	А	В	>	BR	B/R
Terminal No.	-	2	4	11	15	16	32	33	34

Connector No.	E125
Connector Name	Connector Name ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color BLACK	BLACK

32 33 34 35 37 38 39 40 41 42 43 44 45 46		ш	-	~		ш
	H.S.		2 3 4 5 6 7 8 9 10 11 12 13 14 15 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	—		
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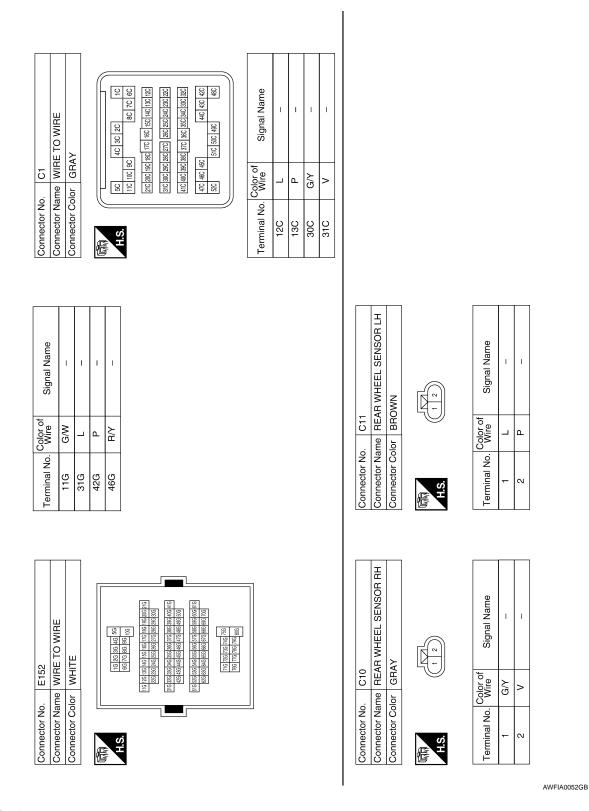
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Fail-Safe

CAUTION:

If the Fail-Safe function is activated, perform Self Diagnosis for ABS system.

ABS/EBD SYSTEM

In case of an electrical malfunction with the ABS, the ABS warning lamp will turn on. In case of an electrical malfunction with the EBD system, the BRAKE warning lamp and ABS warning lamp will turn on.

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[ABS] < ECU DIAGNOSIS >

The system will revert to one of the following conditions of the Fail-Safe function.

1. For ABS malfunction, only the EBD is operative and the condition of the vehicle is the same condition of vehicles without ABS system.

2. For EBD malfunction, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without ABS or EBD system.

DTC No. Index INFOID:0000000001600970

		T	
	Reference	Items (CONSULT screen terms)	DTC
		RR RH SENSOR-1	C1101
D	BRC-19, "Description"	RR LH SENSOR-1	C1102
	<u> Dice-19, Description</u>	FR RH SENSOR-1	C1103
Е		FR LH SENSOR-1	C1104
		RR RH SENSOR-2	C1105
	BRC-22, "Description"	RR LH SENSOR-2	C1106
BRC	BRC-22, Description	FR RH SENSOR-2	C1107
		FR LH SENSOR-2	C1108
G	BRC-25, "Description"	BATTERY VOLTAGE [ABNORMAL]	C1109
	BRC-27, "DTC Logic"	CONTROLLER FAILURE	C1110
	BRC-28, "Description"	PUMP MOTOR	C1111
Н	BRC-27, "DTC Logic"	G-SENSOR	C1113
	BRC-30, "Description"	ABS SENSOR [ABNORMAL SIGNAL]	C1115
	BRC-33, "Description"	STOP LAMP SW	C1116
	BRC-34, "Description"	FR LH IN ABS SOL	C1120
	BRC-36, "Description"	FR LH OUT ABS SOL	C1121
J	BRC-34, "Description"	FR RH IN ABS SOL	C1122
	BRC-36, "Description"	FR RH OUT ABS SOL	C1123
	BRC-38, "Description"	ACTUATOR RLY	C1140
— K	BRC-34, "Description"	REAR IN ABS SOL	C1190
	BRC-36, "Description"	REAR OUT ABS SOL	C1191
L	BRC-40, "Description"	CAN COMM CIRCUIT	U1000

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SYMPTOM DIAGNOSIS

ABS

Symptom Table

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

Symptom	Check item	Reference	
	Brake force distribution		
Excessive ABS function operation frequency	Looseness of front and rear axle	BRC-53, "Diagno- sis Procedure"	
4	Wheel sensor and rotor system	<u> </u>	
Unexpected pedal reaction	Brake pedal stroke	BRC-54, "Diagno-	
Onexpected pedal reaction	Make sure the braking force is sufficient when the ABS is not operating.	sis Procedure"	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-55, "Diagno- sis Procedure"	
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-56, "Diagno- sis Procedure"	
Pedal vibration or ABS operation sound	Brake pedal	BRC-57, "Diagno-	
occurs (Note 2)	ABS actuator and electric unit (control unit)	sis Procedure"	

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

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

[ABS] < SYMPTOM DIAGNOSIS > **EXCESSIVE ABS FUNCTION OPERATION FREQUENCY** Α Diagnosis Procedure INFOID:0000000001600972 1.CHECK START В Check front and rear brake force distribution using a brake tester. Is the inspection result normal? YES >> GO TO 2 NO >> Check brake system. 2.CHECK FRONT AND REAR AXLE D Make sure that there is no excessive play in the front and rear axles. Refer to front: FAX-5, "On-Vehicle Inspection and Service", Rear: RAX-5, "On-Vehicle Inspection". Is the inspection result normal? Е YES >> GO TO 3 NO >> Repair or replace malfunctioning components. 3.CHECK WHEEL SENSOR AND SENSOR ROTOR **BRC** Check the following. Wheel sensor installation for damage. Sensor rotor installation for damage. Wheel sensor connector connection. · Wheel sensor harness inspection. Is the inspection result normal? Н YES >> GO TO 4 NO >> • Replace wheel sensor or sensor rotor. Refer to BRC-62, "Removal and Installation". Repair harness. 4. CHECK ABS WARNING LAMP DISPLAY Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving. Is the ABS warning lamp illuminated? YES >> Perform self-diagnosis. Refer to BRC-16, "CONSULT-III Function (ABS)". NO >> Normal K L M Ν Р

MIDIAGNOSIS > [ABS]

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000001600973

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-14, "Inspection and Adjustment".

Is the stroke too large?

YES

- >> Bleed air from brake tube and hose. Refer to <u>BR-16</u>, "<u>Bleeding Brake System"</u>.
 - Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to <u>BR-14</u>. "<u>Inspection and Adjustment</u>" (brake pedal), <u>BR-11</u>. "<u>On Board Inspection</u>" (master cylinder), <u>BR-10</u>. "<u>Inspection</u>" (brake booster).

NO >> GO TO 2

2. CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

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THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

CAUTION:

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

1. CHECK FUNCTION

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

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ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS > [ABS]

INFOID:0000000001600975

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

CAUTION:

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

1. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving. Is the inspection result normal?

YES >> Normal

NO >> Perform self-diagnosis. Refer to BRC-16, "CONSULT-III Function (ABS)".

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

[ABS] < SYMPTOM DIAGNOSIS > PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS Α Diagnosis Procedure INFOID:0000000001600976 **CAUTION:** В Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal. When shifting gears When driving on slippery road During cornering at high speed When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more] When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher] D 1.SYMPTOM CHECK 1 Check that there are pedal vibrations when the engine is started. Е Do vibrations occur? YES >> GO TO 2 NO >> Inspect the brake pedal. BRC 2.SYMPTOM CHECK 2 Check that there are ABS operation noises when the engine is started. Do the operation noises occur? YES >> GO TO 3 NO >> Perform self -diagnosis. Refer to BRC-16, "CONSULT-III Function (ABS)". Н 3.SYMPTOM CHECK 3 Check symptoms when electrical component (headlamps, etc.) switches are operated. Do symptoms occur? YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away. NO >> Normal J K L M Ν Р

NORMAL OPERATING CONDITION

[ABS]

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description INFOID:000000001600978

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

< PRECAUTION > [ABS]

PRECAUTION

PRECAUTIONS

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

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

WARNING:

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

Precaution for Brake System

CAUTION:

- Always use recommended brake fluid. Refer to MA-10, "Fluids and Lubricants".
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- If a brake fluid leak is found, the part must be disassembled without fail. Then it has to be replaced with a new one if a defect exists.
- Turn the ignition switch OFF and remove the connector of the ABS actuator and electric unit (control unit) or the battery terminal before performing the work.
- Always torque brake lines when installing.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

Refer to <u>BR-35, "Brake Burnishing Procedure"</u> (front disc brake) or <u>BR-40, "Removal and Installation of Brake Pad"</u> (rear disc brake).

WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precaution for Brake Control

- During ABS operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is normal.
- Just after starting vehicle, the brake pedal may vibrate or a motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

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< PRECAUTION > [ABS]

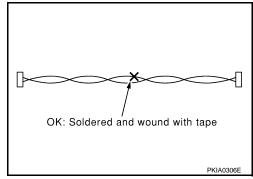
• When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnosis. Besides electrical system inspection, check booster operation, brake fluid level, and fluid leaks.

- If incorrect tire sizes or types are installed on the vehicle or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna or related wiring near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits or improper wiring.

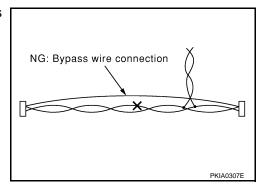
Precaution for CAN System

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- Do not apply voltage of 7.0V or higher to terminal to be measured.
- Maximum open terminal voltage of tester in use must be less than 7.0V.
- Before checking harnesses, turn ignition switch OFF and disconnect battery negative cable.
- Area to be repaired must be soldered and wrapped with tape.
 Make sure that fraying of twisted wire is within 110 mm (4.33 in).



 Do not make a bypass connection to repaired area. (If the circuit is bypassed, characteristics of twisted wire will be lost.)



[ABS] < PREPARATION >

PREPARATION

PREPARATION

Special Service Tool

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

Tool number (Kent-Moore No.) Tool name		Description	С
— (J-45741) ABS active wheel sensor tester	J-45741-BOX O C POWER SIMBUR	Checking operation of ABS active wheel sensors	D E BRO
ST30031000		Removing axle shaft bearing	
Bearing splitter			G
	ZZA0700D		Н

Commercial Service Tool

Tool name		Description
Flare nut crowfoot Torque wrench		Removing and installing brake piping a: 10mm (0.39 in)/12mm (0.47 in)
	S-NT360	

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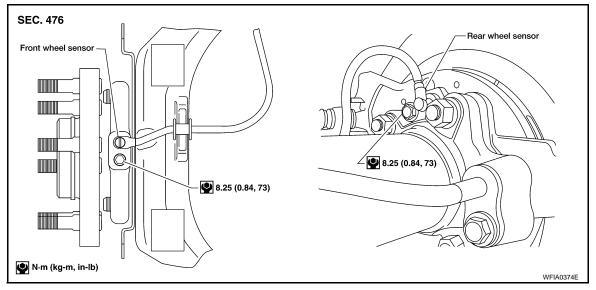
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REMOVAL AND INSTALLATION

WHEEL SENSORS

Removal and Installation





REMOVAL

- 1. Remove wheel sensor bolt.
 - When removing the front wheel sensor, first remove the disc rotor to gain access to the front wheel sensor bolt. Refer to <u>BR-34</u>, "Removal and Installation of Brake Caliper and Disc Rotor".
- 2. Pull out the sensor, being careful to turn it as little as possible.

CAUTION:

- Be careful not to damage sensor edge and sensor rotor teeth.
- Do not pull on the sensor harness.
- 3. Disconnect wheel sensor harness electrical connector, then remove harness from mounts.

INSTALLATION

Installation is in the reverse order of removal. Tighten wheel sensor bolt to specification.

CAUTION:

Installation should be performed while paying attention to the following:

- Inspect wheel sensor O-ring, replace sensor assembly if damaged.
- Clean wheel sensor hole and mounting surface with brake cleaner and a lint-free shop rag. Be careful that dirt and debris do not enter the axle.
- Apply a coat of suitable grease to the wheel sensor O-ring and mounting hole. Refer to MA-10, "Fluids and Lubricants".

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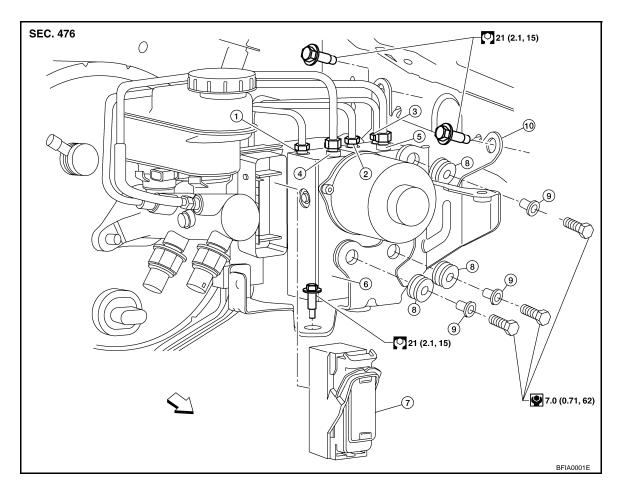
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ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation



- Brake tube to rear left cylinder body
- 4. From the master cylinder secondary side
- 7. Harness connector
- 10. Bracket

- Brake tube to front left cylinder 3. body
- 5. From the master cylinder pri- 6. mary side
- 8. Grommet
- ←: Front

- Brake tube to front right cylinder body
- ABS actuator and electric unit (control unit)
- 9. Collar

REMOVAL

- 1. Disconnect the battery negative terminal.
- 2. Remove the cowl top extension. Refer to EXT-19, "Removal and Installation".
- 3. Drain the brake fluid. Refer to BR-16, "Drain and Refill".
- Disconnect the actuator harness connector from the ABS actuator and electric unit (control unit).
 CAUTION:
 - To remove the brake tubes, use a flare nut crowfoot and torque wrench to prevent the flare nuts and brake tubes from being damaged.
 - Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- 5. Disconnect the brake tubes.
- 6. Remove the three bolts and remove the ABS actuator and electric unit (control unit).

INSTALLATION

Installation is in the reverse order of removal.

NOTE:

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< REMOVAL AND INSTALLATION >

[ABS]

To install, use a flare nut crowfoot and torque wrench. Tighten brake tubes to specification when installing. Refer to <u>BR-12</u>, "<u>Hydraulic Circuit</u>".

 After installation of the ABS actuator and electric unit (control unit), refill the brake system with new brake fluid. Refer to MA-10, "Fluids and Lubricants". Then bleed the air from the system. Refer to BR-16, "Bleeding Brake System".

CAUTION:

Never reuse drained brake fluid.

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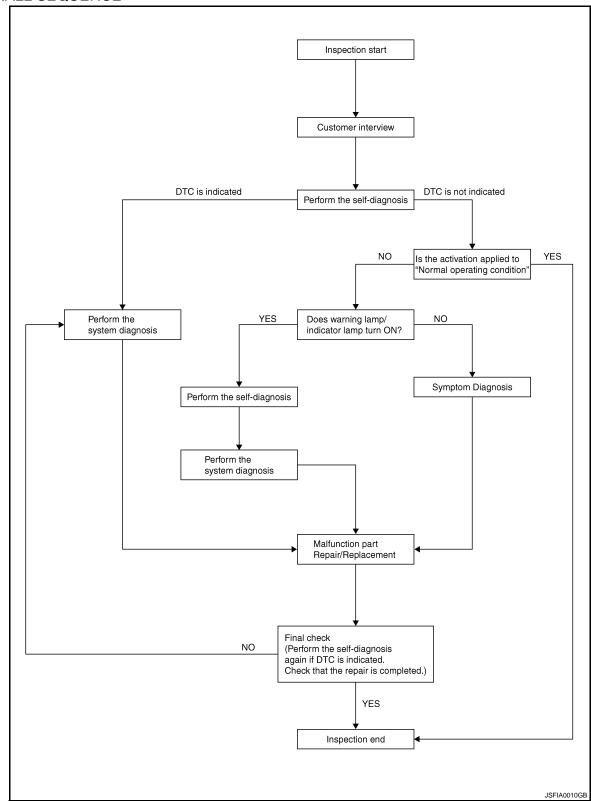
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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

OVERALL SEQUENCE



DIAGNOSIS AND REPAIR WORKFLOW

[ABLS/ABS] < BASIC INSPECTION > 1. COLLECT THE INFORMATION FROM THE CUSTOMER Α Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to BRC-68, "Diagnostic Work Sheet". В >> GO TO 2 2.PERFORM THE SELF-DIAGNOSIS Check the DTC display with the self-diagnosis function. Refer to BRC-78, "CONSULT-III Function (ABS)". Is there any DTC displayed? YES >> GO TO 3 D NO >> GO TO 4 3.PERFORM THE SYSTEM DIAGNOSIS Perform the diagnosis applicable to the displayed DTC. Refer to BRC-130, "DTC No. Index". >> GO TO 7 **BRC** f 4.CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCTION Check that the symptom is a normal operation that is not considered a system malfunction. Refer to BRC-138. "Description". Is the symptom a normal operation? >> INSPECTION END YES NO >> GO TO 5 Н ${f 5.}$ CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION Check that the warning lamp and indicator lamp illuminate. ABS warning lamp: Refer to <u>BRC-116</u>, "<u>Description</u>". Brake warning lamp: Refer to BRC-117, "Description". SLIP indicator lamp: Refer to BRC-118, "Description". Is ON/OFF timing normal? YES >> GO TO 6 NO >> GO TO 2 K 6.PERFORM THE DIAGNOSIS BY SYMPTOM Perform the diagnosis applicable to the symptom. >> GO TO 7 7. REPAIR OR REPLACE THE MALFUNCTIONING PARTS Repair or replace the specified malfunctioning parts. >> GO TO 8 N 8. FINAL CHECK Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, erase the self-diagnosis memory. Refer to BRC-78, "CONSULT-III Function (ABS)". Is no other DTC present and the repair completed? YES >> INSPECTION END Р NO >> GO TO 3

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[ABLS/ABS]

Diagnostic Work Sheet

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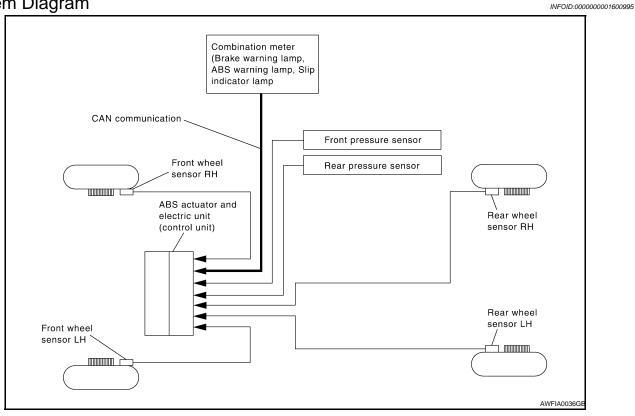
Customer name	Model & Year		VIN	
Engine #	Trans.		Mileage	
Incident Date	Manuf. Date		In Service Date	
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	ABS warning lamp activates		□ Pedal operation□ Large stroke pedal operation□ Firm pedal
	ABS does not work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

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FUNCTION DIAGNOSIS

ABLS

System Diagram



System Description

Active brake limited slip is a function to improve vehicle traction. Spinning of the drive wheels is detected by
the ABS actuator and electric unit (control unit) using inputs from the wheel speed sensors. If wheel spin
occurs, the ABLS system brakes the spinning wheel which distributes the driving power to the other drive
wheel.

During ABLS operation, it informs driver of system operation by flashing SLIP indicator lamp.

Electrical system diagnosis by CONSULT-III is available.

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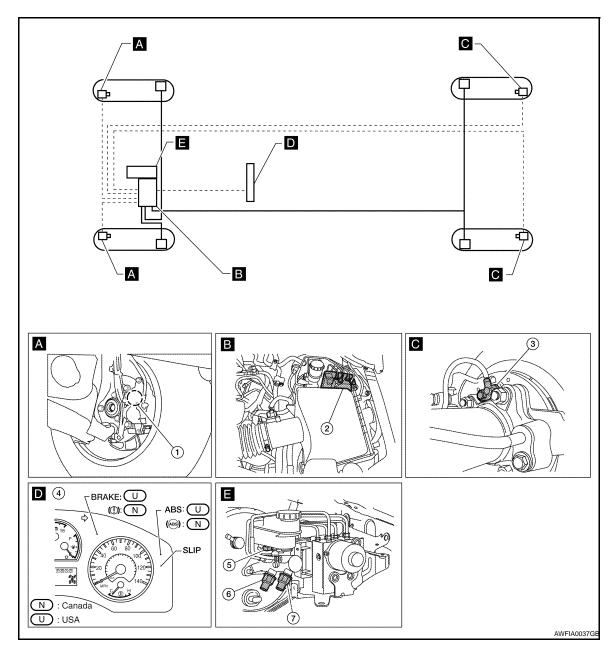
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Component Parts Location

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- 1. Front wheel sensor LH E18 RH E117
- 4. Combination meter M24, M25
- 7. Rear pressure sensor E32
- ABS actuator and electric unit (control unit) E125
- 5. Brake fluid level switch E21
- Rear wheel sensor LH C11 RH C10
- 6. Front pressure sensor E31

[ABLS/ABS]

Component Description

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Component parts		Reference	_
ABS actuator and electric unit (control unit)	Pump	PPC 04 "Description"	В
	Motor	BRC-91, "Description"	
	Actuator relay	BRC-104, "Description"	_
	Solenoid valve	BRC-97, "Description"	
	Switch-over valve (CV1, CV2, SV1, SV2)	BRC-111, "Description"	D
Wheel sensor		BRC-82, "Description"	
ABS warning lamp		BRC-116, "Description"	_
Brake warning lamp		BRC-117, "Description"	Е
SLIP indicator lamp		BRC-118, "Description"	
Front pressure sensor		BRC-106, "Description"	BRC
Rear pressure sensor		BIXC-100, Description	BIC

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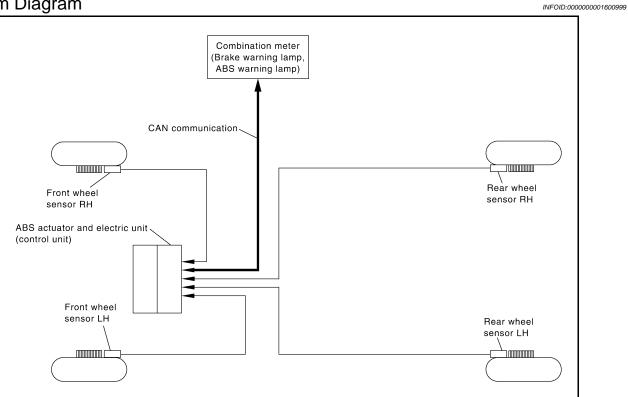
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ABS

System Diagram



System Description

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- Anti-Lock Braking System is a function that detects wheel revolution while braking, electronically controls
 braking force, and prevents wheel locking during sudden braking. It improves handling stability and maneuverability for avoiding obstacles.
- Electrical system diagnosis by CONSULT-III is available.

Component Parts Location

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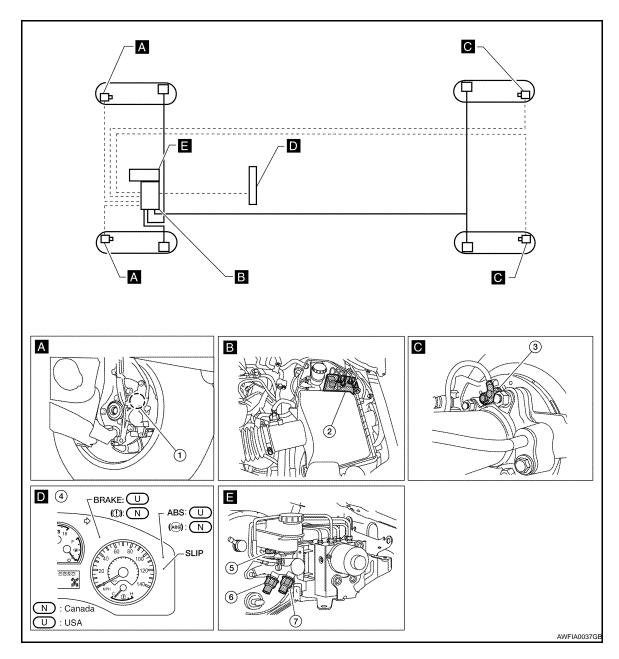
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- 1. Front wheel sensor LH E18 RH E117
- 4. Combination meter M24, M25
- 7. Rear pressure sensor E32
- ABS actuator and electric unit (control unit) E125
- . Brake fluid level switch E21
- Rear wheel sensor LH C11 RH C10
- 6. Front pressure sensor E31

Component Description

INFOID:0000000001601002

Compo	Reference	
ABS actuator and electric unit (control unit)	Pump	BRC-91, "Description"
	Motor	BKC-91, Description
	Actuator relay	BRC-104, "Description"
	Solenoid valve	BRC-97, "Description"

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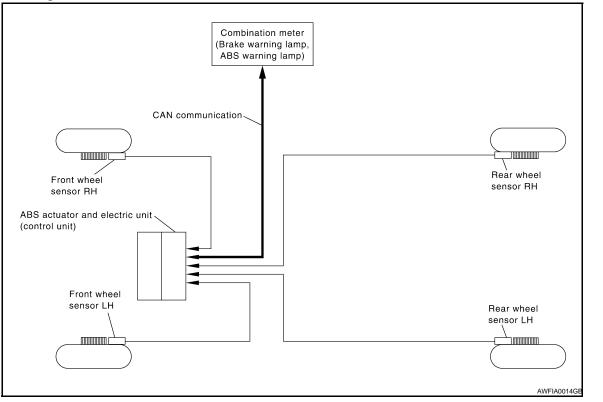
< FUNCTION DIAGNOSIS >

[ABLS/ABS]

Component parts	Reference
Wheel sensor	BRC-82, "Description"
ABS warning lamp	BRC-116, "Description"
Brake warning lamp	BRC-117, "Description"

EBD

System Diagram



System Description

INFOID:0000000001601004

• Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then it electronically controls the rear braking force (brake fluid pressure) to reduce rear wheel slippage. Accordingly, it improves vehicle stability.

• Electrical system diagnosis by CONSULT-III is available.

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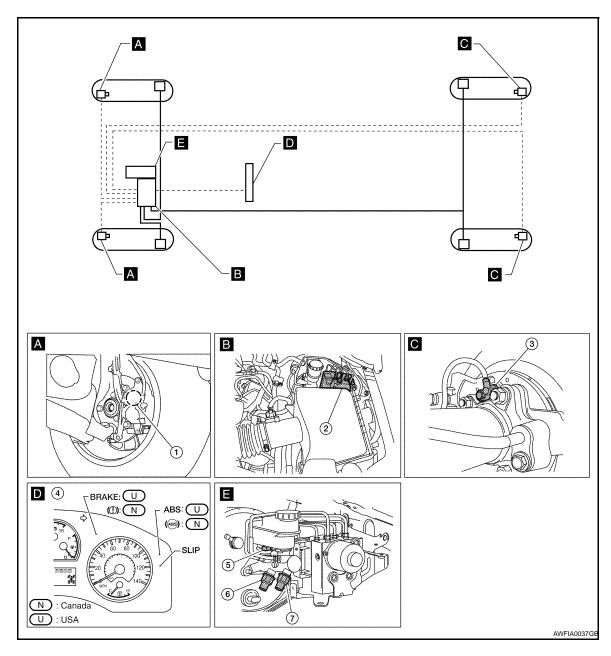
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Component Parts Location

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- 1. Front wheel sensor LH E18 RH E117
- 4. Combination meter M24, M25
- 7. Rear pressure sensor E32
- ABS actuator and electric unit (control unit) E125
- 5. Brake fluid level switch E21
- . Rear wheel sensor LH C11 RH C10
- 6. Front pressure sensor E31

Component Description

INFOID:0000000001677598

Compo	Reference	
ABS actuator and electric unit (control unit)	Pump	BRC-91, "Description"
	Motor	BRC-91, Description
	Actuator relay	BRC-104, "Description"
	Solenoid valve	BRC-97, "Description"

EBD

< FUNCTION DIAGNOSIS >

[ABLS/ABS]

Component parts	Reference
Wheel sensor	BRC-82, "Description"
ABS warning lamp	BRC-116, "Description"
Brake warning lamp	BRC-117, "Description"

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< FUNCTION DIAGNOSIS >

[ABLS/ABS]

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

CONSULT-III Function (ABS)

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FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.
Self-diagnostic results	Self-diagnostic results 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 is which CONSULT-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.
ECU part number	ABS actuator and electric unit (control unit) part number can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.

SELF-DIAG RESULTS MODE

Operation Procedure

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

How to Erase Self-diagnosis Results

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

CAUTION:

If memory cannot be erased, perform applicable diagnosis. NOTE:

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

Display Item List

Refer to BRC-130, "DTC No. Index".

DATA MONITOR MODE

Display Item List

Item	Data	monitor item sele			
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks	
GEAR	×	×	×	Gear position judged by PNP switch signal is displayed.	
FR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.	
FR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.	
RR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.	
RR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.	

< FUNCTION DIAGNOSIS >

[ABLS/ABS]

Item		a monitor item sele		Domestic	
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks	
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.	
N POSI SIG	-	-	×	Shift position judged by PNP switch signal.	
P POSI SIG	-	-	×	Shift position judged by PNP switch signal.	
ACCEL POS SIG (%)	×	-	×	Throttle valve open/close status judged by CAN communication signal is displayed.	
ENGINE SPEED (rpm)	×	×	×	Engine speed judged by CAN communication signal is displayed.	
DECEL G-SEN (d/s)	×	×	×	Longitudinal acceleration detected by decel G-sensor is displayed.	
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.	
ABS WARN LAMP (ON/OFF)	_	×	×	ABS warning lamp (ON/OFF) status is displayed.	
SLIP LAMP (ON/OFF)	_	×	×	SLIP indicator lamp (ON/OFF) status is displayed.	
FR LH IN SOL (ON/OFF)	_	×	×	Front LH IN ABS solenoid (ON/ OFF) status is displayed.	
FR LH OUT SOL (ON/OFF)	_	×	×	Front LH OUT ABS solenoid (ON/ OFF) status is displayed.	
RR RH IN SOL (ON/OFF)	_	×	×	Rear RH IN ABS solenoid (ON/ OFF) status is displayed.	
RR RH OUT SOL (ON/OFF)	_	×	×	Rear RH OUT ABS solenoid (ON/ OFF) status is displayed.	
FR RH IN SOL (ON/OFF)	-	×	×	Front RH IN ABS solenoid (ON/ OFF) status is displayed.	
FR RH OUT SOL (ON/OFF)	-	×	×	Front RH OUT ABS solenoid (ON/ OFF) status is displayed.	
RR LH IN SOL (ON/OFF)	_	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.	
RR LH OUT SOL (ON/OFF)	_	×	×	Rear LH OUT ABS solenoid (ON/ OFF) status is displayed.	
MOTOR RELAY (ON/OFF)	-	×	×	ABS motor relay signal (ON/OFF) status is displayed.	
ACTUATOR RLY (ON/OFF)	-	×	×	ABS actuator relay signal (ON/OFF) status is displayed.	
CV1 (ON/OFF)	-	-	×	Front side switch-over solenoid valve (cut valve) (ON/OFF) status is displayed.	
CV2 (ON/OFF)	-	-	×	Rear side switch-over solenoid valve (cut-valve) (ON/OFF) status is displayed.	
SV1 (ON/OFF)	-	-	×	Front side switch-over solenoid valve (suction valve) (ON/OFF) status is displayed.	
SV2 (ON/OFF)	-	-	×	Rear side switch-over solenoid valve (suction valve) (ON/OFF) status is displayed.	

< FUNCTION DIAGNOSIS >

[ABLS/ABS]

14	Data	a monitor item sele	ection	
Item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
TCS FAIL SIG (ON/OFF)	-	-	×	ABLS fail signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	-	-	×	ABS fail signal (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	-	-	×	EBD fail signal (ON/OFF) status is displayed.
FLUID LEV SW (ON/OFF)	×	-	×	Brake fluid level switch (ON/OFF) status is displayed.
EBD SIGNAL (ON/OFF)	-	-	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	-	-	×	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	-	-	×	ABLS operation (ON/OFF) status is displayed.
EBD WARN LAMP	-	-	×	Brake warning lamp (ON/OFF) status is displayed.
SLCT LVR POSI	×	×	×	Shift position judged by PNP switch signal.
R POSI SIG	-	-	×	Shift position judged by PNP switch signal.
2WD/4WD	-	-	×	It recognizes on software whether it is 2WD and whether it is in 4WD state.
PRESS SENSOR	×	-	×	Brake pressure detected by pressure sensor is displayed.
CRANKING SIG	-	-	×	The input state of the key SW START position signal is displayed.
PRESS SEN 2	-	-	×	Brake pressure detected by pressure sensor is displayed.

^{×:} Applicable

ACTIVE TEST

CAUTION:

- Do not perform active test while driving.
- Make sure to completely bleed air from the brake system.
- The ABS and brake warning lamps turn on during the active test.

Solenoid Valve Operation Chart

Operation		ABS solenoid valve			ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{-:} Not applicable

< FUNCTION DIAGNOSIS >

[ABLS/ABS]

Operation		ABS solenoid valve			ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
REAR SUL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

NOTE:

- If active test is performed with brake pedal depressed, pedal stroke may change. This is normal.
- "TEST IS STOPPED" is displayed approximately 10 seconds after operation starts.
- After "TEST IS STOPPED" is displayed, to perform test again, repeat Step 6.

ABS Motor

Touch "ON" and "OFF" on the screen. Check that ABS motor relay operates as shown in table below.

Operation	ON	OFF
ABS actuator relay	ON	ON
ABS motor relay	ON	OFF

NOTE:

- If active test is performed with brake pedal depressed, pedal stroke may change. This is normal.
- "TEST IS STOPPED" is displayed approximately 10 seconds after operation starts.

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COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description INFOID:000000001601008

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	Harness or connectorWheel sensor
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-1
RR LH SENSOR-1
FR RH SENSOR-1
FR LH SENSOR-1

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-82, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001601010

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector E125 and wheel sensor of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to BRC-142, "Removal and Installation".

3. CHECK TIRES

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

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

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

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and Service" (front) or <u>RAX-5</u>, "On-Vehicle Inspection" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-6</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

Wheel sensor connector Wriao343E

6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) harness connector E125 and the malfunctioning wheel sensor harness connector E18, E117, C10, or C11.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	•
Front LH		45	E18	1	
FIOIL LA	E125	46		2	Yes
Front RH		34	E117	1	
		33		2	
Rear LH		37	C11	2	
		36		1	
Rear RH		42	C10	2	
		43		1	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-144, "Removal and Installation".</u>

NO >> Repair the circuit.

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C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[ABLS/ABS]

Component Inspection

INFOID:0000000001601011

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-82, "Diagnosis Procedure".

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INFOID:0000000001677599

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
C1106	RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	Harness or connectorWheel sensor
C1107	FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	ABS actuator and electric unit (control unit)
C1108	FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-2
RR LH SENSOR-2
FR RH SENSOR-2
FR LH SENSOR-2

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-85, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector E125 and wheel sensor of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

BRC-85

2.check wheel sensor output signal

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to <u>BRC-142</u>, "Removal and Installation".

3. CHECK TIRES

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

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

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

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and Service" (front) or <u>RAX-5</u>, "On-Vehicle Inspection" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-6</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

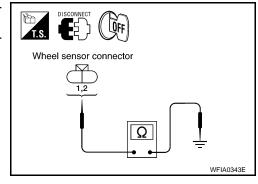
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) harness connector E125 and the malfunctioning wheel sensor harness connector E18, E117, C10, or C11.

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[ABLS/ABS]

INFOID:0000000001677600

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH		45	E18	1	Yes
FIUIIL LFI		46	⊏10	2	
Front RH	E125	34	E117	1	
		33		2	
Rear LH	E 123	37	C11	2	- 165
Real Ln		36		1	
Rear RH		42	C10	2	
		43		1	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-144, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-85, "Diagnosis Procedure".

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C1109 POWER AND GROUND SYSTEM

Description INFOID:000000001601018

Supplies electric power to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1109	BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-88, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001601020

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-78, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

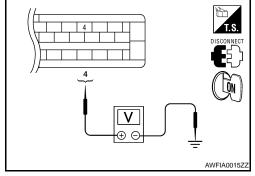
YES >> GO TO 2

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

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

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Turn ignition switch ON or OFF and check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

	or and elec- ontrol unit)	_	Condition	Voltage
Connector	Terminal	•		
F125	4	Ground	Ignition switch: ON	Battery voltage
L 123	4	Giodila	Ignition switch: OFF	Approx. 0V



4. Turn ignition switch OFF.

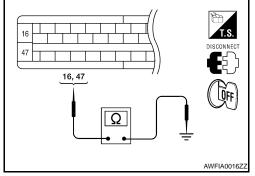
C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[ABLS/ABS]

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

	and electric unit ol unit)	— Continuit	
Connector	Terminal		
E125	16, 47	Ground	Yes



Is the inspection result normal?

- YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.
- NO >> Repair or replace malfunctioning components.

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C1110, C1113, C1160, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< COMPONENT DIAGNOSIS >

[ABLS/ABS]

C1110, C1113, C1160, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Logic (INFOID:000000001601022

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	
C1113	G-SENSOR	G-sensor is malfunctioning.	ABS actuator and electric unit (control unit)
C1160	DECEL G SEN SET	G-sensor is malfunctioning.	(control unit)
C1170	VARIANT CODING	In a case where VARIANT CODING is different.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE
G-SENSOR
DECEL G SEN SET
VARIANT CODING

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-90</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001601023

INSPECTION PROCEDURE

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

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-144, "Removal and Installation".

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[ABLS/ABS]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:000000001601025

PUMP

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The pump returns the brake fluid stored in the reservoir to the master cylinder by reducing the pressure.

MOTOR

The motor drives the pump according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1111	PUMP MOTOR	During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open.	Harness or connector ABS actuator and electric unit
OIIII	TOWN WOTON	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	(control unit)

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DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-91, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001601027

INSPECTION PROCEDURE

1. CHECK CONNECTOR

Turn ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-78, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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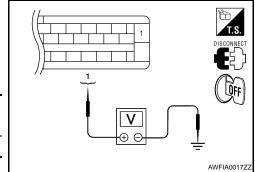
C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[ABLS/ABS]

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal	_		
E125	1	Ground	Battery voltage	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

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

ABS actuator and ele	ectric unit (control unit)	— Continuity		
Connector	Terminal	_	Continuity	
E125	16, 47	Ground	Yes	

16, 47

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-144, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000001601028

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1. CHECK ACTIVE TEST

- 1. On "ACTIVE TEST", select "ABS MOTOR".
- 2. Touch ON and OFF on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-91, "Diagnosis Procedure".

C1115 WHEEL SENSOR

Description

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	Harness or connector Wheel sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ABS SENSOR [ABNORMAL SIGNAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-93. "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001677601

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector E125 and wheel sensor of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

NOTE:

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

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

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to <u>BRC-142</u>, "Removal and Installation".

3.CHECK TIRES

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< COMPONENT DIAGNOSIS >

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

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

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

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "<u>On-Vehicle Inspection and Service</u>" (front) or <u>RAX-5</u>, "<u>On-Vehicle Inspection</u>" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-6</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

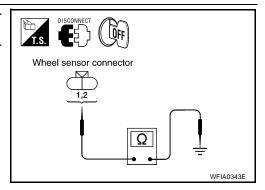
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- 2. Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) harness connector E125 and the malfunctioning wheel sensor harness connector E18, E117, C10, or C11.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity	
	Connector	Terminal	Connector	Terminal	-	
Front LH	- E125	45	E18	1	Yes	
FIOHL LM		46		2		
Front RH		34	E117	1		
I TOTAL IXIT		33		2		
Rear LH		37	C11	2		
iveal Li i		36		1		
Rear RH		42	C10	2		
INGALINII		43		1	_	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-144, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

INFOID:0000000001677602

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
--------------	------------------------------

	C1115 WHEEL SENSOR		
< COMPONENT DIAGNOSIS >		[ABLS/ABS]	
FR LH SENSOR		_	
FR RH SENSOR	Nearly matches the speedometer dis-	<i>A</i>	Α
RR LH SENSOR	play (±10% or less)		
RR RH SENSOR			В
Is the inspection result normal?			
YES >> INSPECTION END NO >> Go to diagnosis proce	dure. Refer to BRC-93, "Diagnosis Procedure".	(С
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C1116 STOP LAMP SWITCH

Description INFOID:000000001601040

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1116	STOP LAMP SW	When stop lamp switch circuit is open.	Harness or connector Stop lamp switch ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	_
STOP LAMP SW	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-96, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001601042

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- Disconnect the ABS actuator and electric unit (control unit) connector E125 and stop lamp switch connector E38.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

$2.\mathsf{stop}$ Lamp switch inspection

Check the voltage between the ABS actuator and electric unit (control unit) harness connector E125 terminal 41 and body ground.

Brake pedal depressed : Battery voltage

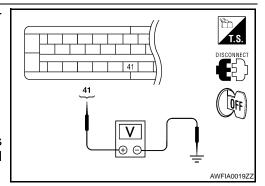
(approx. 12V)

Brake pedal not depressed : Approx. 0V

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-144, "Removal and Installation".

NO >> Refer to EXL-3, "Work Flow".



C1120, C1122, C1124, C1126 IN ABS SOL

Description INFOID:000000001601044

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1120	FR LH IN ABS SOL	When the control unit detects a malfunction in the front LH inlet solenoid circuit.	
C1122	2 FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	ABS actuator and electric unit
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH inlet solenoid circuit.	(control unit)
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH inlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH IN ABS SOL
FR RH IN ABS SOL
RR LH IN ABS SOL
RR RH IN ABS SOL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-97, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-78, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK SOLENOID, SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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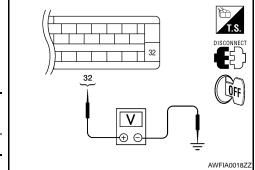
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1. Turn ignition switch OFF.

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

ABS actuator and ele	ectric unit (control unit)	— Voltage	
Connector	Terminal	— Vollage	voltage
E125	32	Ground	Battery voltage



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

${f 3.}$ check solenoid, switch-over valve and acuator relay ground circuit

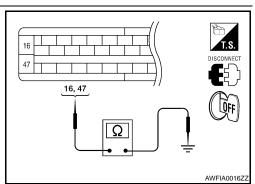
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

ABS actuator and ele	ectric unit (control unit)	Continuity	Continuity
Connector	Terminal	_	Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-144</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



INFOID:0000000001601047

[ABLS/ABS]

Component Inspection

1. CHECK ACTIVE TEST

- Select each test menu item on "ACTIVE TEST".
- On the display, touch "UP", "KEEP", and "DOWN", and check that the system operates as shown in the table below.

		AE	SS solenoid va	alve	ABS	solenoid valv	e (ACT)
Operation		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
NEAN OOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

Is the inspection result normal?

YES >> INSPECTION END

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[ABLS/ABS]

NO >> Go to diagnosis procedure. Refer to <u>BRC-97</u>. "<u>Diagnosis Procedure</u>".

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C1121, C1123, C1125, C1127 OUT ABS SOL

Description INFOID:000000001601049

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1121	FR LH OUT ABS SOL	When the control unit detects a malfunction in the front LH outlet solenoid circuit.	
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	ABS actuator and electric unit
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	(control unit)
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH OUT ABS SOL
FR RH OUT ABS SOL
RR LH OUT ABS SOL
RR RH OUT ABS SOL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-100, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001677603

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-78</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK SOLENOID, SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

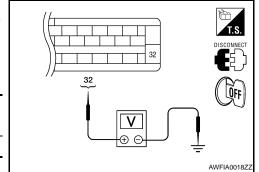
C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[ABLS/ABS]

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

ABS actuator and ele	ectric unit (control unit)	— Voltage	
Connector	Terminal	— Vollage	voltage
E125	32	Ground	Battery voltage



Is the inspection result normal?

>> GO TO 3 YES

NO >> Repair or replace malfunctioning components.

3.check solenoid, switch-over valve and acuator relay ground circuit

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

ABS actuator and ele	ectric unit (control unit)	— Continuity	
Connector	Terminal	_	Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-144, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

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INFOID:0000000001677604

Component Inspection

1. CHECK ACTIVE TEST

Select each test menu item on "ACTIVE TEST".

On the display, touch "UP", "KEEP", and "DOWN", and check that the system operates as shown in the table below.

		AE	S solenoid va	alve	ABS	solenoid valv	e (ACT)
Operation		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL RR LH ABS SOLE- NOID (ACT)	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
DEAD COL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
REAR SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

Is the inspection result normal?

>> INSPECTION END YES

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NO >> Go to diagnosis procedure. Refer to BRC-100, "Diagnosis Procedure".

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C1130, C1131, C1136 ENGINE SIGNAL

Description INFOID:0000000001601054

ABS actuator and electric unit (control unit) and ECM exchange the engine signal with CAN communication line.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1		Harness or connector
C1131	ENGINE SIGNAL 2	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine fuel cut system is	ABS actuator and electric unit (control unit)
C1136	ENGINE SIGNAL 6	malfunctioning.	ECM CAN communication line

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 6

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-103, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001601056

INSPECTION PROCEDURE

1. CHECK ENGINE SYSTEM

- 1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to EC-67, "CONSULT-III Function (ENGINE)".
- Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-78</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace the affected part.

NO >> INSPECTION END

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C1140 ACTUATOR RLY

Description INFOID:000000001601058

Activates or deactivates each solenoid valve according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	ABS actuator relay or circuit malfunction.	Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ACTUATOR RLY

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-104, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001677605

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-78, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

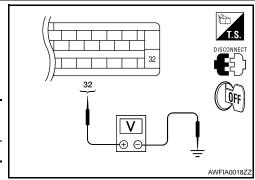
NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID, SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

Turn ignition switch OFF.

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

ABS actuator and electric unit (control unit)		_	Voltage
Connector	Terminal		voltage
E125	32	Ground	Battery voltage



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3. CHECK SOLENOID, SWITCH-OVER VALVE AND ACUATOR RELAY GROUND CIRCUIT

C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

[ABLS/ABS]

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

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

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Is the inspection result normal?

>> Replace ABS actuator and electric unit (control unit). YES Refer to BRC-144, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000001677606

1. CHECK ACTIVE TEST

- Select each test menu item on "ACTIVE TEST".
- On the display, touch "UP", "KEEP", and "DOWN", and check that the system operates as shown in the table below.

Operation		AE	SS solenoid va	alve	ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
ILLANC GOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-104</u>, "<u>Diagnosis Procedure</u>". **BRC**

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C1142 PRESS SENSOR

Description INFOID:000000001601063

The front and rear pressure sensors convert the brake fluid pressure to an electric signal and transmit it to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1142	PRESS SEN CIRCUIT	Pressure sensor signal line is open or shorted, or pressure sensor is malfunctioning.	Harness or connector Pressure sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
PRESS SEN CIRCUIT	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-106, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001601065

FRONT PRESSURE SENSOR INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- 1. Turn the ignition switch OFF.
- 2. Disconnect the front pressure sensor connector E31 and ABS actuator and electric unit (control unit) connector E125 and inspect the terminals for deformation, disconnection, looseness, or damage.

Is the inspection result normal?

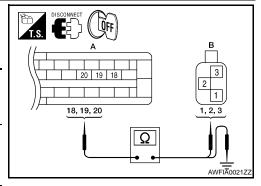
YES >> GO TO 2

NO >> Repair connector.

2.FRONT PRESSURE SENSOR CIRCUIT INSPECTION

 Measure the continuity between the ABS actuator and electric unit (control unit) harness connector E125 (A) and front pressure sensor harness connector E31 (B).

	and electric unit	Front pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
-	18		3	
A: E125	19	B: E31	1	Yes
	20		2	



Measure the continuity between the ABS actuator and electric unit (control unit) harness connector E125

 (A) and body ground.

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
	18		
A: E125	19	Ground	No
	20		

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

3. FRONT PRESSURE SENSOR INSPECTION

- Reconnect the front pressure sensor and ABS actuator and electric unit (control unit) connectors.
- 2. Use "DATA MONITOR" to check if the status of "PRESS SENSOR" is normal.

Condition	PRESS SENSOR (DATA MONITOR)
With ignition switch turned ON and brake pedal released.	Approx. 0 bar
With ignition switch turned ON and brake pedal depressed.	Positive value

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the front pressure sensor.

REAR PRESSURE SENSOR INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- 1. Turn the ignition switch OFF.
- 2. Disconnect the rear pressure sensor connector E32 and ABS actuator and electric unit (control unit) connector E125 and inspect the terminals for deformation, disconnection, looseness, or damage.

Is the inspection result normal?

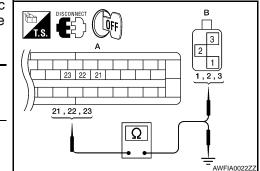
YES >> GO TO 2

NO >> Repair connector.

2. REAR PRESSURE SENSOR CIRCUIT INSPECTION

 Measure the continuity between the ABS actuator and electric unit (control unit) harness connector E125 (A) and rear pressure sensor harness connector E32 (B).

	and electric unit ol unit)	Rear pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
	21		1	
A: E125	22	B: E32	3	Yes
	23		2	



2. Measure the continuity between the ABS actuator and electric unit (control unit) harness connector E125 (A) and body ground.

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
	21		
A: E125	22	Ground	No
	23		

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< COMPONENT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

3. REAR PRESSURE SENSOR INSPECTION

- 1. Reconnect the rear pressure sensor and ABS actuator and electric unit (control unit) connectors.
- 2. Use "DATA MONITOR" to check if the status of "PRESS SEN2" is normal.

Condition	PRESS SEN2 (DATA MONITOR)
With ignition switch turned ON and brake pedal released.	Approx. 0 bar
With ignition switch turned ON and brake pedal depressed.	Positive value

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the rear pressure sensor.

Component Inspection

INFOID:0000000001601066

1. CHECK DATA MONITOR

On "DATA MONITOR", select "PRESS SENSOR" and "PRESS SEN2" and check the brake fluid pressure.

Condition	PRESS SENSOR and PRESS SEN2 (DATA MONITOR)
With ignition switch turned ON and brake pedal released.	Approx. 0 bar
With ignition switch turned ON and brake pedal depressed.	Positive value

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-106, "Diagnosis Procedure".

[ABLS/ABS]

C1155 BRAKE FLUID LEVEL SWITCH

Description

The brake fluid level switch converts the brake fluid level to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1155	BR FLUID LEVEL LOW	Brake fluid level is low or communication line between the ABS actuator and electric unit (control unit) and brake fluid level switch is open or shorted.	Harness or connector Brake fluid level switch Brake fluid level

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BR FLUID LEVEL LOW

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-109, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- Disconnect ABS actuator and electric unit (control unit) connector E125 and brake fluid level switch connector E21.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK HARNESS BETWEEN BRAKE FLUID LEVEL SWITCH AND ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

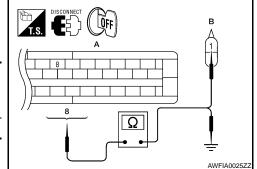
 Check continuity between ABS actuator and electric unit (control unit) harness connector E125 (A) and brake fluid level switch harness connector E21 (B).

	and electric unit ol unit)	Brake fluid	Continuity	
Connector	Terminal	Connector		
A: E125	8	B: E21	1	Yes

Check continuity between ABS actuator and electric unit (control unit) harness connector E125 (A) and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal			
A: E125	8	Ground	No	

Is the inspection result normal?



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INFOID:0000000001601075

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< COMPONENT DIAGNOSIS >

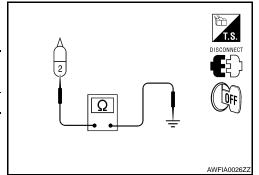
YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.check brake fluid level switch ground

Check continuity between brake fluid level switch harness connector E21 and ground.

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



Is the inspection result normal?

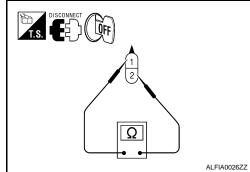
YES >> GO TO 4

NO >> Repair or replace malfunctioning components.

4. CHECK BRAKE FLUID LEVEL SWITCH

Check continuity between brake fluid level switch terminals.

Brake fluid level switch	Condition	Continuity	
Terminal	Condition		
1-2	When brake fluid is full in the reservoir tank.	No	
1 – 2	When brake fluid is empty in the reservoir tank.	Yes	



Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results _____

appear, replace ABS actuator and electric unit (control unit). Refer to <u>BRC-144</u>, "Removal and <u>Installation"</u>.

NO >> Replace brake fluid level switch.

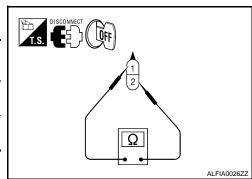
Component Inspection

INFOID:0000000001601076

1. CHECK BRAKE FLUID LEVEL SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect brake fluid level switch connector.
- 3. Check continuity between brake fluid level switch terminals.

Brake fluid level switch	Condition	Continuity	
Terminal	Condition		
1 – 2	When brake fluid is full in the reservoir tank.	No	
1 – 2	When brake fluid is empty in the reservoir tank.	Yes	



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake fluid level switch.

[ABLS/ABS]

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INFOID:0000000001677607

C1164, C1165, C1166, C1167 CV/SV SYSTEM

Description INFOID:000000001601087

CV1, CV2 (CUT VALVE)

The cut valve shuts off the normal brake fluid path from the master cylinder, when ABLS is activated.

SV1, SV2 (SUCTION VALVE)

The suction valve supplies the brake fluid from the master cylinder to the pump, when ABLS is activated.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1164	CV1	Switch-over solenoid valve (CV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	
C1165	CV2	Switch-over solenoid valve (CV2) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	Harness or connector ABS actuator and electric unit
C1166	SV1	Switch-over solenoid valve (SV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	(control unit)
C1167	SV2	Switch-over solenoid valve (SV2) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CV1
CV2
SV1
SV2

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-111</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-78</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

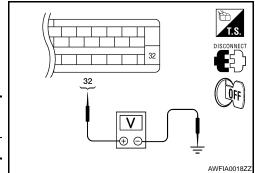
NO >> Poor connection of connector terminal. Repair or replace connector.

BRC-111

2.check solenoid, switch-over valve and actuator relay power supply circuit

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal	_	voltage	
E125	32	Ground	Battery voltage	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

${f 3.}$ CHECK SOLENOID, SWITCH-OVER VALVE AND ACUATOR RELAY GROUND CIRCUIT

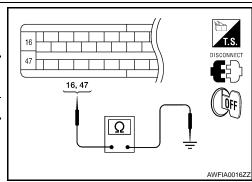
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

ABS actuator and ele	ectric unit (control unit)	_	Continuity	
Connector	Terminal		Continuity	
E125	16, 47	Ground	Yes	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-144</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



INFOID:0000000001677608

Component Inspection

1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- 2. On the display, touch "UP", "KEEP", and "DOWN", and check that the system operates as shown in the table below.

		AE	3S solenoid va	alve	ABS	ABS solenoid valve (ACT)		
Operation		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP	
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF	
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF	
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF	
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF	
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF	
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF	
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF	
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF	
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF	
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF	
NEAN SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF	
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF	

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

C1164, C1165, C1166, C1167 CV/SV SYSTEM [ABLS/ABS] < COMPONENT DIAGNOSIS > Is the inspection result normal? Α YES >> INSPECTION END >> Go to diagnosis procedure. Refer to BRC-111, "Diagnosis Procedure". NO В С D Е BRC G Н J Κ L M Ν 0

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[ABLS/ABS]

C1187 DIFFERENTIAL LOCK CONTROL UNIT

Description INFOID:000000001677609

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1187	ABS DIFLOCK CONTROL- LER NG	Differential lock controller malfunction.	Harness or connector CAN communication line Differential lock control unit ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
ABS DIFLOCK CONTROLLER NG	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-114, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001677611

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E125, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 2. Reconnect connector and perform self-diagnosis.

Self-diagnosis results	
ABS DIFLOCK CONTROLLER NG	

Is above displayed on the self-diagnosis display?

YES >> Refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> INSPECTION END

[ABLS/ABS]

U1000 CAN COMM CIRCUIT

Description INFOID:000000001601102

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	

Diagnosis Procedure

INFOID:0000000001601104

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.

Reconnect connector and perform self-diagnosis.

Is "CAN COMM CIRCUIT" displayed in self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> Connector terminal is loose, damaged, open, or shorted.

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ABS WARNING LAMP

Description INFOID:000000001601110

 \times : ON -: OFF

Condition	ABS warning lamp
Ignition switch OFF	-
For 1 second after turning ON ignition switch	×
1 second later after turning ON ignition switch	-
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000001601111

1. CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-116, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000001601112

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-78</u>, "CONSULT-III Function (ABS)".

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-26, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-144, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-72, "Removal and Installation".

[ABLS/ABS]

BRAKE WARNING LAMP

Description INFOID:000000001601113

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Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
For 1 second after turning ON ignition switch	× (Note 2)
1 second later after turning ON ignition switch	× (Note 2)
EBD function is malfunctioning.	×

NOTE:

- 1: Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- · 2: After starting engine, brake warning lamp is turned off.

1.BRAKE WARNING LAMP OPERATION CHECK

Component Function Check

INFOID:0000000001601114

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Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-117</u>, "<u>Diagnosis Procedure</u>".

Diagnosis Procedure

INFOID:0000000001601115

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis.

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-26, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-144, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-72, "Removal and Installation".

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SLIP INDICATOR LAMP

Description INFOID:000000001601119

 \times : ON -: OFF

Condition	SLIP indicator lamp
Ignition switch OFF	-
For 1 second after turning ON ignition switch	×
1 second later after turning ON ignition switch	-
ABLS function is active.	×

Component Function Check

INFOID:0000000001601120

1. CHECK SLIP INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-118, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000001601121

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-78, "CONSULT-III Function (ABS)".

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-26, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-144, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-72, "Removal and Installation".

[ABLS/ABS] < ECU DIAGNOSIS >

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ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value INFOID:0000000001601122

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

	MONITOR	

	R ITEM	D. (
NA - mite or it or or	5	Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
		0 [km/h (MPH)]	Vehicle stopped	
FR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
FR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
RR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
STOP LAMP SW	Ston Jamp quitab gignal status	When brake pedal is depressed	ON	
STOP LAWIP SW	Stop lamp switch signal status	When brake pedal is released	OFF	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5	
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D	
ACCEL POS SIG	Throttle actuator opening/closing is dis-	Accelerator pedal not depressed (ignition switch is ON)	0 %	
ACCEL POS SIG	played (linked with accelerator pedal)	Accelerator pedal depressed (ignition switch is ON)	0 - 100 %	
PRESS SENSOR	Brake fluid pressure detected by front pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar	
FINESS SENSOR		With ignition switch turned ON and brake pedal depressed	-40 to 300 bar	
		With engine stopped	0 rpm	
ENGINE SPEED	With engine running	Engine running	Almost in accordance with tachometer display	
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch ON	ON	
I LUID LEV SVV	Brake fluid level switch signal status	When brake fluid level switch OFF	OFF	

BRC-119

< ECU DIAGNOSIS > [ABLS/ABS]

< ECO DIAGNO:	510 >		[ABEGIABO]		
		Data monitor			
Monitor item	Display content	Condition	Reference value in normal operation		
FR RH IN SOL		Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON		
TRATIN OOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF		
FR RH OUT SOL	Operation status of each calencid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON		
FR RH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF		
FR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON		
TIX EITIN SOL	Operation status of each soleliold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF		
ED I H OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON		
FR LH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF		
RR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON		
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF		
DD DH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON		
RR RH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF		
	Operation status of each calencid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON		
RR LH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF		
RR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON		
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF		
		When the motor relay and motor are operating	ON		
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are not operating	OFF		
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	ON		
		When the actuator relay is not operating	OFF		

< ECU DIAGNOSIS > [ABLS/ABS]

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
ABS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	ON	
ADS WARN LAWP	(Note 2)	When ABS warning lamp is OFF	OFF	
SLIP LAMP	SLIP indicator lamp	When SLIP indicator lamp is ON	ON	
SLIP LAWIP	(Note 2)	When SLIP indicator lamp is OFF	OFF	
EDD SIGNAL	EPD energian	EBD is active	ON	
EBD SIGNAL	EBD operation	EBD is inactive	OFF	
ADC CICNIAL	ADOti	ABS is active	ON	
ABS SIGNAL	ABS operation	ABS is inactive	OFF	
TOO CLONIAL	ADI Commention	ABLS is active	ON	
TCS SIGNAL	ABLS operation	ABLS is inactive	OFF	
		In EBD fail-safe	ON	
EBD FAIL SIG	EBD fail-safe signal	EBD is normal	OFF	
ADO EAU 010	ADO (citary)	In ABS fail-safe	ON	
ABS FAIL SIG	ABS fail-safe signal	ABS is normal	OFF	
		In ABLS fail-safe	ON	
TCS FAIL SIG	ABLS fail-safe signal	ABLS is normal	OFF	
		Crank is active	ON	
CRANKING SIG	Crank operation	Crank is inactive	OFF	
CV1	Switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON	
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF	
CV2	Switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON	
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF	
SV1	Switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON	
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF	
SV2	Switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON	
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF	
DECEL C CEN	Longitudinal acceleration detected by Decel	Vehicle stopped	Approx. 0 G	
DECEL G-SEN G-Sensor		Vehicle running	-1.7 to 1.7 G	

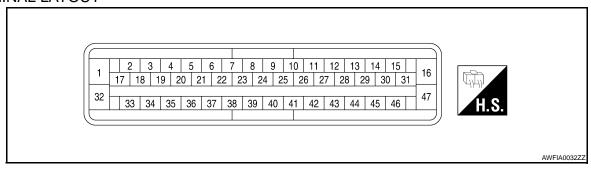
< ECU DIAGNOSIS > [ABLS/ABS]

	Display content	Data monitor		
Monitor item		Condition	Reference value in normal operation	
EBD WARN LAMP	EBD warning lamp	When EBD warning lamp is ON	ON	
EDD WARN LAWP	(Note 2)	When EBD warning lamp is OFF	OFF	
N DOCL CIC	DND quitab size of ON/OFF condition	A/T shift position = N position	ON	
N POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = other than N position	OFF	
P POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = P position	ON	
		A/T shift position = other than P position	OFF	
D D001 010	PNP switch signal ON/OFF condition	A/T shift position = R position	ON	
R POSI SIG		A/T shift position = other than R position	OFF	
2WD/4WD	Drive axle	2WD model	2WD	
		4WD model	4WD	
PRESS SEN2	Brake fluid pressure detected by rear pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar	
		With ignition switch turned ON and brake pedal depressed	-40 to 300 bar	

NOTE:

- 1: Confirm tire pressure is normal.
- 2: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-116, "Description".
- Brake warning lamp: Refer to BRC-117, "Description".
- SLIP indicator lamp: Refer to BRC-118, "Description".

TERMINAL LAYOUT

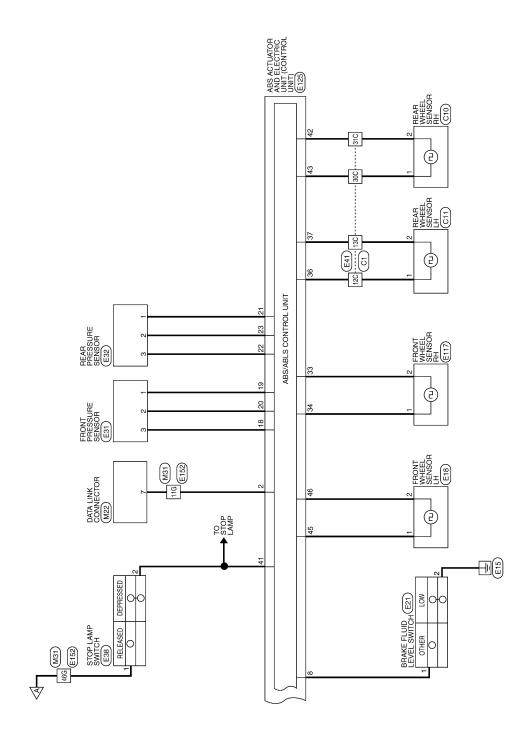


[ABLS/ABS] < ECU DIAGNOSIS > Wiring Diagram INFOID:0000000001601123 Α ■ : DATA LINE В C IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODLE ENGINE ROOM) (E119) D 10A Е BRC COMBINATION METER (M24), (M25) _@ #≅ Susv₁ G AHSV2 AHSV1 AUSV2 (MC2) UNIFIED METER CONTROL UNIT (WITH INFORMATION DISPLAY) Seut Sir Н ABS/ABLS CONTROL UNIT TA ABS T SLIP BRAKE FUSE BLOCK (J/B) (M4), (M39), (M60) ger gr J IGNITION SWITCH ON OR START M31 816 E152 10A Κ **BRAKE CONTROL SYSTEM - ABLS** 10A L M 30A H MoToN Roffe 40 4 Ν BATTERY

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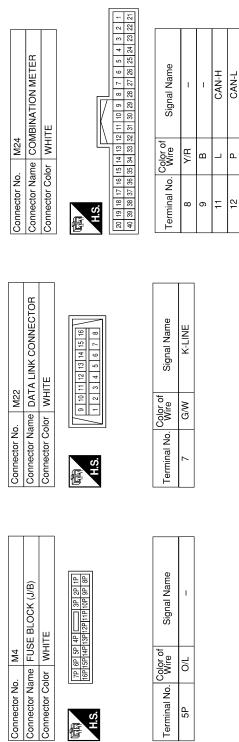
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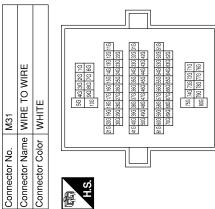
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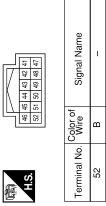
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BRAKE CONTROL SYSTEM - ABLS CONNECTORS



Signal Name	I	1	-	_
Color of Wire	G/W	_	Ь	R/Y
Terminal No. Wire	11G	31G	42G	46G





Connector Name | COMBINATION METER

M25

Connector No.

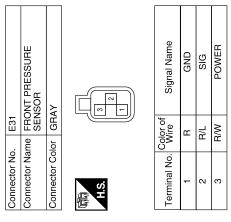
Connector Color WHITE

AWFIA0053GB

BRC-125

E18	Connector Name FRONT WHEEL SENSOR LH Connector Color GRAY	[2]	of Signal Name –
	ame F		Color of Wire G/O BR/W
Connector No.	Connector Name FRON- Connector Color GRAY	斯斯 H.S.	Terminal No. Color of Wire 1 G/O 2 BR/W
	Connector Name FUSE BLOCK (J/B) Connector Color WHITE	57 47 31	Signal Name
M60	e FUS	2T 6T	olor of Wire R/Y
Connector No.	Connector Name FUSE B	原 H.S.	Color of Wire 11 R/Y
	E BLOCK (J/B) TE	20	Signal Name
M39	e FUS	8 8 1 1 2 1	olor of Wire Y/R
Connector No.	Connector Name FUSE BLOCK Connector Color WHITE	南南 H.S.	Color of Wire 4Q Y/R

					_	
	STOP LAMP SWITCH (FLOOR SHIFT)	CK		Signal Name	-	-
E38		or BLACK	[2	Color of Wire	R/Υ	R/B
Cormector No.	Connector Name	Connector Color	所 H.S.	Terminal No.	-	2



	BRAKE FLUID LEVEL SWITCH	AY	√ (- z)	Signal Name	ı	I
E21		olor GRAY		Color of Wire	P/B	В
Connector No.	Connector Name	Connector Color	是 H.S.	Terminal No.	-	2

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[ABLS/ABS] < ECU DIAGNOSIS >

	FRONT WHEEL SENSOR RH	47		Signal Name	-	1
E117	me FR(or GRAY		Color of Wire	B/R	BR
Connector No.	Connector Name	Connector Color	(南) H.S.	Terminal No. Wire	-	2

E41	WIRE TO WIRE	GRAY	10	35C 35C 34C 35C 36C 37C 36C 35C 41C 41C
Connector No.	Connector Name	Connector Color	H.S. 650	32C 48C

Connector Color GRAY	AY	10	Signal Nar	_	1	-	-
H.S. H.S. Terminal No. 12C 13C 30C 31C	\dashv	10 10 10 10 10 10 10 10 10 10 10 10 10 1	Color of Wire	_	۵	G/Y	۸
	Connector Co	任.S.		12C	13C	30C	31C

Connector No.	. E38	
Connector Name		STOP LAMP SWITCH (COLUMN SHIFT)
Connector Color	lor WHITE	ПЕ
H.S.		
Terminal No.	Color of Wire	Signal Name
-	R/Y	ı
2	B/B	1

E119	Connector Name IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	HITE	18 7 6 5 4 3 11 10	of Signal Name	ABS IGN SUPPLY	
Connector No. E-	Connector Name IF Pr	Connector Color WHITE	(18 17 H.S.	Terminal No. Wire	15 G/R	
					,	AWFIA0055G

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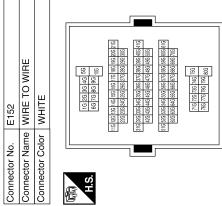
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Signal Name	ı	1	_	_	
Color of Wire	G/W	7	Ь	R/Y	
 Terminal No. Wire	11G	31G	42G	46G	

	REAR WHEEL SENSOR RH	BROWN	[]	Signal Name	1	
. C10	me RE/	_		Color of Wire	G/Y	>
Connector No.	Connector Name	Connector Color	H.S.	Terminal No.	-	c

Signal Name	CAN-H	CAN-L	VALVE_ECU_GND	PS1 - SUPPLY	PS1 - GND	PS1_SIGNAL	PS2_GND	PS2_SUPPLY	PS2_SIGNAL	VALVE_ECU_SUPPLY	WSS_FR_SIG	WSS_FR_PWR	WSS_RL_PWR	WSS_RL_SIG	BLS	WSS_FL_PWR	WSS_FL_SIG	MOTOR_GND
Color of Wire	_	Ь	В	B/W	В	R/L	R/B	M/L	O/M	В/У	BR	B/B	٦	Ь	R/B	G/O	BR/W	В
Terminal No.	Ξ	15	16	18	19	20	21	22	23	32	33	34	96	37	41	45	46	47

Signal Name	1	-	-	-
Color of Wire	7	Ь	G/Y	Λ
Terminal No.	12C	13C	30C	31C

Connector No.	E125
Connector Name	Connector Name ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color BLACK	BLACK



Signal Name	MOTOR_SUPPLY	DIAG_K	NÐI	FLUID_LEVEL_SW	
Color of Wire	٨	G/W	G/R	P/B	
Terminal No.	-	2	4	8	

Connector No. C1

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< ECU DIAGNOSIS > [ABLS/ABS]

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Fail-Safe

CAUTION:

If the Fail-Safe function is activated, perform the Self Diagnosis for ABS/ABLS system.

ABS/EBD SYSTEM

REAR WHEEL SENSOR LH

Connector Name Connector Color

C11

Connector No.

BROWN

Signal Name

Color of Wire

Terminal No.

▄

In case of an electrical malfunction with the ABS, the ABS warning lamp will turn on. In case of an electrical malfunction with the EBD system, the brake warning lamp and ABS warning lamp will turn on.

< ECU DIAGNOSIS > [ABLS/ABS]

The system will revert to one of the following conditions of the Fail-Safe function.

- 1. For ABS malfunction, only the EBD is operative and the condition of the vehicle is the same condition of vehicles without ABS/ABLS system.
- 2. For EBD malfunction, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without ABS/ABLS or EBD system.

ABLS SYSTEM

In case of an ABLS system malfunction, the ABS warning lamp will turn on and only the EBD is operative. The condition of the vehicle is the same as the condition of vehicles without ABS/ABLS system.

DTC No. Index

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	PDC 92 "Description"
C1103	FR RH SENSOR-1	BRC-82, "Description"
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	PDC 95 "Description"
C1107	FR RH SENSOR-2	BRC-85, "Description"
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-88, "Description"
C1110	CONTROLLER FAILURE	BRC-90, "DTC Logic"
C1111	PUMP MOTOR	BRC-91, "Description"
C1113	G-SENSOR	BRC-90, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-93, "Description"
C1116	STOP LAMP SW	BRC-96, "Description"
C1120	FR LH IN ABS SOL	BRC-97, "Description"
C1121	FR LH OUT ABS SOL	BRC-100, "Description"
C1122	FR RH IN ABS SOL	BRC-97, "Description"
C1123	FR RH OUT ABS SOL	BRC-100, "Description"
C1124	RR LH IN ABS SOL	BRC-97, "Description"
C1125	RR LH OUT ABS SOL	BRC-100, "Description"
C1126	RR RH IN ABS SOL	BRC-97, "Description"
C1127	RR RH OUT ABS SOL	BRC-100, "Description"
C1130	ENGINE SIGNAL 1	
C1131	ENGINE SIGNAL 2	BRC-103, "Description"
C1136	ENGINE SIGNAL 6	
C1140	ACTUATOR RLY	BRC-104, "Description"
C1142	PRESS SEN CIRCUIT	BRC-106, "Description"
C1155	BR FLUID LEVEL LOW	BRC-109, "Description"
C1160	DECEL G SEN SET	BRC-90, "DTC Logic"
C1164	CV1	
C1165	CV2	BRC-111, "Description"
C1166	SV1	BRO-111, Description
C1167	SV2	
C1170	VARIANT CODING	BRC-90, "DTC Logic"

< ECU DIAGNOSIS > [ABLS/ABS]

DTC	Items (CONSULT screen terms)	Reference
C1187	ABS DIFLOCK CONTROLLER NG	BRC-114, "Description"
U1000	CAN COMM CIRCUIT	BRC-115, "Description"

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SYMPTOM DIAGNOSIS

ABLS/ABS

Symptom Table

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

Symptom	Check item	Reference
- · · · · · · · · · · · · · · · · · · ·	Brake force distribution	DDQ 400 HD;
Excessive ABS function operation frequency	Looseness of front and rear axle	BRC-133, "Diag- nosis Procedure"
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-134, "Diag-
	Make sure the braking force is sufficient when the ABS is not operating.	nosis Procedure"
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-135, "Diag- nosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-136, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-137, "Diag-
occurs (Note 2)	ABS actuator and electric unit (control unit)	nosis Procedure"

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

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

[ABLS/ABS] < SYMPTOM DIAGNOSIS > **EXCESSIVE ABS FUNCTION OPERATION FREQUENCY** Α Diagnosis Procedure INFOID:0000000001601127 1.CHECK START В Check front and rear brake force distribution using a brake tester. Is the inspection result normal? YES >> GO TO 2 NO >> Check brake system. 2.CHECK FRONT AND REAR AXLE D Make sure that there is no excessive play in the front and rear axles. Refer to front: FAX-5, "On-Vehicle Inspection and Service", Rear: RAX-5, "On-Vehicle Inspection". Is the inspection result normal? Е YES >> GO TO 3 NO >> Repair or replace malfunctioning components. 3.CHECK WHEEL SENSOR AND SENSOR ROTOR **BRC** Check the following. Wheel sensor installation for damage. Sensor rotor installation for damage. Wheel sensor connector connection. · Wheel sensor harness inspection. Is the inspection result normal? Н YES >> GO TO 4 NO >> • Replace wheel sensor or sensor rotor. Refer to BRC-142, "Removal and Installation". Repair harness. 4. CHECK ABS WARNING LAMP DISPLAY Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving. Is the ABS warning lamp illuminated? YES >> Perform self-diagnosis. Refer to BRC-78, "CONSULT-III Function (ABS)". NO >> Normal K L M Ν Р

[ABLS/ABS]

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000001601128

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-14, "Inspection and Adjustment".

Is the stroke too large?

YES

- >> Bleed air from brake tube and hose. Refer to <u>BR-16</u>, "<u>Bleeding Brake System"</u>.
 - Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to <u>BR-14</u>, "<u>Inspection and Adjustment</u>" (brake pedal), <u>BR-11</u>, "<u>On Board Inspection</u>" (master cylinder), <u>BR-10</u>, "<u>Inspection</u>" (brake booster).

NO >> GO TO 2

2. CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

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

1.CHECK FUNCTION

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

YES >> Normal

NO >> Check brake system.

Is the inspection result normal?

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ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[ABLS/ABS]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000001601130

CAUTION:

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

1. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving. Is the inspection result normal?

YES >> Normal

NO >> Perform self-diagnosis. Refer to BRC-78, "CONSULT-III Function (ABS)".

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

[ABLS/ABS] < SYMPTOM DIAGNOSIS > PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS Α Diagnosis Procedure INFOID:0000000001601131 **CAUTION:** В Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal. When shifting gears When driving on slippery road During cornering at high speed When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more] When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher] D 1.SYMPTOM CHECK 1 Check that there are pedal vibrations when the engine is started. Е Do vibrations occur? YES >> GO TO 2 NO >> Inspect the brake pedal. BRC 2.SYMPTOM CHECK 2 Check that there are ABS operation noises when the engine is started. Do the operation noises occur? YES >> GO TO 3 NO >> Perform self -diagnosis. Refer to BRC-78, "CONSULT-III Function (ABS)". Н 3.SYMPTOM CHECK 3 Check symptoms when electrical component (headlamps, etc.) switches are operated. Do symptoms occur? YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away. NO >> Normal J K L M Ν Р

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[ABLS/ABS]

NORMAL OPERATING CONDITION

Description INFOID:000000001601133

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

< PRECAUTION > [ABLS/ABS]

PRECAUTION

PRECAUTIONS

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

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

WARNING:

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

Precaution for Brake System

CAUTION:

- Always use recommended brake fluid. Refer to MA-10, "Fluids and Lubricants".
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- If a brake fluid leak is found, the part must be disassembled without fail. Then it has to be replaced with a new one if a defect exists.
- Turn the ignition switch OFF and remove the connector of the ABS actuator and electric unit (control unit) or the battery terminal before performing the work.
- Always torque brake lines when installing.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

Refer to <u>BR-35</u>, "<u>Brake Burnishing Procedure</u>" (front disc brake) or <u>BR-40</u>, "<u>Removal and Installation of Brake Pad</u>" (rear disc brake).

WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precaution for Brake Control

- During ABS operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is normal.
- Just after starting vehicle, the brake pedal may vibrate or a motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

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Commercial service tool

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< PRECAUTION > [ABLS/ABS]

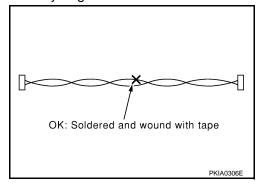
 When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnosis. Besides electrical system inspection, check booster operation, brake fluid level, and fluid leaks.

- If incorrect tire sizes or types are installed on the vehicle or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna or related wiring near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits or improper wiring.

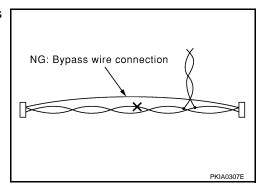
Precaution for CAN System

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- Do not apply voltage of 7.0V or higher to terminal to be measured.
- Maximum open terminal voltage of tester in use must be less than 7.0V.
- Before checking harnesses, turn ignition switch OFF and disconnect battery negative cable.
- Area to be repaired must be soldered and wrapped with tape.
 Make sure that fraying of twisted wire is within 110 mm (4.33 in).



 Do not make a bypass connection to repaired area. (If the circuit is bypassed, characteristics of twisted wire will be lost.)



PREPARATION

[ABLS/ABS] < PREPARATION >

PREPARATION

PREPARATION

Special Service Tool

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

Tool number (Kent-Moore No.) Tool name		Description	С
— (J-45741) ABS active wheel sensor tester	J-45741-BOX O C POWER SIMBUR	Checking operation of ABS active wheel sensors	D E BRC
ST30031000		Removing axle shaft bearing	
Bearing splitter			G
	ZZA0700D		Н

Commercial Service Tool

Tool name		Description
Flare nut crowfoot Torque wrench		Removing and installing brake piping a: 10mm (0.39 in)/12mm (0.47 in)
	S-NT360	

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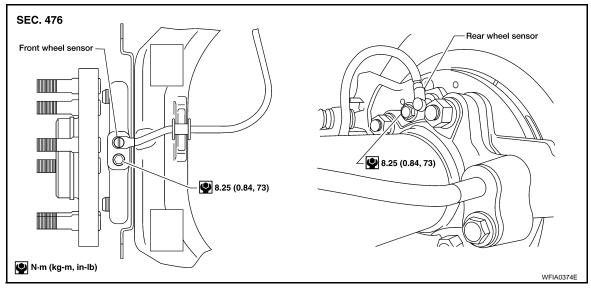
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REMOVAL AND INSTALLATION

WHEEL SENSORS

Removal and Installation





REMOVAL

- 1. Remove wheel sensor bolt.
 - When removing the front wheel sensor, first remove the disc rotor to gain access to the front wheel sensor bolt. Refer to BR-34, "Removal and Installation of Brake Caliper and Disc Rotor".
- 2. Pull out the sensor, being careful to turn it as little as possible.

CAUTION:

- · Be careful not to damage sensor edge and sensor rotor teeth.
- Do not pull on the sensor harness.
- 3. Disconnect wheel sensor harness electrical connector, then remove harness from mounts.

INSTALLATION

Installation is in the reverse order of removal. Tighten wheel sensor bolt to specification.

CAUTION:

Installation should be performed while paying attention to the following:

- Inspect wheel sensor O-ring, replace sensor assembly if damaged.
- Clean wheel sensor hole and mounting surface with brake cleaner and a lint-free shop rag. Be careful that dirt and debris do not enter the axle.
- Apply a coat of suitable grease to the wheel sensor O-ring and mounting hole. Refer to MA-10, "Fluids and Lubricants".

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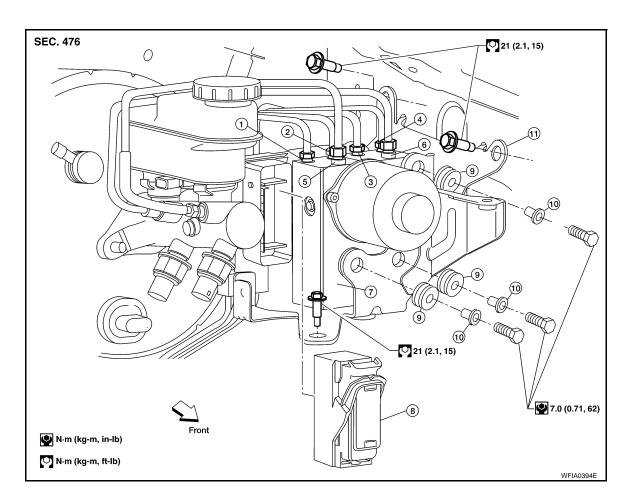
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ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation



- 1. Brake tube to rear left cylinder body 2.
- 4. Brake tube to front right cylinder body
- 7. ABS actuator and electric unit (control unit)
- 10. Collar

- . Brake tube to rear right cylinder body 3.
- From the master cylinder secondary 6. side
- 8. Harness connector

11. Bracket

- Brake tube to front left cylinder body
- From the master cylinder primary side
- 9. Grommet

REMOVAL

- 1. Disconnect the battery negative terminal.
- 2. Remove the cowl top extension. Refer to EXT-19, "Removal and Installation".
- 3. Drain the brake fluid. Refer to BR-16, "Drain and Refill".
- Disconnect the actuator harness connector from the ABS actuator and electric unit (control unit).
 CAUTION:
 - To remove the brake tubes, use a flare nut crowfoot and torque wrench to prevent the flare nuts and brake tubes from being damaged.
 - Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- Disconnect the brake tubes.
- 6. Remove the three bolts and remove the ABS actuator and electric unit (control unit).

INSTALLATION

Installation is in the reverse order of removal.

NOTE:

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< REMOVAL AND INSTALLATION >

[ABLS/ABS]

To install, use a flare nut crowfoot and torque wrench. Tighten brake tubes to specification when installing. Refer to <u>BR-12</u>, "Hydraulic Circuit".

 After installation of the ABS actuator and electric unit (control unit), refill the brake system with new brake fluid. Refer to MA-10, "Fluids and Lubricants". Then bleed the air from the system. Refer to BR-16, "Bleeding Brake System".

CAUTION:

Never reuse drained brake fluid.

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [VDC/TCS/ABS]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

PRECAUTIONS FOR DIAGNOSIS

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to BRC-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

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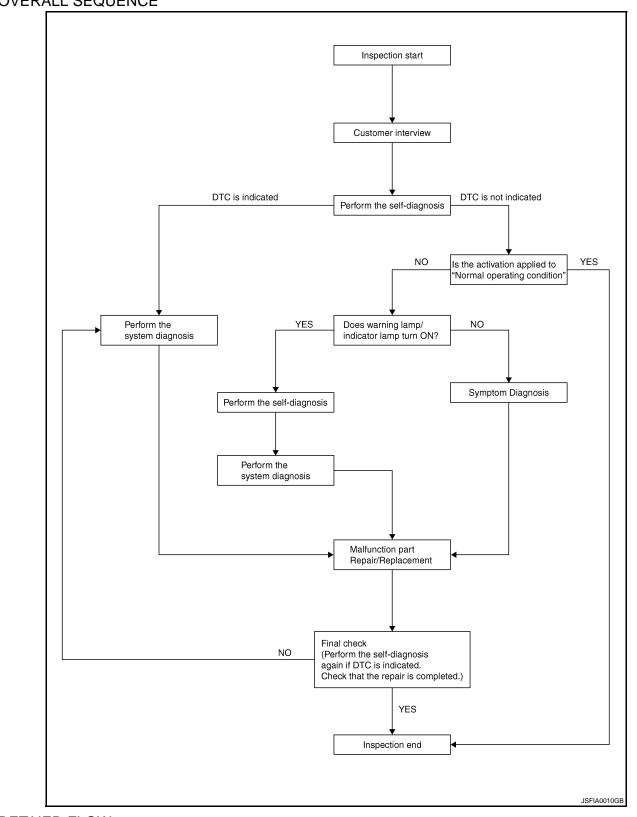
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< BASIC INSPECTION > OVERALL SEQUENCE



DETAIED FLOW

1. COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to BRC-149, "Diagnostic Work Sheet".

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [VDC/TCS/ABS]

>> GO TO 2

2.PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function. Refer to BRC-165, "CONSULT-III Function (ABS)".

Is there any DTC displayed?

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

3. PERFORM THE SYSTEM DIAGNOSIS

Perform the diagnosis applicable to the displayed DTC. Refer to BRC-239, "DTC No. Index".

>> GO TO 7

${f 4.}$ CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCTION

Check that the symptom is a normal operation that is not considered a system malfunction. Refer to BRC-248. <a href="Description".

Is the symptom a normal operation?

YES >> INSPECTION END

NO >> GO TO 5

5. CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.

- ABS warning lamp: Refer to BRC-222, "Description".
- Brake warning lamp: Refer to BRC-223, "Description".
- VDC OFF indicator lamp: Refer to BRC-224, "Description".
- SLIP indicator lamp: Refer to BRC-225, "Description".

Is ON/OFF timing normal?

YES >> GO TO 6 NO >> GO TO 2

6.PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom.

>> GO TO 7

7. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 8

8. FINAL CHECK

Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, erase the self-diagnosis memory. Refer to <u>BRC-165</u>, "CONSULT-III Function (ABS)".

Is no other DTC present and the repair completed?

YES >> INSPECTION END

NO >> GO TO 3

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[VDC/TCS/ABS]

Diagnostic Work Sheet

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

SFIA3265E

BRC-149

< BASIC INSPECTION >

INSPECTION AND ADJUSTMENT ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Description

INFOID:0000000001537123

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

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Special Repair Requirement

 ${f 1}$.PERFORM THE NEUTRAL POSITION ADJUSTMENT FOR THE STEERING ANGLE SENSOR

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to <u>BRC-150</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : <u>Special Repair Requirement</u>", GO TO 2

2.PERFORM CALIBRATION OF THE DECEL G SENSOR

Perform calibration of the decel G sensor.

>> Refer to <u>BRC-151</u>, <u>"CALIBRATION OF DECEL G SENSOR : Special Repair Requirement"</u>. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:0000000001537125

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	×

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION CAUTION:

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

ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

INSPECTION AND ADJUSTMENT [VDC/TCS/ABS] < BASIC INSPECTION > >> GO TO 2 Α 2.PERFORM THE NEUTRAL POSITION ADJUSTMENT FOR THE STEERING ANGLE SENSOR On the CONSULT-III screen, touch "WORK SUPPORT" and "ST ANG SEN ADJUSTMENT" in order. 2. Touch "START". В **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:** D Be sure to perform above operation. >> GO TO 3 Е 3.CHECK DATA MONITOR Run vehicle with front wheels in straight-ahead position, then stop. **BRC** Select "DATA MONITOR". Then make sure "STR ANGLE SIG" is within 0±2.5°. Is the steering angle within the specified range? YES >> GO TO 4 NO >> Perform the neutral position adjustment for the steering angle sensor again, GO TO 1 4. ERASE THE SELF-DIAGNOSIS MEMORY Erase the self-diagnosis memory of the ABS actuator and electric unit (control unit) and ECM. Н ABS actuator and electric unit (control unit): Refer to BRC-165, "CONSULT-III Function (ABS)". • ECM: Refer to EC-67, "CONSULT-III Function (ENGINE)". Are the memories erased? YFS >> INSPECTION END NO >> Check the items indicated by the self-diagnosis. CALIBRATION OF DECEL G SENSOR CALIBRATION OF DECEL G SENSOR: Description INFOID:0000000001537127 Refer to the table below to determine if calibration of the decel G sensor is required. ×: Required -: Not required L

	· · · · · · · · · · · · · · · · · · ·
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 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	×

CALIBRATION OF DECEL G SENSOR : Special Repair Requirement

INFOID:0000000001537128

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CALIBRATION OF DECEL G SENSOR

CAUTION:

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

< BASIC INSPECTION > [VDC/TCS/ABS]

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-III 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 ±.

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-165, "CONSULT-III Function (ABS)".
- ECM: Refer to EC-67, "CONSULT-III Function (ENGINE)".

Are the memories erased?

YES >> INSPECTION END

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

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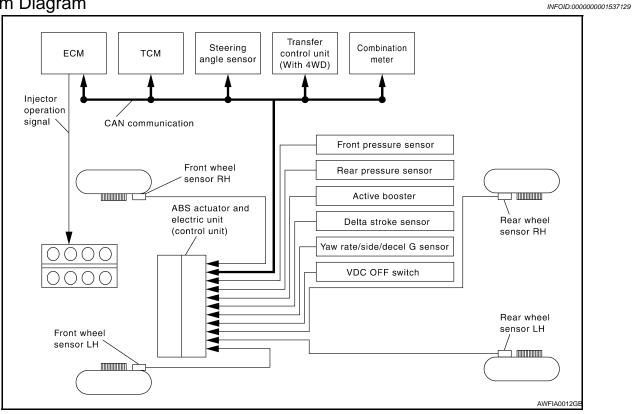
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FUNCTION DIAGNOSIS

VDC

System Diagram



System Description

pedal travel from

 Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from steering angle sensor and pressure sensors. Using information from yaw rate/side/decel G sensor and wheel sensor, VDC judges driving condition (conditions of under steer and over steer) to improve vehicle driving stability by controlling brake application to 4 wheels and engine output.

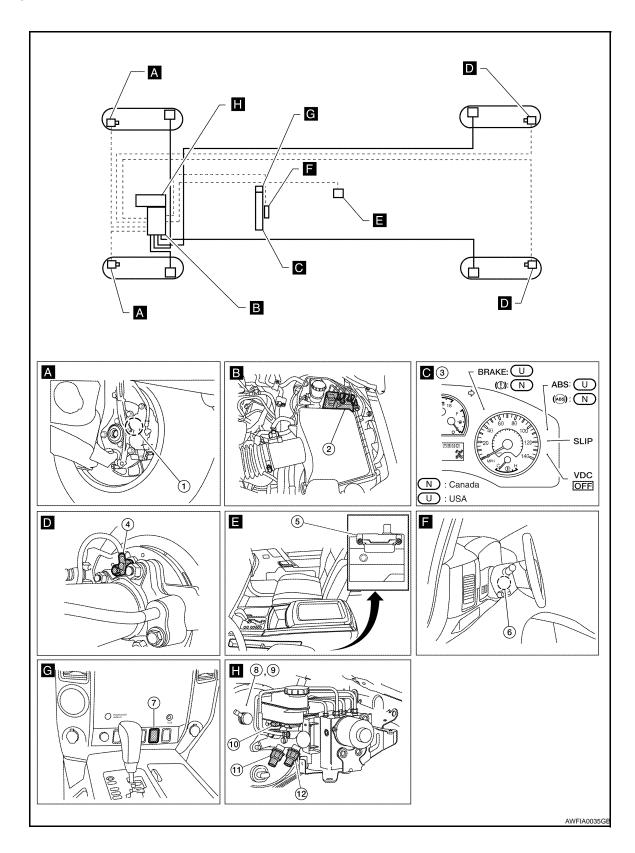
During VDC operation, it informs driver of system operation by flashing SLIP indicator lamp.

Electrical system diagnosis by CONSULT-III is available.

BRC-153

Component Parts Location

INFOID:0000000001537131



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1.	Front wheel sensor LH E18 RH E117	2.	ABS actuator and electric unit (control unit) E125	3.	Combination meter M24, M25	
4.	Rear wheel sensor LH C11 RH C10	5.	Yaw rate/side/decel G sensor M108	6.	Steering angle sensor M47	
7.	VDC OFF switch M148	8.	Active booster E49	9.	Delta stroke sensor E114	
10.	Brake fluid level switch E21	11.	Front pressure sensor E31	12.	Rear pressure sensor E32	(
۰ _{om}	nonent Description					

Component Description

INFOID:0000000001537132

Compo	nent parts	Reference	1
	Pump	BRC-179, "Description"	Е
	Motor	BRC-179, Description	_
ABS actuator and electric unit (control unit)	Actuator relay	BRC-197, "Description"	
The detailer and electric and (control and)	Solenoid valve	BRC-189, "Description"	BRC
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-211, "Description"	•
Wheel sensor		BRC-170, "Description"	G
Yaw rate/side/decel G sensor		BRC-181, "Description"	
Steering angle sensor	BRC-202, "Description"	Н	
VDC OFF switch		BRC-220, "Description"	
ABS warning lamp		BRC-222, "Description"	•
Brake warning lamp		BRC-223, "Description"	
VDC OFF indicator lamp		BRC-224, "Description"	•
SLIP indicator lamp		BRC-225, "Description"	
Front pressure sensor		DDC 400 "Deceriation"	J
Rear pressure sensor	BRC-199, "Description"		
Active booster		BRC-214, "Description"	K
Delta stroke sensor		BRC-217, "Description"	٠

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TCS

System Diagram

INFOID:0000000001675419 Transfer Steering Combination ECM ТСМ control unit angle sensor meter (With 4WD) Injector operation signal CAN communication Front pressure sensor Front wheel Rear pressure sensor sensor RH Active booster ABS actuator and electric unit Rear wheel Delta stroke sensor (control unit) sensor RH Yaw rate/side/decel G sensor VDC OFF switch Rear wheel sensor LH Front wheel sensor LH

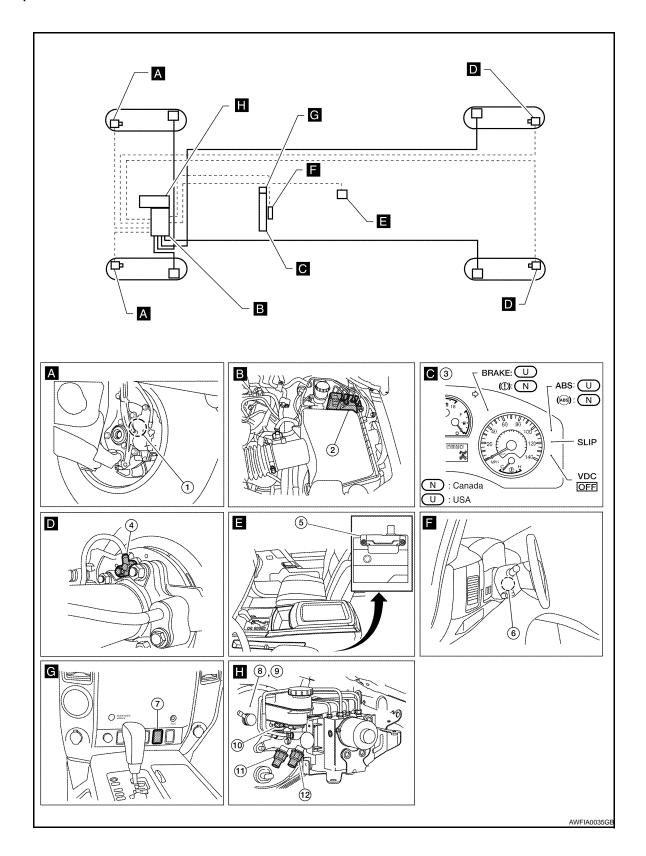
System Description

INFOID:0000000001537134

- Traction Control System is a function that electronically controls engine torque, brake fluid pressure and A/T gear position to ensure the optimum slippage ratio at drive wheels by computing wheel speed signals from 4 wheel sensors. When ABS actuator and electric unit (control unit) detects a spin at drive wheels (rear wheels), it compares wheel speed signals from all 4 wheels. At this time, LH and RH rear brake fluid pressure are controlled, while fuel being cut to engine and throttle valve being closed to reduce engine torque by the control unit. Further more, throttle position is continuously controlled to ensure the optimum engine torque at all times.
- During TCS operation, it informs driver of system operation by flashing SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.

Component Parts Location

INFOID:0000000001675420



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1.	Front wheel sensor LH E18 RH E117	2.	ABS actuator and electric unit (control unit) E125	3.	Combination meter M24, M25
4.	Rear wheel sensor LH C11 RH C10	5.	Yaw rate/side/decel G sensor M108	6.	Steering angle sensor M47
7.	VDC OFF switch M148	8.	Active booster E49	9.	Delta stroke sensor E114
10.	Brake fluid level switch E21	11.	Front pressure sensor E31	12.	Rear pressure sensor E32

Component Description

INFOID:0000000001675421

Compo	Component parts		
Pump Motor		BRC-179, "Description"	
ABS actuator and electric unit (control unit)	Actuator relay	BRC-197, "Description"	
7.50 actuator and clocking unit (control unit)	Solenoid valve	BRC-189, "Description"	
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-211, "Description"	
Wheel sensor		BRC-170, "Description"	
Yaw rate/side/decel G sensor		BRC-181, "Description"	
Steering angle sensor		BRC-202, "Description"	
VDC OFF switch		BRC-220, "Description"	
ABS warning lamp		BRC-222, "Description"	
Brake warning lamp		BRC-223, "Description"	
VDC OFF indicator lamp		BRC-224, "Description"	
SLIP indicator lamp		BRC-225, "Description"	
Front pressure sensor	DDC 100 "Decemention"		
Rear pressure sensor	BRC-199, "Description"		
Active booster		BRC-214, "Description"	
Delta stroke sensor		BRC-217, "Description"	

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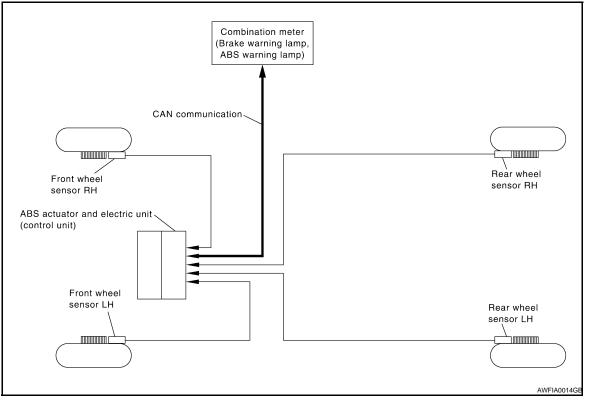
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ABS

System Diagram



System Description

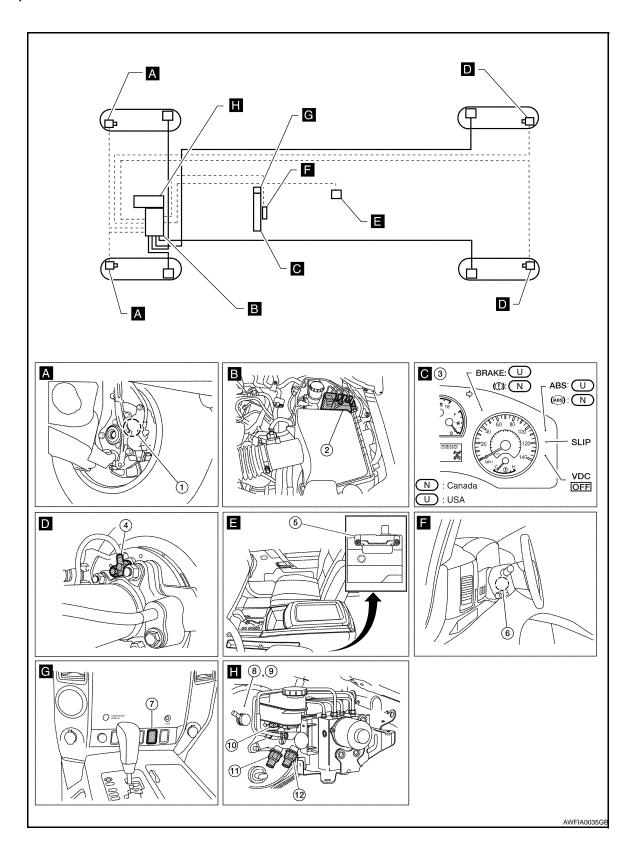
INFOID:0000000001537138

 Anti-Lock Braking System is a function that detects wheel revolution while braking, electronically controls braking force, and prevents wheel locking during sudden braking. It improves handling stability and maneuverability for avoiding obstacles.

• Electrical system diagnosis by CONSULT-III is available.

Component Parts Location

INFOID:0000000001675422



ABS

< FUNCTION DIAGNOSIS >	[VDC/TCS/ABS]	

1.	Front wheel sensor LH E18 RH E117	2.	ABS actuator and electric unit (control unit) E125	3.	Combination meter M24, M25	А
4.	Rear wheel sensor LH C11 RH C10	5.	Yaw rate/side/decel G sensor M108	6.	Steering angle sensor M47	В
7.	VDC OFF switch M148	8.	Active booster E49	9.	Delta stroke sensor E114	
10.	Brake fluid level switch E21	11.	Front pressure sensor E31	12.	Rear pressure sensor E32	C

Component Description

INFOID:0000000001537140

Compo	Reference	
ABS actuator and electric unit (control unit)	Pump	BRC-179, "Description"
	Motor	BIC-179, Description
	Actuator relay	BRC-197, "Description"
	Solenoid valve	BRC-189, "Description"
Wheel sensor		BRC-170, "Description"
ABS warning lamp		BRC-222, "Description"
Brake warning lamp		BRC-223, "Description"

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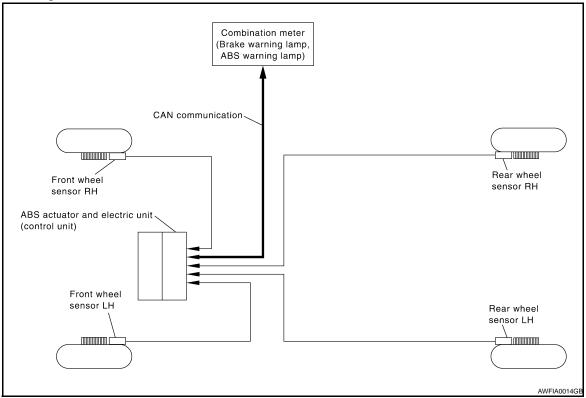
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EBD

System Diagram

INFOID:0000000001675423



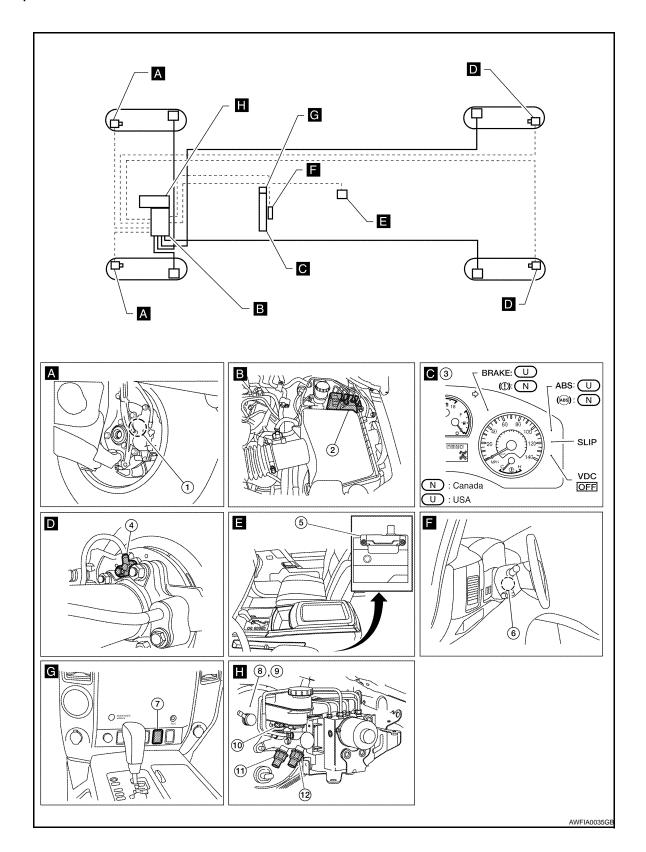
System Description

INFOID:0000000001537142

- Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then it electronically controls the rear braking force (brake fluid pressure) to reduce rear wheel slippage. Accordingly, it improves vehicle stability.
- Electrical system diagnosis by CONSULT-III is available.

Component Parts Location

INFOID:0000000001675424



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1.	Front wheel sensor LH E18 RH E117	2.	ABS actuator and electric unit (control unit) E125	3.	Combination meter M24, M25
4.	Rear wheel sensor LH C11 RH C10	5.	Yaw rate/side/decel G sensor M108	6.	Steering angle sensor M47
7.	VDC OFF switch M148	8.	Active booster E49	9.	Delta stroke sensor E114
10.	Brake fluid level switch E21	11.	Front pressure sensor E31	12.	Rear pressure sensor E32

Component Description

INFOID:0000000001675425

Component parts		Reference
	Pump	BRC-179, "Description"
ABS actuator and electric unit (control unit)	Motor	BRC-179, Description
	Actuator relay	BRC-197, "Description"
	Solenoid valve	BRC-189, "Description"
Wheel sensor	BRC-170, "Description"	
ABS warning lamp		BRC-222, "Description"
Brake warning lamp		BRC-223, "Description"

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

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

CONSULT-III Function (ABS)

INFOID:0000000001537145

FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.
Self-diagnostic results	Self-diagnostic results 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 is which CONSULT-III drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.
ECU part number	ABS actuator and electric unit (control unit) part number can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.

SELF-DIAG RESULTS MODE

Operation Procedure

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

How to Erase Self-diagnosis Results

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

CAUTION:

If memory cannot be erased, perform applicable diagnosis. NOTE:

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

Display Item List

Refer to BRC-239, "DTC No. Index".

DATA MONITOR MODE

Display Item List

Item	Data	a monitor item sele		
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
GEAR	×	×	×	Gear position judged by PNP switch signal is displayed.
FR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
FR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
RR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.

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< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

14	Data	a monitor item sele	ection	
Item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
RR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.
N POSI SIG	-	-	×	Shift position judged by PNP switch signal.
P POSI SIG	-	-	×	Shift position judged by PNP switch signal.
ACCEL POS SIG (%)	×	-	×	Throttle valve open/close status judged by CAN communication signal is displayed.
ENGINE SPEED (rpm)	×	×	×	Engine speed judged by CAN communication signal is displayed.
STR ANGLE SIG (deg)	×	-	×	Steering angle detected by steering angle sensor is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor is displayed.
SIDE G-SENSOR (m/s²)	×	-	×	Transverse acceleration detected by side G-sensor is displayed.
DECEL G-SEN (G)	×	×	×	Longitudinal acceleration detected by decel G-sensor is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
OFF SW (ON/OFF)	×	×	×	VDC OFF switch (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	-	×	×	ABS warning lamp (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	-	×	×	SLIP indicator lamp (ON/OFF) status is displayed.
FR LH IN SOL (ON/OFF)	-	×	×	Front LH IN ABS solenoid (ON/ OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	-	×	×	Front LH OUT ABS solenoid (ON/ OFF) status is displayed.
RR RH IN SOL (ON/OFF)	-	×	×	Rear RH IN ABS solenoid (ON/ OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	-	×	×	Rear RH OUT ABS solenoid (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	-	×	×	Front RH IN ABS solenoid (ON/ OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	-	×	×	Front RH OUT ABS solenoid (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	-	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	-	×	×	Rear LH OUT ABS solenoid (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	-	×	×	OFF Lamp (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	-	×	×	ABS motor relay signal (ON/OFF) status is displayed.

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

Item		a monitor item sele		Dors - de-
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
ACTUATOR RLY (ON/OFF)	-	×	×	ABS actuator relay signal (ON/OFF) status is displayed.
CV1 (ON/OFF)	-	-	×	Front side switch-over solenoid valve (cut valve) (ON/OFF) status is displayed.
CV2 (ON/OFF)	-	-	×	Rear side switch-over solenoid valve (cut-valve) (ON/OFF) status is displayed.
SV1 (ON/OFF)	-	-	×	Front side switch-over solenoid valve (suction valve) (ON/OFF) status is displayed.
SV2 (ON/OFF)	_	-	×	Rear side switch-over solenoid valve (suction valve) (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	-	-	×	VDC fail signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	-	_	×	TCS fail signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	-	-	×	ABS fail signal (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	-	_	×	EBD fail signal (ON/OFF) status is displayed.
FLUID LEV SW (ON/OFF)	×	_	×	Brake fluid level switch (ON/OFF) status is displayed.
EBD SIGNAL (ON/OFF)	-	_	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	-	-	×	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	-	-	×	TCS operation (ON/OFF) status is displayed.
VDC SIGNAL (ON/OFF)	-	-	×	VDC operation (ON/OFF) status is displayed.
EBD WARN LAMP	-	-	×	Brake warning lamp (ON/OFF) status is displayed.
SLCT LVR POSI	×	×	×	Shift position judged by PNP switch signal.
R POSI SIG	-	-	×	Shift position judged by PNP switch signal.
2WD/4WD	-	_	×	It recognizes on software whether it is 2WD and whether it is in 4WD state.
BST OPER SIG	-	_	×	Active booster operation (ON/OFF) status is displayed.
PRESS SENSOR	×	_	×	Brake pressure detected by pressure sensor is displayed.
CRANKING SIG	-	-	×	The input state of the key SW START position signal is displayed.
PRESS SEN 2	_	_	×	Brake pressure detected by pressure sensor is displayed.
DELTA S SEN	_	-	×	The amount of stroke sensor movements in the active booster detected by DELTA S SEN is displayed.

< FUNCTION DIAGNOSIS >				[VDC/TCS/ABS]
ltem	Data	a monitor item sele		
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
				5

Item	Data	a monitor item sele	ction		
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks	
RELEASE SW NO	-	-	×	Release switch signal (ON/OFF) status is displayed. "ON" indicates that the brake pedal is depressed. "OFF" is that the brake pedal is released.	
RELEASE SW NC	-	_	×	Release switch signal (ON/OFF) status is displayed. "OFF" indicates that the brake pedal is depressed on. "ON" is that the brake pedal is released.	
OHB FAIL	_	_	×	OHB fail status is displayed.	
HBA FAIL	_	_	×	HBA fail status is displayed.	
OHB SIG	-	_	×	OHB operation (ON/OFF) status is displayed.	
HBA SIG	-	-	×	HBA operation (ON/OFF) status is displayed.	
PRES CTRL ACC	_	_	×	This item is not used for this model.	
PRES FAIL ACC	_	_	×	This item is not used for this model.	
STP OFF RLY	-	-	×	Stop lamp relay signal (ON/OFF) status is displayed.	

^{×:} Applicable

ACTIVE TEST MODE

CAUTION:

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

NOTE:

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

Test Item

SOLENOID VALVE

- When performing an active test of the ABS function, select the "MAIN SIGNALS" for each test item. In addition, when performing an active test of the VDC/TCS function, select the item menu for each test item.
- For ABS solenoid valve, touch "UP", "KEEP", and "DOWN" on the display screen. For ABS solenoid valve (ACT), touch "UP", "ACT UP", "ACT KEEP" and confirm that solenoid valves operate as shown in the table below.

Operation		ABS solenoid valve			ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{-:} Not applicable

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

		ABS solenoid valve			ABS solenoid valve (ACT)		
Operation		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
REAR SUL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

ABS MOTOR

• Touch "ON" and "OFF" on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

BOOSTER DRIVE

Touch "UP" and "DOWN" on the screen. Check that booster drive operates as shown in table below.
 CAUTION:

Perform active test subject to the conditions below.

- Do not operate brake pedal during active test.
- Make sure the engine revolution is over 500 rpm.
- · Make sure the vehicle is not moving.

Operation	UP	DOWN
STOP LAMP SW	ON	OFF
BST OPER SIG	ON	OFF
PRESS SENSOR	50 ± 5 bar	0 bar
PRESS SEN 2	50 ± 5 bar	0 bar
STP OFF RLY	OFF	OFF

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COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description INFOID:000000001537146

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic (INFOID:000000001537147

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	Harness or connectorWheel sensor
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-1
RR LH SENSOR-1
FR RH SENSOR-1
FR LH SENSOR-1

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-170</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001537148

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector E125 and wheel sensor of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to BRC-253, "Removal and Installation".

3. CHECK TIRES

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

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

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

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and Service" (front) or <u>RAX-5</u>, "On-Vehicle Inspection" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-6</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

Wheel sensor connector WFIA0343E

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) harness connector E125 and the malfunctioning wheel sensor harness connector E18, E117, C10, or C11.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	•
Front LH		45	E18	1	
Front Lm		46		2	Yes
Front RH		34	E117	1	
	E125	33		2	
Rear LH	E 125	37	C11	2	165
		36		1	
Rear RH		42	C10	2	
		43	C10	1	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-255</u>, "Removal and Installation".

NO >> Repair the circuit.

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Component Inspection

INFOID:0000000001537149

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)	
FR LH SENSOR		
FR RH SENSOR	Nearly matches the speedometer dis-	
RR LH SENSOR	play (±10% or less)	
RR RH SENSOR		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-170, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:0000000001537150

${f 1}$. 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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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INFOID:0000000001675426

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description INFOID:000000001537151

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
C1106	RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	 Harness or connector Wheel sensor ABS actuator and electric unit (control unit)
C1107	FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
C1108	FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-2
RR LH SENSOR-2
FR RH SENSOR-2
FR LH SENSOR-2

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-173, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector E125 and wheel sensor of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

BRC-173

2.check wheel sensor output signal

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to <u>BRC-253, "Removal and Installation"</u>.

3. CHECK TIRES

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

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

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

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and Service" (front) or <u>RAX-5</u>, "On-Vehicle Inspection" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-6, "Removal and Installation"</u> (front) or <u>RAX-7, "Removal and Installation"</u> (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

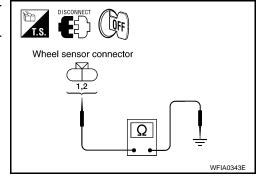
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) harness connector E125 and the malfunctioning wheel sensor harness connector E18, E117, C10, or C11.

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity	
	Connector	Terminal	Connector	Terminal		
Front LH		45	F40	1		
FIORI LM		46	E18	2		
Front RH	E125	34	E117	1	Yes	
		33		2		
Rear LH	E 123	37	C11	2	162	
Real Ln		36	CII	1		
Rear RH		42	C10	2		
		43		1		

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SEN-SOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)	
FR LH SENSOR		
FR RH SENSOR	Nearly matches the speedometer dis-	
RR LH SENSOR	play (±10% or less)	
RR RH SENSOR		

Is the inspection result normal?

YES >> INSPECTION END

>> Go to diagnosis procedure. Refer to <u>BRC-173</u>, "Diagnosis Procedure".

Special Repair Requirement

${f 1}$. 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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

Р >> END

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INFOID:0000000001675428

INFOID:0000000001675427

C1109 POWER AND GROUND SYSTEM

Description INFOID:000000001537156

Supplies electric power to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1109	BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
BATTERY VOLTAGE [ABNORMAL]	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-176, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001537158

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-165, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

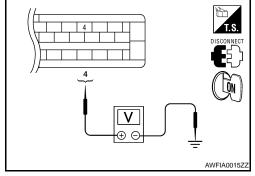
YES >> GO TO 2

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

$2. \mathsf{CHECK}$ abs actuator and electric unit (control unit) power supply circuit and ground circuit

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Turn ignition switch ON or OFF and check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

ABS actuator and electric unit (control unit)		_	Condition	Voltage
Connector	Terminal	•		
F125	4	Ground	Ignition switch: ON	Battery voltage
L 123	4	Giodila	Ignition switch: OFF	Approx. 0V



Turn ignition switch OFF.

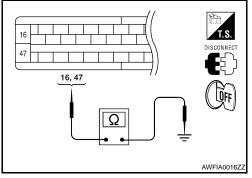
C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
E125	16, 47	Ground	Yes



Is the inspection result normal?

YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.

NO >> Repair or replace malfunctioning components.

Special Repair Requirement

INFOID:0000000001675429

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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item Malfunction detected condition		Possible cause	
C1110	CONTROLLER FAILURE When there is an internal malfunction in the ABS actuator and electric unit (control unit).		ABS actuator and electric unit (control unit)	
C1170	VARIANT CODING	In a case where VARIANT CODING is different.	(control drift)	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE
VARIANT CODING

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-178, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001537161

INSPECTION PROCEDURE

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

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installation".

Special Repair Requirement

INFOID:0000000001675430

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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:000000001537163

PUMP

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The pump returns the brake fluid stored in the reservoir to the master cylinder by reducing the pressure.

MOTOR

The motor drives the pump according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1111	PUMP MOTOR	During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open.	Harness or connector ABS actuator and electric unit (control unit)
		During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	

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DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-179, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001537165

INSPECTION PROCEDURE

1. CHECK CONNECTOR

Turn ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-165, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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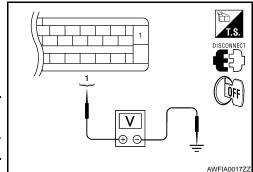
C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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

ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector	Terminal		
E125	1	Ground	Battery voltage



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

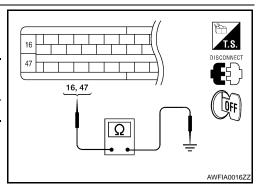
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

ABS actuator and ele	ectric unit (control unit)	_	Continuity
Connector	Terminal		
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



INFOID:0000000001537166

Component Inspection

1. CHECK ACTIVE TEST

- 1. On "ACTIVE TEST", select "ABS MOTOR".
- Touch ON and OFF on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-179, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000001675431

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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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

Description INFOID:000000001537168

The yaw rate/side/decel G sensor detects the yaw rate/side/decel G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1113	G-SENSOR	Longitudinal G-sensor is malfunctioning, or signal line of longitudinal G-sensor is open or shorted.	Harness or connector
C1145	YAW RATE SENSOR	Yaw rate sensor is malfunctioning, or the yaw rate sensor signal line is open or shorted.	ABS actuator and electric unit (control unit)
C1146	SIDE G-SEN CIRCUIT	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	Yaw rate/side/decel G sensor

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
G-SENSOR
YAW RATE SENSOR
SIDE G-SEN CIRCUIT

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-181, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

- Sudden turns (such as spin turns, acceleration turns), drifting, etc. when VDC function is OFF may
 cause the yaw rate/side/decel G sensor system to indicate a malfunction. This is not a malfunction if
 normal operation can be resumed after restarting the engine.
- If vehicle is on turn table at entrance to parking garage, or on other moving surface, VDC OFF indicator lamp may illuminate and CONSULT-III self-diagnosis may indicate yaw rate sensor system malfunction. However, in this case there is no malfunction in yaw rate sensor system. Take vehicle off of turn table or other moving surface, and start engine. Results will return to normal.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector E125 and yaw rate/side/decel G sensor connector M108.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2. YAW RATE/SIDE/DECEL G SENSOR HARNESS INSPECTION

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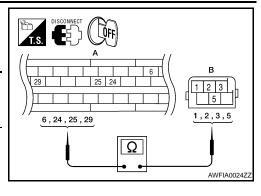
C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Check continuity between the ABS actuator and electric unit (control unit) connector E125 (A) and the yaw rate/side/decel G sensor connector M108 (B).

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector Terminal		
	6		3	
A: E125	24	B: M108	5	Yes
A. E 125	25		1	res
	29		2	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace as necessary.

3.YAW RATE/SIDE/DECEL G SENSOR INSPECTION

- 1. Connect the yaw rate/side/decel G sensor connector M108 and ABS actuator and electric unit (control unit) connector E125.
- 2. Use "DATA MONITOR" to check if the yaw rate/side/decel G sensor signals are normal.

Vehicle condition	YAW RATE SEN (DATA MONITOR)	SIDE G-SENSOR (DATA MONITOR)	DECEL G-SEN (DATA MONITOR)
Stopped	-4 to +4 deg/s	-1.1 to +1.1 m/s	-0.11 G to +0.11 G
Turning right	Negative value	Negative value	-
Turning left	Positive value	Positive value	-
Speed up	-	-	Negative value
Speed down	-	-	Positive value

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-255, "Removal and Installation"</u>.
- NO >> Replace the yaw rate/side/decel G sensor and perform calibration of decel G-sensor. Refer to BRC-258, "Removal and Installation".

Component Inspection

INFOID:0000000001537171

1. CHECK DATA MONITOR

Select "YAW RATE SEN", "SIDE G-SENSOR", "DECEL G-SEN" in "DATA MONITOR" and check yaw rate/side/decel G sensor signal.

Vehicle condition YAW RATE SEN (DATA MONITOR)		SIDE G-SENSOR (DATA MONITOR)	DECEL G-SEN (DATA MONITOR)
Stopped	-4 to +4 deg/s	-1.1 to +1.1 m/s	-0.11 G to +0.11 G
Turning right	Negative value	Negative value	-
Turning left	Positive value	Positive value	-
Speed up	-	-	Negative value
Speed down	-	-	Positive value

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-181, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:0000000001675432

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

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C1115 WHEEL SENSOR

Description INFOID:000000001537173

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic (INFOID:000000001537174

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	Harness or connectorWheel sensorABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

ABS SENSOR [ABNORMAL SIGNAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-184</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001675433

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector E125 and wheel sensor of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to <u>BRC-253, "Removal and Installation"</u>.

3.CHECK TIRES

< COMPONENT DIAGNOSIS >

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

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

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

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and <u>Service</u>" (front) or <u>RAX-5</u>, "On-Vehicle Inspection" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-6</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-7</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

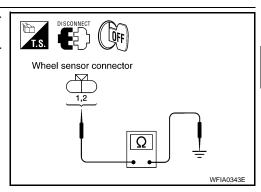
- Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) harness connector E125 and the malfunctioning wheel sensor harness connector E18, E117, C10, or C11.

Wheel sensor	ABS actuato electric unit (cor		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH		45	F40	1	
FIOIILEI		46	E18	2	
Front RH	E125	34	E117	1	Yes
TIOIRINI		33		2	
Rear LH	L 125	37	C11	2	163
Real LIT		36		1	
Rear RH	42	C10	2		
Redi Kri		43	C10	1	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-255</u>, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
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INFOID:0000000001675434

< COMPONENT DIAGNOSIS >

FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-184, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000001675435

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-150</u>. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1116 STOP LAMP SWITCH

Description INFOID:000000001537178

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1116	STOP LAMP SW	When stop lamp switch circuit is open.	Harness or connector Stop lamp switch ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-187</u>. "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- Disconnect the ABS actuator and electric unit (control unit) connector E125 and stop lamp switch connector E38.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

$2.\mathsf{stop}$ Lamp switch inspection

Check the voltage between the ABS actuator and electric unit (control unit) harness connector E125 terminal 41 and body ground.

Brake pedal depressed : Battery voltage

(approx. 12V)

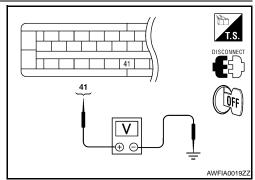
Brake pedal not depressed: Approx. 0V

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installation".

NO >> GO TO 3

 $3.\mathsf{s}$ top lamp relay circuit inspection



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C1116 STOP LAMP SWITCH

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

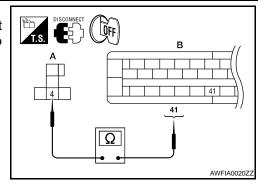
- 1. Disconnect the stop lamp relay harness connector E12.
- 2. Check the continuity between the ABS actuator and electric unit (control unit) harness connector E125 (B) terminal 41 and stop lamp relay harness connector E12 (A) terminal 4.

Continuity should exist.

Is the inspection result normal?

YES >> Refer to <u>EXL-3</u>, "Work Flow".

NO >> Repair or replace malfunctioning components.



INFOID:0000000001675436

Special Repair Requirement

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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1120, C1122, C1124, C1126 IN ABS SOL

Description INFOID:000000001537182

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1120	FR LH IN ABS SOL	When the control unit detects a malfunction in the front LH inlet solenoid circuit.	
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	ABS actuator and electric unit
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH inlet solenoid circuit.	(control unit)
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH inlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH IN ABS SOL
FR RH IN ABS SOL
RR LH IN ABS SOL
RR RH IN ABS SOL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-189</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-165</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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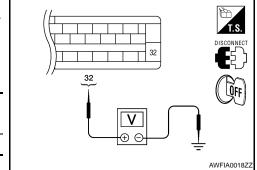
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- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage	
Connector	Terminal			
E125	32	Ground	Battery voltage	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.check solenoid, vdc switch-over valve and acuator relay ground circuit

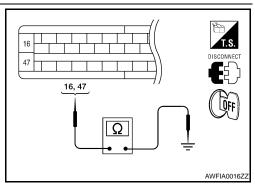
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal	_		
E125	16, 47	Ground	Yes	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-255</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



INFOID:0000000001537185

Component Inspection

1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- 2. On the display, touch "UP", "KEEP", and "DOWN", and check that the system operates as shown in the table below.

Operation		AE	SS solenoid va	alve	ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
NEAN OOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

Is the inspection result normal?

YES >> INSPECTION END

C1120, C1122, C1124, C1126 IN ABS SOL

31120, 31122, 31124, 31120 III ABS 332		
< COMPONENT DIAGNOSIS >	[VDC/TCS/ABS]	
NO >> Go to diagnosis procedure. Refer to <u>BRC-189</u> , " <u>Diagnosis Procedure</u> ".		
Special Repair Requirement	INFOID:000000001675437	А
1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION		R
Always perform neutral position adjustment for the steering angle sensor when replace and electric unit (control unit). Refer to BRC-150 , "ADJUSTMENT OF STEERING AN		
TRAL POSITION: Description".		С

>> 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

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C1121, C1123, C1125, C1127 OUT ABS SOL

Description INFOID:000000001537187

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1121	FR LH OUT ABS SOL	When the control unit detects a malfunction in the front LH outlet solenoid circuit.	
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	ABS actuator and electric unit
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	(control unit)
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH OUT ABS SOL
FR RH OUT ABS SOL
RR LH OUT ABS SOL
RR RH OUT ABS SOL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-192, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001675438

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-165</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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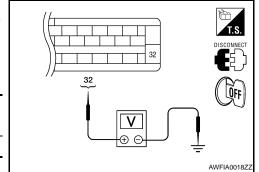
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- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage	
Connector	Terminal			
E125	32	Ground	Battery voltage	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.check solenoid, vdc switch-over valve and acuator relay ground circuit

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

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal	_		
E125	16, 47	Ground	Yes	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-255</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

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INFOID:0000000001675439

Component Inspection

1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- 2. On the display, touch "UP", "KEEP", and "DOWN", and check that the system operates as shown in the table below.

					450		(A OT)
Operation		ABS solenoid valve			ABS solenoid valve (ACT)		
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
NEAN SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

Is the inspection result normal?

YES >> INSPECTION END

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C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

NO >> Go to diagnosis procedure. Refer to BRC-192, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000001675440

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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

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C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description INFOID:000000001537192

ABS actuator and electric unit (control unit) and ECM exchange the engine signal with CAN communication line.

DTC Logic

DTC DETECTION LOGIC

_	DTC	Display item	Malfunction detected condition	Possible cause		
_	C1130	ENGINE SIGNAL 1	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine fuel cut system is malfunctioning.			
_	C1131	ENGINE SIGNAL 2		Harness or connectorABS actuator and electric unit		
_	C1132	ENGINE SIGNAL 3		(control unit)		
_	C1133	ENGINE SIGNAL 4		ECMCAN communication line		
_	C1136	ENGINE SIGNAL 6				

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 6

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-195, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001537194

INSPECTION PROCEDURE

1. CHECK ENGINE SYSTEM

- 1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to EC-67, "CONSULT-III Function (ENGINE)".
- Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-165</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace the affected part.

NO >> INSPECTION END

Special Repair Requirement

INFOID:0000000001675441

${f 1}$.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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

$2. \hbox{\footnotesize calibration of decel g sensor}$

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1140 ACTUATOR RLY

Description INFOID:0000000001537196

Activates or deactivates each solenoid valve according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	ABS actuator relay or circuit malfunction.	Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ACTUATOR RLY

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-197</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-165, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

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

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal	Terminal	
E125	32	Ground	Battery voltage

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Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

 ${f 3.}$ CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

>> Replace ABS actuator and electric unit (control unit). YES Refer to BRC-255, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

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INFOID:0000000001537199

Component Inspection

1. CHECK ACTIVE TEST

- On "ACTIVE TEST", select "ABS MOTOR".
- Touch ON and OFF on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

YES >> INSPECTION END

>> Go to diagnosis procedure. Refer to BRC-197, "Diagnosis Procedure". NO

Special Repair Requirement

INFOID:0000000001675443

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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1142 PRESS SENSOR

Description INFOID:0000000001537201

The front and rear pressure sensors convert the brake fluid pressure to an electric signal and transmit it to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1142	PRESS SEN CIRCUIT	Pressure sensor signal line is open or shorted, or pressure sensor is malfunctioning.	 Harness or connector Pressure sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PRESS SEN CIRCUIT

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-199</u>. "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

Diagnosis Procedure

FRONT PRESSURE SENSOR INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- 1. Turn the ignition switch OFF.
- 2. Disconnect the front pressure sensor connector E31 and ABS actuator and electric unit (control unit) connector E125 and inspect the terminals for deformation, disconnection, looseness, or damage.

Is the inspection result normal?

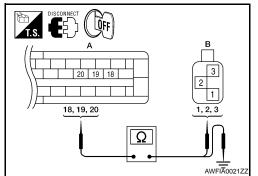
YES >> GO TO 2

NO >> Repair connector.

2.FRONT PRESSURE SENSOR CIRCUIT INSPECTION

 Measure the continuity between the ABS actuator and electric unit (control unit) harness connector E125 (A) and front pressure sensor harness connector E31 (B).

	and electric unit ol unit)	Front pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
	18		3	
A: E125	19	B: E31	1	Yes
	20		2	



Measure the continuity between the ABS actuator and electric unit (control unit) harness connector E125

 (A) and body ground.

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ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
	18		
A: E125	19	Ground	No
	20		

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

3.front pressure sensor inspection

- 1. Reconnect the front pressure sensor and ABS actuator and electric unit (control unit) connectors.
- Use "DATA MONITOR" to check if the status of "PRESS SENSOR" is normal.

Condition	PRESS SENSOR (DATA MONITOR)
With ignition switch turned ON and brake pedal released.	Approx. 0 bar
With ignition switch turned ON and brake pedal depressed.	Positive value

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the front pressure sensor.

REAR PRESSURE SENSOR INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- 1. Turn the ignition switch OFF.
- 2. Disconnect the rear pressure sensor connector E32 and ABS actuator and electric unit (control unit) connector E125 and inspect the terminals for deformation, disconnection, looseness, or damage.

Is the inspection result normal?

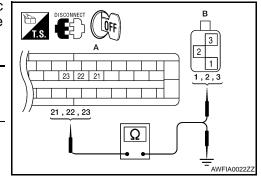
YES >> GO TO 2

NO >> Repair connector.

2. REAR PRESSURE SENSOR CIRCUIT INSPECTION

 Measure the continuity between the ABS actuator and electric unit (control unit) harness connector E125 (A) and rear pressure sensor harness connector E32 (B).

	and electric unit ol unit)	Rear pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
	21		1	
A: E125	22	B: E32	3	Yes
	23		2	



Measure the continuity between the ABS actuator and electric unit (control unit) harness connector E125

 (A) and body ground.

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
	21		-
A: E125	22	Ground	No
	23		

C1142 PRESS SENSOR [VDC/TCS/ABS] < COMPONENT DIAGNOSIS > Is the inspection result normal? Α YES >> GO TO 3 NO >> Repair or replace harness or connector. 3.rear pressure sensor inspection Reconnect the rear pressure sensor and ABS actuator and electric unit (control unit) connectors. Use "DATA MONITOR" to check if the status of "PRESS SEN2" is normal. 2. PRESS SEN2 Condition (DATA MONITOR) With ignition switch turned ON and brake pedal released. Approx. 0 bar D With ignition switch turned ON and brake pedal depressed. Positive value Is the inspection result normal? Е >> Inspection End. NO >> Replace the rear pressure sensor. Component Inspection INFOID:0000000001537204 **BRC** 1. CHECK DATA MONITOR On "DATA MONITOR", select "PRESS SENSOR" and "PRESS SEN2" and check the brake fluid pressure. PRESS SENSOR Condition and PRESS SEN2 Н (DATA MONITOR) With ignition switch turned ON and brake pedal released. Approx. 0 bar With ignition switch turned ON and brake pedal depressed. Positive value Is the inspection result normal? YES >> INSPECTION END >> Go to diagnosis procedure. Refer to BRC-199, "Diagnosis Procedure". NO Special Repair Requirement INFOID:0000000001675444 K ${f 1}$. 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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

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C1143, C1144 STEERING ANGLE SENSOR

Description INFOID:000000001537206

The steering angle sensor detects the rotation amount, angular velocity and direction of the steering wheel, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1143	ST ANG SEN CIRCUIT	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	Harness or connector Steering angle sensor
C1144	ST ANG SEN SIGNAL	Neutral position of steering angle sensor is not finished.	4WAS control unit (4WAS models) ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
ST ANG SEN CIRCUIT	
ST ANG SEN SIGNAL	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-202, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001537208

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect steering angle sensor connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 5. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-165, "CONSULT-III Function (ABS)"

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

2.CHECK STEERING ANGLE SENSOR HARNESS

- Turn ignition switch OFF.
- Disconnect steering angle sensor connector.

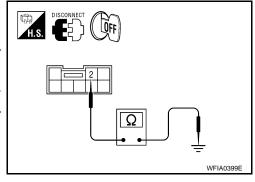
C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Check continuity between steering angle sensor harness connector terminal and ground.

Steering a	Steering angle sensor		Continuity
Connector	Terminal		Continuity
M47	2	Ground	Yes



Turn ignition switch ON.

Check voltage between steering angle sensor harness connector terminal and ground.

Steering a	ngle sensor		Voltage
Connector	Terminal	- — Voltag	voltage
M47	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

H.S. DISCONNECT CON 3

3. CHECK DATA MONITOR

1. Connect the steering angle sensor connector and ABS actuator and electric unit (control unit) connector.

2. Select "STR ANGLE SIG" in "DATA MONITOR" and check steering angle sensor signal.

Steering condition	STR ANGLE SIG (DATA MONITOR)
Driving straight	±2.5 °
Turn 90 ° to right	Approx. +90 °
Turn 90 ° to left	Approx. –90 °

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-255</u>, "Removal and Installation".

NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to <u>BRC-257</u>, "Removal and Installation".

Component Inspection

1. CHECK DATA MONITOR

Select "STR ANGLE SIG" in "DATA MONITOR" and check steering angle sensor signal.

Steering condition	STR ANGLE SIG (DATA MONITOR)
Driving straight	±2.5 °
Turn 90 ° to right	Approx. +90 °
Turn 90 ° to left	Approx. –90 °

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-202, "Diagnosis Procedure".

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1155 BRAKE FLUID LEVEL SWITCH

Description INFOID:000000001537211

The brake fluid level switch converts the brake fluid level to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

	DTC	Display item	Malfunction detected condition	Possible cause	[
•	C1155	BR FLUID LEVEL LOW	Brake fluid level is low or communication line between the ABS actuator and electric unit (control unit) and brake fluid level switch is open or shorted.	Harness or connector Brake fluid level switch Brake fluid level	[

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BR FLUID LEVEL LOW

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-205, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- Disconnect ABS actuator and electric unit (control unit) connector E125 and brake fluid level switch connector E21.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK HARNESS BETWEEN BRAKE FLUID LEVEL SWITCH AND ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

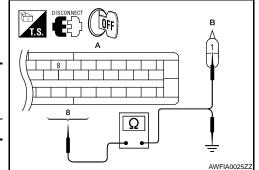
 Check continuity between ABS actuator and electric unit (control unit) harness connector E125 (A) and brake fluid level switch harness connector E21 (B).

	and electric unit ol unit)	Brake fluid	level switch	Continuity
Connector	Terminal	Connector	Terminal	
A: E125	8	B: E21	1	Yes

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

ABS actuator and ele	ectric unit (control unit)	Continuity	
Connector	Terminal	— Continuity	Continuity
A: E125	8	Ground	No

Is the inspection result normal?



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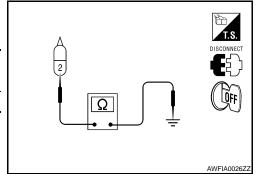
YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK BRAKE FLUID LEVEL SWITCH GROUND

Check continuity between brake fluid level switch harness connector E21 and ground.

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



Is the inspection result normal?

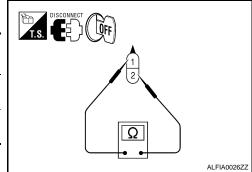
YES >> GO TO 4

NO >> Repair or replace malfunctioning components.

4. CHECK BRAKE FLUID LEVEL SWITCH

Check continuity between brake fluid level switch terminals.

Brake fluid level switch	Condition	Continuity
Terminal	Condition	
1-2	When brake fluid is full in the reservoir tank.	No
1 – 2	When brake fluid is empty in the reservoir tank.	Yes



Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results

appear, replace ABS actuator and electric unit (control unit). Refer to <u>BRC-255, "Removal and Installation"</u>.

NO >> Replace brake fluid level switch.

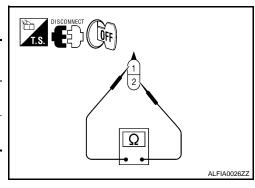
Component Inspection

INFOID:0000000001537214

1. CHECK BRAKE FLUID LEVEL SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect brake fluid level switch connector.
- 3. Check continuity between brake fluid level switch terminals.

Brake fluid level switch	Condition	Continuity
Terminal	Condition	Continuity
1 – 2	When brake fluid is full in the reservoir tank.	No
1 – 2	When brake fluid is empty in the reservoir tank.	Yes



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake fluid level switch.

Special Repair Requirement

INFOID:0000000001675446

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-150</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

>> GO TO 2

$2. \hbox{\footnotesize calibration of decel g sensor}$

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-151, "CALIBRATION OF DECEL G SENSOR: Description".

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C1156 ST ANG SEN COM CIR

Description INFOID:000000001537216

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1156	ST ANG SEN COM CIR	When steering angle sensor is not transmitting CAN communication signal to the ABS actuator and electric unit (control unit).	Harness or connector CAN communication line Steering angle sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
ST ANG SEN COM CIR	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-208, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001537218

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E125, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 2. Reconnect connector and perform self-diagnosis.

Self-diagnosis results
CAN COMM CIRCUIT
ST ANG SEN COM CIR

Is above displayed on the self-diagnosis display?

YES >> Refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> INSPECTION END

C1160 DECEL G SEN SET

Description INFOID:000000001537219

The yaw rate/side/decel G sensor detects the yaw rate/side/decel G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1160	DECEL G SEN SET	ABS decel G sensor adjustment is incomplete.	Decel G sensor calibration Yaw rate/side/decel G sensor ABS actuator and electric unit (control unit)	Е

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
DECEL G SEN SET

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-209. "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis.

Self-diagnosis results
DECEL G SEN SET

Do self-diagnosis results indicate anything other than shown above?

YES >> Perform repair or replacement for the item indicated.

NO >> Perform calibration of decel G sensor. Refer to <u>BRC-151</u>, "CALIBRATION OF <u>DECEL G SENSOR</u> : <u>Description</u>". GO TO 2

2.PERFORM SELF-DIAGNOSIS AGAIN

- 1. Turn the ignition switch to OFF and then to ON and erase self-diagnosis results.
- 2. Perform ABS actuator and electric unit (control unit) self-diagnosis again.

Are any self-diagnosis results displayed?

YES >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-258</u>, "Removal and Installation".

NO >> INSPECTION END

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INFOID:0000000001537221

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C1163 ST ANGLE SEN SAFE

Description INFOID:000000001537222

The steering angle sensor detects the rotation amount, angular velocity and direction of the steering wheel, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1163	ST ANGL SEN SAFE	When steering angle sensor is in safe mode.	Adjust steering angle sensor neutral position

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ST ANGL SEN SAFE

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-210, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001537224

INSPECTION PROCEDURE

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Adjust steering angle sensor neutral position. Refer to <u>BRC-150</u>, "ADJUSTMENT OF STEERING ANGLE <u>SENSOR NEUTRAL POSITION: Description"</u>.

>> GO TO 2

2.INDICATOR LAMP CHECK

Check that VDC OFF indicator lamp is off.

Is VDC OFF indicator lamp off?

YES >> INSPECTION END

NO >> Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-165, "CON-SULT-III Function (ABS)"</u>.

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INFOID:0000000001675447

C1164, C1165, C1166, C1167 CV/SV SYSTEM

Description INFOID:000000001537225

CV1, CV2 (CUT VALVE)

The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

SV1, SV2 (SUCTION VALVE)

The suction valve supplies the brake fluid from the master cylinder to the pump, when VDC/TCS is activated.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1164	CV1	VDC switch-over solenoid valve (CV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	
C1165	CV2	VDC switch-over solenoid valve (CV2) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	Harness or connector ABS actuator and electric unit
C1166	SV1	VDC switch-over solenoid valve (SV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	(control unit)
C1167	SV2	VDC switch-over solenoid valve (SV2) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CV1
CV2
SV1
SV2

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-211, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-165</u>. "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

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

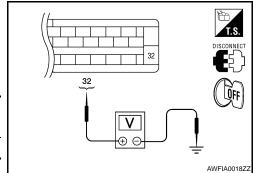
BRC-211

< COMPONENT DIAGNOSIS >

2.check solenoid, vdc switch-over valve and actuator relay power supply circuit

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

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Connector Terminal		voltage	
E125	32	Ground	Battery voltage	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

${f 3.}$ CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACUATOR RELAY GROUND CIRCUIT

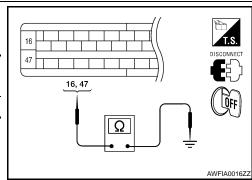
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

ABS actuator and ele	ectric unit (control unit)	_	Continuity	
Connector	Connector Terminal		Continuity	
E125	16, 47	Ground	Yes	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-255</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



INFOID:0000000001675448

Component Inspection

1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- 2. On the display, touch "UP", "KEEP", and "DOWN", and check that the system operates as shown in the table below.

Operation		AE	3S solenoid va	alve	ABS	solenoid valv	e (ACT)
		UP	KEEP	DOWN	UP	ACTUA- TOR UP	ACTUA- TOR KEEP
FR RH SOL	FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH ABS SOLE- NOID (ACT)	FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH SOL	FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH ABS SOLE- NOID (ACT)	FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH SOL	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH ABS SOLE- NOID (ACT)	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH ABS SOLE- NOID (ACT)	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
	RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
REAR SOL	RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
NEAN SOL	RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
	RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

^{*:} ON for 1 to 2 seconds after the touch, and then OFF

C1164, C1165, C1166, C1167 CV/SV SYSTEM

[VDC/TCS/ABS] < COMPONENT DIAGNOSIS > Is the inspection result normal? Α YES >> INSPECTION END NO >> Go to diagnosis procedure. Refer to BRC-211, "Diagnosis Procedure". Special Repair Requirement INFOID:0000000001675449 В 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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION: Description". D >> 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

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C1178, C1181, C1184, C1189 ABS ACTIVE BOOSTER

Description INFOID:000000001537230

The active brake booster consists of a vacuum booster, an active booster control group and a delta stroke sensor. If a brake booster system malfunction occurs due to loss of vacuum, the delta stroke sensor will signal the ABS actuator and electric unit (control unit) that a booster malfunction has occurred. The active booster then applies supplemental force to the master cylinder relative to the amount of force exerted on the brake pedal.

DTC Logic INFOID:000000001537231

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1178	ABS ACTIVE BOOSTER SV NG	Active booster solenoid is malfunctioning, or signal line of active booster servo is open or shorted.	
C1181	ABS ACTIVE BOOSTER RE- SPONSE NG	Active booster response is malfunctioning, or signal line of active booster response is open or shorted.	Harness or connector Active booster
C1184	ABS BRAKE RELEASE SW NG	Brake release switch is malfunctioning, or signal line of brake release switch is open or shorted.	ABS actuator and electric unit (control unit)
C1189	ABS BRAKE BOOSTER DE- FECT	Brake booster is defective or malfunctioning.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ABS ACTIVE BOOSTER SV NG
ABS ACTIVE BOOSTER RESPONSE NG
ABS BRAKE RELEASE SW NG
ABS BRAKE BOOSTER DEFECT

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-214, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001537232

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- Turn the ignition switch OFF.
- Disconnect the active booster connector E49 and ABS actuator and electric unit (control unit) connector E125 and inspect the terminals for deformation, disconnection, looseness, or damage.

<u>Is the inspection result normal?</u>

YES >> GO TO 2

NO >> Repair connector.

2.ACTIVE BOOSTER CIRCUIT INSPECTION

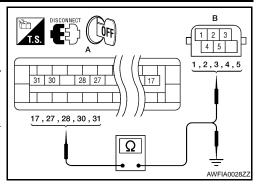
C1178, C1181, C1184, C1189 ABS ACTIVE BOOSTER

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

 Measure the continuity between ABS actuator and electric unit (control unit) harness connector E125 (A) and active booster harness connector E49 (B).

ABS actuator and electric unit (control unit)		Active booster		Continuity
Connector	Terminal	Connector Terminal		
	17		3	
	27		1	
A: E125	28	B: E49	5	Yes
	30		2	
	31		4	



2. Measure the continuity between ABS actuator and electric unit (control unit) harness connector E125 (A) and body ground.

	electric unit (control nit)	_	Continuity	
Connector Terminal				
	17			
	27			
A: E125	28	Ground	No	
	30			
	31			

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

3. ACTIVE BOOSTER INSPECTION

- Reconnect the active booster and ABS actuator and electric unit (control unit) connectors.
- Use "DATA MONITOR" to check if the status of "RELEASE SWITCH NO" and "RELEASE SWITCH NC" is normal.

Condition	RELEASE SWITCH NO (DATA MONITOR)	RELEASE SWITCH NC (DATA MONITOR)
When brake pedal is depressed.	ON	OFF
When brake pedal is released.	OFF	ON

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installation".

NO >> Replace the active booster. Refer to <u>BR-30, "With VDC"</u>.

Component Inspection

1. CHECK DATA MONITOR

Use "DATA MONITOR" to check if the status of "RELEASE SWITCH NO" and "RELEASE SWITCH NC" is normal.

Condition	RELEASE SWITCH NO (DATA MONITOR)	RELEASE SWITCH NC (DATA MONITOR)
When brake pedal is depressed.	ON	OFF
When brake pedal is released.	OFF	ON

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INFOID:0000000001537233

C1178, C1181, C1184, C1189 ABS ACTIVE BOOSTER

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-214</u>, "<u>Diagnosis Procedure</u>".

Special Repair Requirement

INFOID:0000000001675450

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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: 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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1179 ABS DELTA S SEN NG

Description INFOID:0000000001537235

The active brake booster consists of a vacuum booster, an active booster control group and a delta stroke sensor. If a brake booster system malfunction occurs due to loss of vacuum, the delta stroke sensor will signal the ABS actuator and electric unit (control unit) that a booster malfunction has occurred. The active booster then applies supplemental force to the master cylinder relative to the amount of force exerted on the brake pedal.

DTC Logic INFOID:0000000001537236

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1179	ABS DELTA S SEN NG	Delta stroke sensor is malfunctioning, or signal line of delta stroke sensor is open or shorted.	Harness or connector Delta stroke sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
ABS DELTA S SEN NG	

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to BRC-217, "Diagnosis Procedure". YES

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- Turn the ignition switch OFF.
- Disconnect the delta stroke sensor connector E114 and ABS actuator and electric unit (control unit) connector E125 and inspect the terminals for deformation, disconnection, looseness, or damage.

Is the inspection result normal?

YFS >> GO TO 2

NO >> Repair connector.

2. DELTA STROKE SENSOR CIRCUIT INSPECTION

Measure the continuity between ABS actuator and electric unit (control unit) harness connector E125 (A) and delta stroke sensor harness connector E114 (B).

ABS actuator and electric unit (control unit)		Delta stroke sensor		Continuity
Connector	Terminal	Connector	Terminal	
	26		1	
A: E125	39	B: E114	3	Yes
	40		5	

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Measure the continuity between ABS actuator and electric unit (control unit) harness connector E125 (A) and body ground.

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	electric unit (control nit)	_	Continuity	
Connector	Terminal			
	26		_	
A: E125	39	Ground	No	
	40			

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

3.delta stroke sensor inspection

- Reconnect the delta stroke sensor and ABS actuator and electric unit (control unit) connectors.
- 2. Use "DATA MONITOR" to check if the status of "DELTA S SEN" is normal.

Condition	DELTA S SEN (DATA MONITOR)	
When brake pedal is depressed.	1.05–1.80 mm	
When brake pedal is released.	0.00 mm (+0.6/-0.4)	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installation".

NO >> Replace the delta stroke sensor.

Component Inspection

INFOID:0000000001537238

1. CHECK DATA MONITOR

Use "DATA MONITOR" to check if the status of "DELTA S SEN" is normal.

Condition	DELTA S SEN (DATA MONITOR)	
When brake pedal is depressed.	1.05–1.80 mm	
When brake pedal is released.	0.00 mm (+0.6/-0.4)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-217, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000001675451

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-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.calibration of decel ${\sf g}$ sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

[VDC/TCS/ABS]

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U1000 CAN COMM CIRCUIT

Description INFOID:000000001537240

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

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	

Diagnosis Procedure

INFOID:0000000001537242

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check
 the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or
 replace the terminal.
- 2. Reconnect connector and perform self-diagnosis.

Is "CAN COMM CIRCUIT" displayed in self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> Connector terminal is loose, damaged, open, or shorted.

Special Repair Requirement

INFOID:0000000001675452

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-150</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

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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-151, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

VDC OFF SWITCH

Description INFOID:000000001537244

VDC OFF switch can deactivate (turn OFF) the VDC/TCS function by pressing the VDC OFF switch.

Component Function Check

INFOID:0000000001537245

1. CHECK VDC OFF SWITCH OPERATION

Turn ON/OFF the VDC OFF switch and check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly.

Condition	VDC OFF indicator lamp illumination status
VDC OFF switch: ON	ON
VDC OFF switch: OFF	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-220, "Diagnosis Procedure".

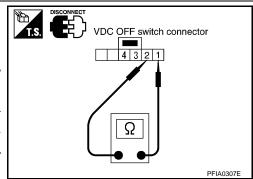
Diagnosis Procedure

INFOID:0000000001537246

1. CHECK VDC OFF SWITCH

- Turn ignition switch OFF.
- 2. Disconnect VDC OFF switch connector.
- 3. Check continuity between VDC OFF switch terminals.

VDC OFF switch	Condition	Continuity
Terminal	Condition	Continuity
1 – 2	When VDC OFF switch is pressed.	Yes
1 – 2	When VDC OFF switch is released.	No



Is the inspection result normal?

YES >> GO TO 2

NO >> Replace VDC OFF switch.

2. CHECK VDC OFF SWITCH HARNESS

- Disconnect ABS actuator and electric unit (control unit) connector.
- Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) and VDC OFF switch connector M148 (B).

ABS actuator and electric unit (control unit)		VDC OF	Continuity	
Connector	Terminal	Connector	Terminal	
A: E125	38	B: M148	1	Yes

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

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ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Connector Terminal		Continuity
A: E125	38	Ground	No

Is the inspection result normal?

YES >> GO TO 3

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NO >> Repair or replace harness.

3.check vdc off switch ground

Check continuity between VDC OFF switch connector M148 and ground.

VDC OFF switch			Continuity	
Connector	Terminal		Continuity	
M148	2	Ground	Yes	

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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-26, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-72, "Removal and Installation".

Component Inspection

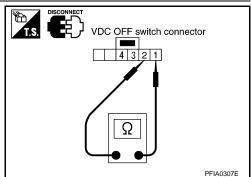
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INSPECTION PROCEDURE

1. CHECK VDC OFF SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect VDC OFF switch connector.
- 3. Check continuity between VDC OFF switch terminals.

VDC OFF switch	Condition	Continuity	
Terminal	Condition	Continuity	
1 – 2	When VDC OFF switch is pressed.	Yes	
1 – 2	When VDC OFF switch is released.	No	



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VDC OFF switch.

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ABS WARNING LAMP

Description INFOID:0000000001537248

 \times : ON -: OFF

Condition	ABS warning lamp
Ignition switch OFF	-
For 1 second after turning ON ignition switch	×
1 second later after turning ON ignition switch	-
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000001537249

1. CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-222, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000001537250

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-165. "CONSULT-III Function (ABS)"</u>.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-26, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-72, "Removal and Installation".

[VDC/TCS/ABS]

BRAKE WARNING LAMP

Description INFOID:000000001537251

×: ON –: OFF

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Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
For 1 second after turning ON ignition switch	× (Note 2)
1 second later after turning ON ignition switch	× (Note 2)
EBD function is malfunctioning.	×

NOTE:

- 1: Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- · 2: After starting engine, brake warning lamp is turned off.

1.BRAKE WARNING LAMP OPERATION CHECK

Component Function Check

INFOID:0000000001537252

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-223, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000001537253

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-165</u>, "CONSULT-III Function (ABS)".

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-26, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-72, "Removal and Installation".

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VDC OFF INDICATOR LAMP

Description INFOID:000000001537254

×: ON -: OFF

Condition	VDC OFF indicator lamp
Ignition switch OFF	-
For 1 second after turning ON ignition switch	×
1 second later after turning ON ignition switch	-
VDC OFF switch turned ON. (VDC function is OFF.)	×
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000001537255

1.VDC OFF INDICATOR LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2

NO >> Go to diagnosis procedure. Refer to BRC-224, "Diagnosis Procedure".

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check VDC OFF switch. Refer to BRC-220, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000001537256

1. CHECK VDC OFF SWITCH

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check VDC OFF switch. Refer to BRC-220, "Diagnosis Procedure".

CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-165</u>, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 3

NO >> Check items displayed by self-diagnosis.

3. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-26, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-72, "Removal and Installation".

[VDC/TCS/ABS]

SLIP INDICATOR LAMP

Description INFOID:000000001537257

×: ON –: OFF

Condition	SLIP indicator lamp
Ignition switch OFF	-
For 1 second after turning ON ignition switch	×
1 second later after turning ON ignition switch	-
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000001537258

1. CHECK SLIP INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-225, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000001537259

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-165</u>, "CONSULT-III Function (ABS)".

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-26, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-255, "Removal and Installation".</u>

NO >> Replace combination meter. Refer to MWI-72, "Removal and Installation".

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< ECU DIAGNOSIS > [VDC/TCS/ABS]

ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

CONSULT-III MONITOR ITEM

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
		0 [km/h (MPH)]	Vehicle stopped	
FR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
FR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
RR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
CTOD LAMB CW	Cton lown quitab simple status	When brake pedal is depressed	ON	
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is released	OFF	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5	
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D	
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON	
OFF SW		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF	
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G	When vehicle is stopped	Approx. 0 d/s	
IAW KAIE SEN	sensor	When vehicle turning	-75 to 75 d/s	
ACCEL DOS SIG	Throttle actuator opening/closing is displayed (linked with accelerator pedal)	Accelerator pedal not depressed (ignition switch is ON)	0 %	
ACCEL POS SIG		Accelerator pedal depressed (ignition switch is ON)	0 - 100 %	

< ECU DIAGNOSIS > [VDC/TCS/ABS]

ECU DIAGNOS	510 /		[VD0/T00/AB0]	
		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
		Vehicle stopped	Approx. 0 m/s ²	
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle turning right	Negative value (m/s ²)	
		Vehicle turning left	Positive value (m/s ²)	
STR ANGLE SIG	Steering angle detected by steering angle	Straight-ahead	Approx. 0°	
OTR ANGLE SIG	sensor	Steering wheel turned	–720 to 720°	
PRESS SENSOR	Brake fluid pressure detected by front pres-	With ignition switch turned ON and brake pedal released	Approx. 0 bar	
PRESS SENSOR	sure sensor	With ignition switch turned ON and brake pedal depressed	-40 to 300 bar	
		With engine stopped	0 rpm	
ENGINE SPEED	With engine running	Engine running	Almost in accor- dance with tachome- ter display	
	Dealer florid level evidely since leading	When brake fluid level switch ON	ON	
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch OFF	OFF	
FR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
FR RH OUT SOL Operation status of each sole	Operation status of each calculated value	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
FR LH IN SOL	Operation status of each calenaid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR LH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
ED LU QUE SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR LH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
RR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	

< ECU DIAGNOSIS > [VDC/TCS/ABS]

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
RR RH OUT SOL		Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
KK KH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
RR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
KK EITIN 30E	Operation status of each solehold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
RR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
KK EITOOT SOE	Operation status of each solehold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON	
MOTOR RELAY		When the motor relay and motor are not operating	OFF	
A OTHATOD DIV	A. d.	When the actuator relay is operating	ON	
ACTUATOR RLY	Actuator relay operation	When the actuator relay is not operating	OFF	
ADC WADALLAMD	ABS warning lamp	When ABS warning lamp is ON	ON	
ABS WARN LAMP	(Note 3)	When ABS warning lamp is OFF	OFF	
OFFIAMD	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	ON	
OFF LAMP	(Note 3)	When VDC OFF indicator lamp is OFF	OFF	
CLID LAMD	SLIP indicator lamp	When SLIP indicator lamp is ON	ON	
SLIP LAMP	(Note 3)	When SLIP indicator lamp is OFF	OFF	
4WD FAIL REQ	Transfer control unit fail-safe signal	When transfer control unit is in fail-safe mode	ON	
(Note 2)	Transfer common arm tan care engine.	When transfer control unit is normal	OFF	
BST OPER SIG	Active bagger appretion	Active booster is active	ON	
BST OPER SIG	Active booster operation	Active booster is inactive	OFF	
EBD SIGNAL	EBD operation	EBD is active	ON	
EBD SIGNAL	EBD operation	EBD is inactive	OFF	
ABS SIGNAL	ABS operation	ABS is active	ON	
ABS SIGNAL	Abs operation	ABS is inactive	OFF	
TCS SIGNAL	TCS operation	TCS is active	ON	
	TCS operation	TCS is inactive	OFF	
VDC SIGNAL	VDC operation	VDC is active	ON	
V DO GIGINAL	VDC operation	VDC is inactive	OFF	
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	ON	
	222 Idii Saio Sigriai	EBD is normal	OFF	
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	ON	
, .20 i / ii 2 0i 0	, 150 fall ballo digital	ABS is normal	OFF	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
OSIS > [VDC/TCS/ABS] < ECU DIAGNOSIS >

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
TCS FAIL SIG	TCS fail cofe signal	In TCS fail-safe	ON
ICS FAIL SIG	TCS fail-safe signal	TCS is normal	OFF
/DC FAIL CIC	VDC fail acts signal	In VDC fail-safe	ON
/DC FAIL SIG	VDC fail-safe signal	VDC is normal	OFF
CRANKING SIG	Crank aparation	Crank is active	ON
CRAINKING SIG	Crank operation	Crank is inactive	OFF
CV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
CV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
DECEL G-SEN	Longitudinal acceleration detected by Decel	Vehicle stopped	Approx. 0 G
	G-Sensor	Vehicle running	-1.7 to 1.7 G
BD WARN LAMP	EBD warning lamp	When EBD warning lamp is ON	ON
	(Note 3)	When EBD warning lamp is OFF	OFF
POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = N position	ON
		A/T shift position = other than N position	OFF
POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = P position	ON
	1 14. Switch Signal OlyOf 1 Collution	A/T shift position = other than P position	OFF
POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = R position	ON
	1 14. Switch Signal Olivor i Condition	A/T shift position = other than R position	OFF
WD/4WD	Drive axle	2WD model	2WD
v v <i>∪/</i> + v V <i>U</i>	DIIVE AXIC	4WD model	4WD
PRESS SEN2	Brake fluid pressure detected by rear pres-	With ignition switch turned ON and brake pedal released	Approx. 0 bar
PRESS SEN2	sure sensor	With ignition switch turned ON and brake pedal depressed	–40 to 300 bar

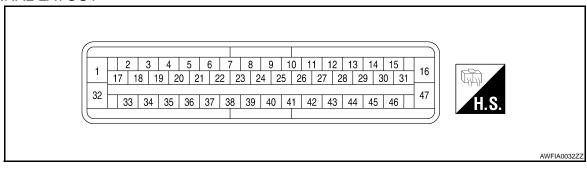
< ECU DIAGNOSIS > [VDC/TCS/ABS]

	Display content	Data monitor		
Monitor item		Condition	Reference value in normal operation	
DELTA S SEN	Value detected by delta stroke sensor	When brake pedal is depressed	1.05 - 1.80 mm	
DELIA 3 SEN	value detected by delta stroke serisor	When brake pedal is released	0.00 mm (+0.6/-0.4)	
RELEASE SWITCH	Active begater signal status	When brake pedal is depressed	ON	
NO	Active booster signal status	When brake pedal is released	OFF	
RELEASE SWITCH Active booster sign	Active begater signal status	When brake pedal is depressed	OFF	
	Active booster signal status	When brake pedal is released	ON	
CTD OFF DLV	Stop lamp relay signal	When stop lamp relay is ON	ON	
STP OFF RLY		When stop lamp relay is OFF	OFF	
PRES CTRL ACC	This item is not used for this model.	_	_	
PRES FAIL ACC	This item is not used for this model.	_	_	

NOTE:

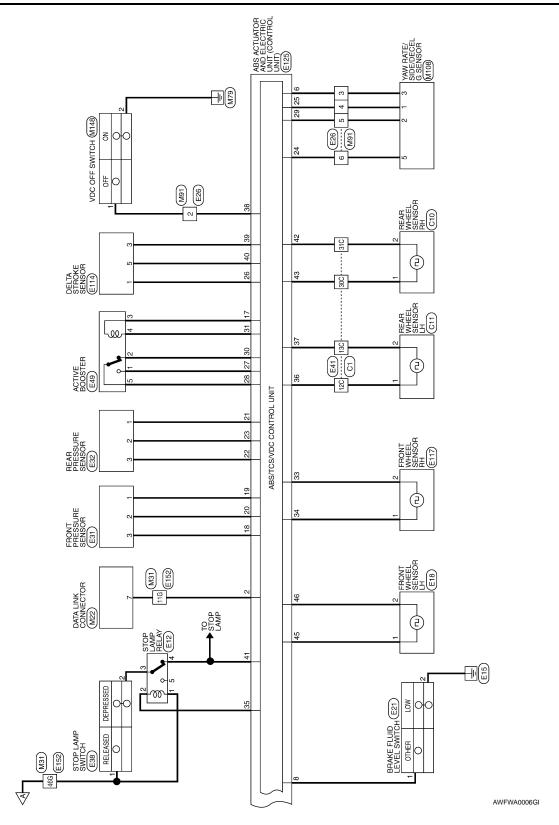
- 1: Confirm tire pressure is normal.
- 2: Only 4WD models.
- 3: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-222, "Description".
- Brake warning lamp: Refer to BRC-223, "Description".
- VDC OFF indicator lamp: Refer to BRC-224, "Description".
- SLIP indicator lamp: Refer to BRC-225, "Description".

TERMINAL LAYOUT

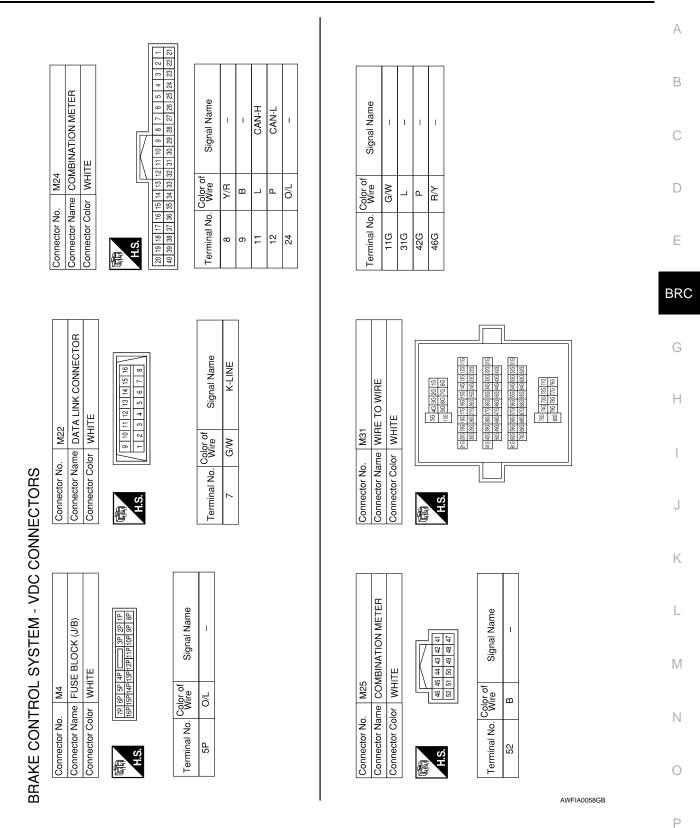


[VDC/TCS/ABS] < ECU DIAGNOSIS > Wiring Diagram INFOID:0000000001537261 Α ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) ■ : DATA LINE В C D DATA LINE Е M31 E152 EZ6 M91 BRC 10A COMBINATION METER (M24), (M25) G BRL BIN BUT Susv1 (MC1) ABS/TCS/VDC CONTROL UNIT Н VDC BRAKE UNIFIED METER CONTROL UNIT (WITH INFORMATION DISPLAY) SHSV1 SUSV2 (MC1) S(MC2) Sent Sar (M60 ABS (*) SLIP FUSE BLOCK (J/B) (M4), (M39), (HSV2 (MC2) J Ę Ę≅ IGNITION SWITCH ON OR START Per J 10A K لچ 10A BRAKE CONTROL SYSTEM - VDC L 10A M 30A H Ν MOTOR **₽** BATTERY 0

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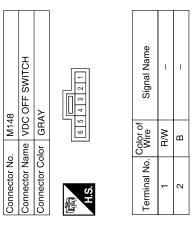
< ECU DIAGNOSIS > [VDC/TCS/ABS]

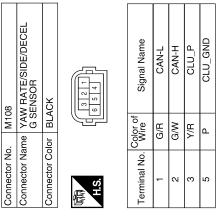


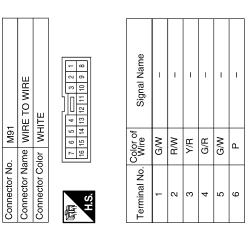
[VDC/TCS/ABS] < ECU DIAGNOSIS >

	Connector Name FUSE BLOCK (J/B)	11	27	Signal Name	
M60	ne FUS	or WHI	271	Color of Wire	2
Connector No.	Connector Nan	Connector Color WHITE	H.S.	Terminal No. Wire	ţ
	JGLE SENSOR			.I Name	GND

Connector No. M60 Connector Name FUSE BLOCK (J/B) Connector Color WHITE	27	Color of Signal Name	R/Y			
Connector No. M60 Connector Name FUSE B Connector Color WHITE	(中)	Color of Terminal No. Wire	11			
Connector No. M47 Connector Name STEERING ANGLE SENSOR Connector Color WHITE	4 1 1 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	of Signal Name	GND	POWER	CAN-H	CAN-L
Connector No. M47 Connector Name STEERI Connector Color WHITE	明.S.	Terminal No. Wire	2 B	3 G/W	4 L	5 P
Connector No. M39 Connector Name FUSE BLOCK (J/B) Connector Color WHITE	30 20 10 80 70 80 74	or of Signal Name	Y/R –			
Connector No. M39 Connector Name FUS Connector Color WHI	原 H.S.	Terminal No. Wire	4Q Y/			







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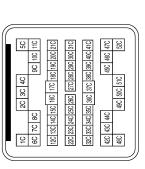
< ECU DIAGNOSIS > [VDC/TCS/ABS]

	А
E21 SWITCH GRAY GRAY Tree Signal Name S	В
	D
Connector No. 3 w w 3 w w 3 w w	Е
	BRC
FRONT WHEEL SENSOR LH GRAY Tof Signal Name SE31 FRONT PRESSURE SENSOR GRAY GRAY GRA GRA	G H
	I
Connector No. Connec	J
	К
Connector No. E12 Connector Name STOP LAMP RELAY Connector Color BLACK 1	L
Color of Wire Color of Wir	N
Connector No. Connector Color Terminal No. Connector Name Connector Name Connector Name Connector Name Connector No. Conne	0
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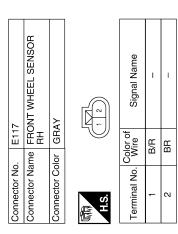
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[VDC/TCS/ABS] < ECU DIAGNOSIS >

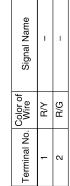




Signal Name	I	1	1	ı	
Color of Wire	Т	Ь	G/Y	>	
Terminal No.	12C	13C	30C	31C	



or re	Old software	007
Connector Name STOP LAMP SWITCH (COLUMN SHIFT) Connector Color WHITE	COLLINECTOL INO.	E38
(COLUMN SHIFT) Connector Color WHITE	Connector Name	STOP LAMP SWITCH
Connector Color WHITE		(COLUMN SHIFT)
	Connector Color	WHITE



Signal Name	ı	ı	
Wire	R/Y	R/G	
Terminal No.	-	2	

4	Connector Name DELTA STROKE SENSOR	CK	1 2 3	Signal Name	BELS_PWR	DELS_GND	DIS ⁻ SI30
E114	ne DEI	or BLACK		Color of Wire	N/M	G/B	R/Υ
Connector No.	Connector Nar	Connector Color	画 H.S.	Terminal No.	1	3	5

E38	Connector Name STOP LAMP SWITCH (FLOOR SHIFT)	BLACK	
Connector No.	Connector Name	Connector Color BLACK	



3 4

Signal Name	ı	_
Color of Wire	R/Υ	R/G
Terminal No.	-	2

	ACTIVE BOOSTER	CK		3 2 1	4 2 4	Signal Name	I	-	-	-
E49		or BLACK		ري	7	Color of Wire	L/B	LG/R	W/R	M/G
Connector No.	Connector Name	Connector Color	Í	E	H.S.	Terminal No.	-	7	ε	4

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< ECU DIAGNOSIS > [VDC/TCS/ABS]

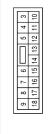
Signal Name	PS1 - GND	PS1_SIGNAL	PS2_GND	PS2_SUPPLY	PS2_SIGNAL	CLUSTER_GND	CAN2_L	DEL_S_SUPPLY	BST_NO	BST_SIG	CAN2_H	BST_NC	BST_GND	VALVE_ECU_SUPPLY	WSS_FR_SIG	WSS_FR_PWR	BRL_OUT	WSS_RL_PWR	WSS_RL_SIG	WS_34O_0dV	DEL_S_GND	DEL_S_SIGNAL	BLS	WSS_RR_SIG	WSS_RR_PWR	WSS_FL_PWR	WSS_FL_SIG	CIND DOTOM
Color of Wire	SB	B/L	B/B	T/M	O/M	Ь	G/R	N/M	Π/B	A//B	G/W	LG/R	W/G	B/Y	BR	H/B	MΠ	٦	Ь	M/H	g/b	√,H	R/B	^	G/Y	0/9	BR/W	В
Terminal No.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	45	46	47

25	Connector Name ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	ACK	
Connector No. E125	Connector Name AB ELI UN	Connector Color BLACK	



Signal Name	MOTOR_SUPPLY	DIAG_K	NSI	CLUSTER_SUPPLY	FLUID_LEVEL_SW	CAN-H	CAN-L	VALVE_ECU_GND	BST_SUPPLY	PS1 - SUPPLY
Color of Wire	\	>	LG/B	Y/R	P/B	٦	Ь	В	W/R	LG
Terminal No.	-	2	4	9	8	11	15	16	17	18

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



Wire LG/B A		color of	
LG/B	Terminal No.	Wire	Signal Name
H(5/B	ļ	9	
	15	LG/B	ABS IGN SUP

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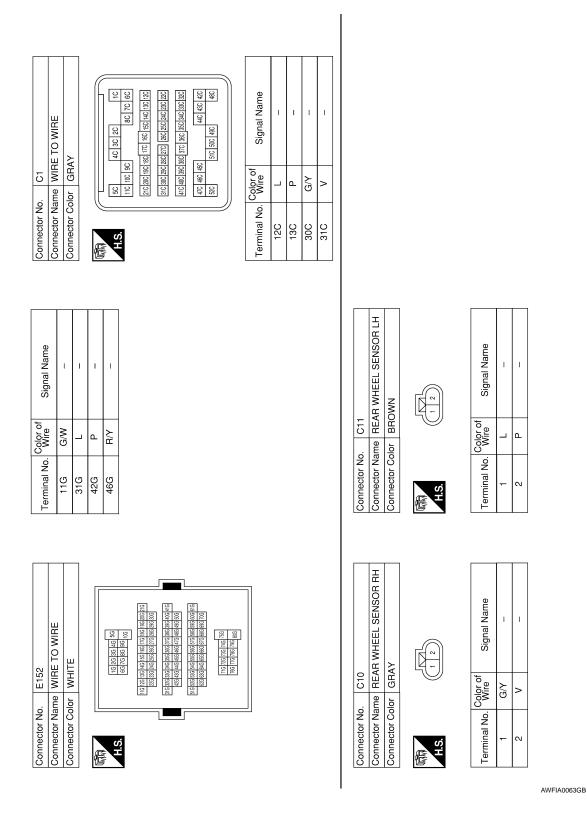
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< ECU DIAGNOSIS > [VDC/TCS/ABS]



Fail-Safe

CAUTION:

If the Fail-Safe function is activated, perform Self Diagnosis for ABS/TCS/VDC system.

ABS/EBD SYSTEM

< ECU DIAGNOSIS > [VDC/TCS/ABS]

In case of an electrical malfunction with the ABS, the ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. In case of an electrical malfunction with the EBD system, the BRAKE warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on.

The system will revert to one of the following conditions of the Fail-Safe function.

- For ABS malfunction, only the EBD is operative and the condition of the vehicle is the same condition of vehicles without ABS/TCS/VDC system.
- For EBD malfunction, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without ABS/TCS/VDC or EBD system.

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VDC/TCS SYSTEM

In case of TCS/VDC system malfunction, the VDC OFF indicator lamp and SLIP indicator lamp are turned on and the condition of the vehicle is the same as the condition of vehicles without TCS/VDC system. In case of an electrical malfunction with the TCS/VDC system, the ABS control continues to operate normally without TCS/VDC control.

DTC No. Index

се	Reference	Items (CONSULT screen terms)	DTC
		RR RH SENSOR-1	C1101
eription"	PPC 170 "Description"	RR LH SENSOR-1	C1102
Сприоп	BRC-170, "Description"	FR RH SENSOR-1	C1103
		FR LH SENSOR-1	C1104
		RR RH SENSOR-2	C1105
eription"	BRC-173, "Description"	RR LH SENSOR-2	C1106
Сприоп		FR RH SENSOR-2	C1107
		FR LH SENSOR-2	C1108
cription"	BRC-176, "Description"	BATTERY VOLTAGE [ABNORMAL]	C1109
C Logic"	BRC-178, "DTC Logic"	CONTROLLER FAILURE	C1110
cription"	BRC-179, "Description"	PUMP MOTOR	C1111
cription"	BRC-181, "Description"	G-SENSOR	C1113
cription"	BRC-184, "Description"	ABS SENSOR [ABNORMAL SIGNAL]	C1115
cription"	BRC-187, "Description"	STOP LAMP SW	C1116
cription"	BRC-189, "Description"	FR LH IN ABS SOL	C1120
cription"	BRC-192, "Description"	FR LH OUT ABS SOL	C1121
cription"	BRC-189, "Description"	FR RH IN ABS SOL	C1122
cription"	BRC-192, "Description"	FR RH OUT ABS SOL	C1123
cription"	BRC-189, "Description"	RR LH IN ABS SOL	C1124
cription"	BRC-192, "Description"	RR LH OUT ABS SOL	C1125
cription"	BRC-189, "Description"	RR RH IN ABS SOL	C1126
cription"	BRC-192, "Description"	RR RH OUT ABS SOL	C1127
		ENGINE SIGNAL 1	C1130
		ENGINE SIGNAL 2	C1131
cription"	BRC-195, "Description"	ENGINE SIGNAL 3	C1132
		ENGINE SIGNAL 4	C1133
		ENGINE SIGNAL 6	C1136
cription"	BRC-197, "Description"	ACTUATOR RLY	C1140
cription"	BRC-199, "Description"	PRESS SEN CIRCUIT	C1142
	DDC 000 IIDi-tiII	ST ANG SEN CIRCUIT	C1143
<u>cription"</u>	BRC-202, "Description"	ST ANG SEN SIGNAL	C1144

< ECU DIAGNOSIS > [VDC/TCS/ABS]

DTC	Items (CONSULT screen terms)	Reference	
C1145	YAW RATE SENSOR		
C1146	SIDE G-SEN CIRCUIT	BRC-181, "Description"	
C1155	BR FLUID LEVEL LOW	BRC-205, "Description"	
C1156	ST ANG SEN COM CIR	BRC-208, "Description"	
C1160	DECEL G SEN SET	BRC-209, "Description"	
C1163	ST ANGL SEN SAFE	BRC-210, "Description"	
C1164	CV1		
C1165	CV2	DD0 044 D	
C1166	SV1	BRC-211, "Description"	
C1167	SV2		
C1170	VARIANT CODING	BRC-178, "DTC Logic"	
C1178	ABS ACTIVE BOOSTER SV NG	BRC-214, "Description"	
C1179	ABS DELTA S SEN NG	BRC-217, "Description"	
C1181	ABS ACTIVE BOOSTER RESPONSE NG		
C1184	ABS BRAKE RELEASE SW NG	BRC-214, "Description"	
C1189	ABS BRAKE BOOSTER DEFECT		
U1000	CAN COMM CIRCUIT	BRC-219, "Description"	

[VDC/TCS/ABS]

SYMPTOM DIAGNOSIS

VDC/TCS/ABS

Symptom Table

INFOID:0000000001537264

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

Symptom	Check item	Reference
	Brake force distribution	
Excessive ABS function operation frequency	Looseness of front and rear axle	BRC-242, "Diag- nosis Procedure"
4406)	Wheel sensor and rotor system	
Unavacated nodel reaction	Brake pedal stroke	BRC-243, "Diag-
Unexpected pedal reaction	Make sure the braking force is sufficient when the ABS is not operating.	nosis Procedure"
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-244, "Diag- nosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-245, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-246, "Diag-
occurs (Note 2)	ABS actuator and electric unit (control unit)	nosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS con- trol	ТСМ	BRC-247, "Diag- nosis Procedure"
	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. However, this is normal.
- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [at 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 ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:0000000001537265

1. CHECK START

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

Is the inspection result normal?

YES >> GO TO 2

NO >> Check brake system.

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles. Refer to front: <u>FAX-5</u>, "<u>On-Vehicle Inspection and Service</u>", Rear: <u>RAX-5</u>, "<u>On-Vehicle Inspection</u>".

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following.

- · Wheel sensor installation for damage.
- · Sensor rotor installation for damage.
- Wheel sensor connector connection.
- · Wheel sensor harness inspection.

Is the inspection result normal?

YES >> GO TO 4

NO >> • Replace wheel sensor or sensor rotor. Refer to <u>BRC-253</u>, "Removal and Installation".

· Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

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

YES >> Perform self-diagnosis. Refer to <u>BRC-165</u>, "CONSULT-III Function (ABS)".

NO >> Normal

UNEXPECTED PEDAL REACTION

[VDC/TCS/ABS] < SYMPTOM DIAGNOSIS > UNEXPECTED PEDAL REACTION Α Diagnosis Procedure INFOID:0000000001537266 1. CHECK BRAKE PEDAL STROKE В Check brake pedal stroke. Refer to BR-14, "Inspection and Adjustment". Is the stroke too large? C YES >> • Bleed air from brake tube and hose. Refer to BR-16, "Bleeding Brake System". · Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to BR-14, "Inspection and Adjustment" (brake pedal), BR-26, "With ABLS or VDC" (master cylinder), BR-28, "On-Vehicle Service" (brake booster). D NO >> GO TO 2 2. CHECK FUNCTION Е Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. Check if braking force is

Is the inspection result normal?

normal in this condition. Connect connector after inspection.

YES >> Normal

NO >> Check brake system.

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THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000001537267

CAUTION:

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

1. CHECK FUNCTION

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

[VDC/TCS/ABS] < SYMPTOM DIAGNOSIS > ABS FUNCTION DOES NOT OPERATE Α Diagnosis Procedure INFOID:0000000001537268 **CAUTION:** В ABS does not operate when speed is 10 km/h (6 MPH) or lower. 1. CHECK ABS WARNING LAMP DISPLAY C Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving. Is the inspection result normal? YES >> Normal D >> Perform self-diagnosis. Refer to BRC-165, "CONSULT-III Function (ABS)". NO

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PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000001537269

CAUTION:

Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal.

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

1.SYMPTOM CHECK 1

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

Do vibrations occur?

YES >> GO TO 2

NO >> Inspect the brake pedal.

2.SYMPTOM CHECK 2

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

Do the operation noises occur?

YES >> GO TO 3

NO >> Perform self -diagnosis. Refer to BRC-165, "CONSULT-III Function (ABS)".

3.symptom check 3

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

Do symptoms occur?

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

NO >> Normal

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

[VDC/TCS/ABS] < SYMPTOM DIAGNOSIS > VEHICLE JERKS DURING VDC/TCS/ABS CONTROL Α Diagnosis Procedure INFOID:0000000001537270 1.SYMPTOM CHECK В Check if the vehicle jerks during VDC/TCS/ABS control. Is the inspection result normal? YES >> Normal. NO >> GO TO 2 2.CHECK SELF-DIAGNOSIS RESULTS D Perform self-diagnosis of ABS actuator and electric unit (control unit). Refer to BRC-165, "CONSULT-III Function (ABS)". Are self-diagnosis results indicated? Е >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis. NO >> GO TO 3 BRC 3. CHECK CONNECTOR Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector and check terminal for deformation, disconnection, looseness, etc. Securely connect connectors and perform ABS actuator and electric unit (control unit) self-diagnosis. Are self-diagnosis results indicated? Н YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. NO >> GO TO 4 f 4 .CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS Perform ECM and TCM self-diagnosis. Are self-diagnosis results indicated? YES >> Check the corresponding items. • ECM: Refer to EC-67, "CONSULT-III Function (ENGINE)". TCM: Refer to TM-34, "CONSULT-III Function (TRANSMISSION)". NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-255, "Removal and Installa-K tion". L M N Р

[VDC/TCS/ABS]

NORMAL OPERATING CONDITION

Description INFOID:000000001537271

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.		
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	This is a normal condition due to the VDC, TCS or ABS activation.	
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.		
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.	
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because	
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).	
The ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.	In this case, restart the engine on a normal	
VDC may not operate normally or the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp may illuminate, when running on a special road that is extremely slanted (e.g. bank in a circuit course).	road. If the normal con- dition is restored, there is no malfunction. At	
A malfunction may occur in the yaw rate/side/decel G sensor system, when the vehicle turns sharply, such as during a spin turn, axle turn, or drift driving, while the VDC function is off (VDC OFF indicator lamp illuminated).	that time, erase the self- diagnosis memory.	
The vehicle speed will not increase even though the accelerator pedal is depressed, when inspecting the speedometer on a 2-wheel chassis dynamometer.	Normal (Deactivate the VDC/TCS function before performing an inspection on a chassis dynamometer.)	
VDC OFF indicator lamp and SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a VDC system error but results from characteristic change of tire.	

< PRECAUTION > [VDC/TCS/ABS]

PRECAUTION

PRECAUTIONS

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

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

WARNING:

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

Precaution for Brake System

CAUTION:

- Always use recommended brake fluid. Refer to MA-10, "Fluids and Lubricants".
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- If a brake fluid leak is found, the part must be disassembled without fail. Then it has to be replaced with a new one if a defect exists.
- Turn the ignition switch OFF and remove the connector of the ABS actuator and electric unit (control unit) or the battery terminal before performing the work.
- Always torque brake lines when installing.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

Refer to <u>BR-35</u>, "<u>Brake Burnishing Procedure</u>" (front disc brake) or <u>BR-40</u>, "<u>Removal and Installation of Brake Pad</u>" (rear disc brake).

WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precaution for Brake Control

- During ABS operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is normal.
- Just after starting vehicle, the brake pedal may vibrate or a motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

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Commercial service tool

< PRECAUTION > [VDC/TCS/ABS]

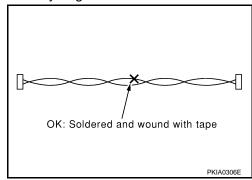
• When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnosis. Besides electrical system inspection, check booster operation, brake fluid level, and fluid leaks.

- If incorrect tire sizes or types are installed on the vehicle or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna or related wiring near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits or improper wiring.
- If the following components are replaced with non-genuine components or modified, the VDC OFF indicator lamp and SLIP indicator lamp may turn on or the VDC system may not operate properly. Components related to suspension (shock absorbers, struts, springs, bushings, etc.), tires, wheels (exclude specified size), components related to brake system (pads, rotors, calipers, etc.), components related to engine (muffler, ECM, etc.), components related to body reinforcement (roll bar, tower bar, etc.).
- Driving with broken or excessively worn suspension components, tires or brake system components may cause the VDC OFF indicator lamp and the SLIP indicator lamp to turn on, and the VDC system may not operate properly.
- When the TCS or VDC is activated by sudden acceleration or sudden turn, some noise may occur. The noise is a result of the normal operation of the TCS and VDC.
- When driving on roads which have extreme slopes (such as mountainous roads) or high banks (such as sharp curves on a freeway), the VDC may not operate normally, or the VDC warning lamp and the SLIP indicator lamp may turn on. This is not a problem if normal operation can be resumed after restarting the engine.
- Sudden turns (such as spin turns, acceleration turns), drifting, etc. with VDC turned off may cause the yaw rate/side/decel G sensor to indicate a problem. This is not a problem if normal operation can be resumed after restarting the engine.

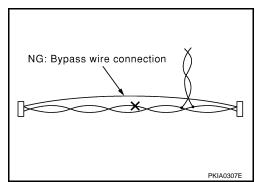
Precaution for CAN System

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- Do not apply voltage of 7.0V or higher to terminal to be measured.
- Maximum open terminal voltage of tester in use must be less than 7.0V.
- Before checking harnesses, turn ignition switch OFF and disconnect battery negative cable.
- Area to be repaired must be soldered and wrapped with tape.
 Make sure that fraying of twisted wire is within 110 mm (4.33 in).



 Do not make a bypass connection to repaired area. (If the circuit is bypassed, characteristics of twisted wire will be lost.)



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PREPARATION

PREPARATION

Special Service Tool

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

Tool number (Kent-Moore No.) Tool name		Description
KV991J0080 (J-45741) ABS active wheel sensor tester	J-43741-BCX OPPONSE SERVICES WETAO101E	Checking operation of ABS active wheel sensors
ST30031000	₩FIA0101E	Removing sensor rotor
(—) Bearing puller		
	ZZA0700D	
ST30720000 (J-25405) Drift		Installing rear sensor rotor a: 77 mm (0.03 in) dia. b: 55 mm (2.17 in) dia.
	a b	
ST27863000	ZZA0701D	Installing rear sensor rotor
(—) Drift	a b b	a: 75 mm (2.95 in) dia. b: 62 mm (2.44 in) dia.
	ZZA0832D	
KV40104710 (—) Drift	a — a — b — b	Installing rear sensor rotor a: 76 mm (2.99 in) dia. b: 68.5 mm (2.697 in) dia.
	ZZA0832D	

< PREPARATION > [VDC/TCS/ABS]

Commercial Service Tool

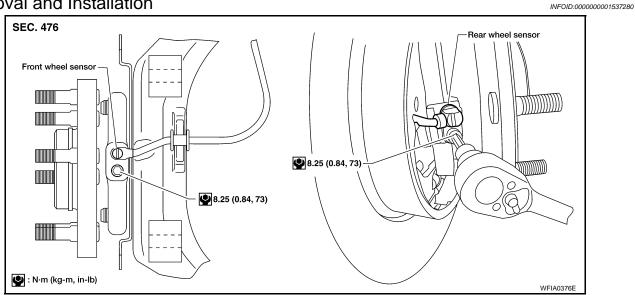
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Tool name		Description
Flare nut crowfoot Torque wrench		Removing and installing brake piping a: 10 mm (0.39 in)/12 mm (0.47 in)
	S-NT360	

REMOVAL AND INSTALLATION

WHEEL SENSORS

Removal and Installation



REMOVAL

- Remove wheel sensor bolt.
 - When removing the front wheel sensor, first remove the disc rotor to gain access to the front wheel sensor bolt. Refer to <u>BR-34</u>, "Removal and Installation of Brake Caliper and Disc Rotor".
- 2. Pull out the sensor, being careful to turn it as little as possible.

CAUTION:

- Do not pull on the sensor harness.
- 3. Disconnect wheel sensor harness electrical connector, then remove harness from attaching points.

INSTALLATION

Installation is in the reverse order of removal. Tighten wheel sensor bolt to specification. **CAUTION:**

Installation should be performed while paying attention to the following.

- Inspect wheel sensor O-ring, replace sensor assembly if damaged.
- Before installing wheel sensor, make sure no foreign materials (such as iron fragments) are adhered to the pick-up part of the sensor, to the inside of the sensor hole or on the rotor mating surface.
- Apply a coat of suitable grease to the wheel sensor O-ring and hole. Refer to GI-15.

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SENSOR ROTOR

< REMOVAL AND INSTALLATION >

[VDC/TCS/ABS]

SENSOR ROTOR

Removal and Installation

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NOTE:

The front wheel sensor rotors are built into the wheel hubs and are not removable. If damaged, replace wheel hub and bearing assembly. Refer to <u>FAX-6</u>, "Removal and Installation". Remove the rear axle refer to <u>RAX-8</u>, "Removal and Installation".

[VDC/TCS/ABS]

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ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation

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- To left front
- To front right
- 7. ABS actuator and electric unit (con- 8. trol unit)
- 2. To rear right
- From the master cylinder secondary 6.
 - Harness connector
- 3. To rear left
 - From the master cylinder primary

REMOVAL

- 1. Disconnect the negative battery terminal.
- 2. Remove the cowl top extension. Refer to EXT-19, "Removal and Installation".
- 3. Drain the brake fluid. Refer to BR-16, "Drain and Refill".
- 4. Disconnect the actuator harness from the ABS actuator and electric unit (control unit). **CAUTION:**
 - To remove the brake tubes, use a flare nut wrench to prevent the flare nuts and brake tubes from being damaged.
 - · Be careful not to splash brake fluid on painted areas.
- Disconnect the brake tubes.
- Remove the three bolts and remove the ABS actuator and electric unit (control unit).

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

To install, use a flare nut wrench (commercial service tool).

- Always tighten brake tubes to specification when installing. Refer to BR-12, "Hydraulic Circuit".
- Never reuse drained brake fluid.

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ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< REMOVAL AND INSTALLATION >

[VDC/TCS/ABS]

- After installation of the ABS actuator and electric unit (control unit), perform the following.
- Refill brake system with new brake fluid. Then bleed the air from the system. Refer to <u>BR-16</u>, "<u>Bleed-ing Brake System</u>".
- Adjust the steering angle sensor. Refer to <u>BRC-150</u>, "<u>ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Description"</u>.
- Calibrate the decel G sensor. Refer to <u>BRC-151</u>, "CALIBRATION OF <u>DECEL G SENSOR</u>: <u>Description"</u>.

STEERING ANGLE SENSOR

< REMOVAL AND INSTALLATION >

[VDC/TCS/ABS]

STEERING ANGLE SENSOR

Removal and Installation

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The steering angle sensor is an integral part of the spiral cable. Refer to <u>SR-6, "Removal and Installation"</u>. **CAUTION:**

After installation of spiral cable, adjust steering angle sensor. Refer to <u>BRC-150, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description"</u>.

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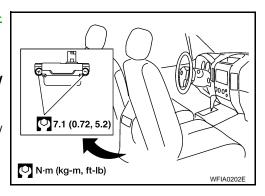
G SENSOR

Removal and Installation

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REMOVAL

- Remove center console. Refer to <u>IP-18, "Removal and Installation".</u>
- 2. Remove yaw rate/side/decel G sensor attaching nuts. **CAUTION:**
 - Do not use power tools to remove or install yaw rate/side/ decel G sensor.
 - Do not drop or strike the yaw rate/side/decel G sensor.
- 3. Disconnect harness connector and remove the yaw rate/side/ decel G sensor.



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not drop or strike the yaw rate/side/decel G sensor.
- After installation, calibrate the yaw rate/side/decel G sensor. Refer to <u>BRC-151</u>, "CALIBRATION OF <u>DECEL G SENSOR</u>: <u>Description</u>".