SECTION BRAKE CONTROL SYSTEM

А

В

С

D

Е

CONTENTS

ABS

BASIC INSPECTION6
DIAGNOSIS AND REPAIR WORKFLOW
FUNCTION DIAGNOSIS9
ABS9System Diagram9System Description9Component Parts Location11Component Description12CONSULT-III Function (ABS)12
COMPONENT DIAGNOSIS16
C1101, C1102, C1103, C1104 WHEEL SEN- SOR-1 16 Description 16 DTC Logic 16 Diagnosis Procedure 16 Component Inspection 18 C1105, C1106, C1107, C1108 WHEEL SEN- 19 Description 19 DTC Logic 19 DTC Logic 19 DTC Logic 19 DTC Logic 19 Diagnosis Procedure 19
Component Inspection21
DTC C1109 BATTERY VOLTAGE [ABNOR- MAL]
DTC Logic

DTC C1111 PUMP MOTOR	BR(
DTC C1114 MAIN RELAY	H
DTC C1115 ABS SENSOR [ABNORMAL SIG- NAL]	J
C1120, C1122, C1124, C1126 IN ABS SOL32 Description	L
C1121, C1123, C1125, C1127 OUT ABS SOL34 Description	N
U1000 CAN COMM CIRCUIT	O P
ABS WARNING LAMP	

BRAKE WARNING LAMP38

Description	38
Component Function Check	38
Diagnosis Procedure	
•	

ECU DIAGNOSIS 39

ABS ACTUATOR AND ELECTRIC UNIT

(CONTROL UNIT)	
Reference Value	
Wiring Diagram - Coupe	
Wiring Diagram - Sedan	46
Fail-Safe	50
DTC No. Index	51

SYMPTOM DIAGNOSIS53

ABS				 	 	 	 	 . 53
Syn	nptor	n Ta	able	 	 	 	 	 . 53

EXCESSIVE ABS FUNCTION OPERATION

FREQUENCY		54
Diagnosis Procedure	9	54

- UNEXPECTED PEDAL REACTION55

PEDAL VIBRATION	OR ABS OPERATION
SOUND OCCURS	
Diagnosis Procedure	

- PRECAUTION 60

PRECAUTIONS	60
Precaution for Supplemental Restraint System	
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	
SIONER" Service	. 60
Precaution for Brake System	. 60
Precaution for Brake Control	

PREPARATION	
Special Service Tool	
Commercial Service Tool .	

ON-VEHICLE REPAIR 63

WHEEL SENSORS	
SENSOR ROTOR	
Removal and Installation	

ABS ACTUATOR AND ELECTRIC UI (CONTROL UNIT)	
Exploded View	
Removal and Installation	
TCS/ABS	
BASIC INSPECTION	68
DIAGNOSIS AND REPAIR WORKFL	OW 68
Work Flow	
Diagnostic Work Sheet	
FUNCTION DIAGNOSIS	71
TCS	
System Diagram	
System Description	
Component Parts Location	
CONSULT-III Function (ABS)	
COMPONENT DIAGNOSIS	
C1101, C1102, C1103, C1104 WHEE	-
SOR-1	
Description	
DTC Logic	
Diagnosis Procedure	
Component Inspection	83
C1105, C1106, C1107, C1108 WHEE SOR-2	
SOR-2	84
SOR-2 Description DTC Logic	84
SOR-2 Description DTC Logic Diagnosis Procedure	84 84 84 84 84
SOR-2 Description DTC Logic	84 84 84 84 84
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [A	84 84 84 84 84 86 BNOR-
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [A MAL]	84 84 84 84 84 86 BNOR- 87
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description	84 84 84 84 84 86 BNOR- 87 87
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [A MAL]	84 84 84 84 84 86 87 87 87 87 87 87
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic Diagnosis Procedure	84 84 84 84 84 86 BNOR- 87 87 87 87 87 87 87 87
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic Diagnosis Procedure DTC C1110 CONTROL FAILURE	84 84 84 84 86 BNOR- 87 87 87 87 87 87 87 87 87
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic Diagnosis Procedure	84 84 84 84 86 BNOR- 87 87 87 87 87 87 89 89
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [A MAL] Description DTC Logic Diagnosis Procedure DTC Logic DTC Logic DTC Logic Diagnosis Procedure	84 84 84 84 86 BNOR- 87 87 87 87 87 87 89 89 89
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic Diagnosis Procedure DTC C1110 CONTROL FAILURE DTC Logic DTC Logic DTC Logic DTC Logic DTC Logic DTC Logic DTC Logic DTC LOGIC DTC LOGIC	84 84 84 84 86 BNOR- 87 87 87 87 87 89 89 89 89 89
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic Diagnosis Procedure DTC C1110 CONTROL FAILURE DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure	84 84 84 84 86 BNOR- 87 87 87 87 87 87 87 87 87 89 89 90 90
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic Diagnosis Procedure DTC C1110 CONTROL FAILURE DTC Logic DTC Logic DTC Logic DTC Logic DTC Logic DTC Logic DTC Logic DTC LOGIC DTC LOGIC	84 84 84 84 86 BNOR- 87 87 87 87 87 87 87 89 89 89 90 90 90
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic DTC C1110 CONTROL FAILURE DTC Logic DTC Logic DTC Logic DTC Logic DTC Logic DTC Logic DTC C1111 PUMP MOTOR DTC Logic DTC Logic	84 84 84 84 86 BNOR- 87 87 87 87 87 87 89 89 89 90 90 90 90
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic Diagnosis Procedure DTC Logic DTC Logic DTC Logic Diagnosis Procedure DTC C1111 PUMP MOTOR DTC Logic DESCRIPTION DTC LOGIC DTC LOGIC DTC LOGIC DTC LOGIC DTC LOGIC DTC LOGIC DTC LOGIC	84 84 84 84 86 BNOR- 87 87 87 87 87 87 87 89 89 89 90 90 90 90 90
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic Diagnosis Procedure DTC C1110 CONTROL FAILURE DTC Logic Diagnosis Procedure DTC C1111 PUMP MOTOR DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure Diagnosis Procedure	
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic Diagnosis Procedure DTC C1110 CONTROL FAILURE DTC Logic DTC Logic Diagnosis Procedure DTC Logic DTC C1114 MAIN RELAY DTC Logic	84 84 84 84 86 BNOR- 87 87 87 87 87 87 89 89 89 90 90 90 90 90 90 90 90 90
SOR-2 Description DTC Logic Diagnosis Procedure Component Inspection DTC C1109 BATTERY VOLTAGE [AI MAL] Description DTC Logic Diagnosis Procedure DTC C1110 CONTROL FAILURE DTC Logic Diagnosis Procedure DTC C1111 PUMP MOTOR DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure DTC Logic Diagnosis Procedure Diagnosis Procedure	84 84 84 84 86 BNOR- 87 87 87 87 89 89 89 90 90 90 90 90 90 90 90 90 90 90 90 90

DTC C1115 ABS SENSOR [ABNORMAL SIG-

Description94
DTC Logic94
Diagnosis Procedure94
Component Inspection95
C1120, C1122, C1124, C1126 IN ABS SOL97
Description
DTC Logic
Diagnosis Procedure
Component Inspection98
C1121, C1123, C1125, C1127 OUT ABS SOL99
Description
DTC Logic
Diagnosis Procedure
0
Component Inspection100
C1130, C1131, C1132, C1133 ENGINE SIG-
NAL
Description101
DTC Logic
Diagnosis Procedure
Component Inspection & Special Repair Require-
ment
U1000 CAN COMM CIRCUIT102
Description
DTC Logic
Diagnosis Procedure
-
ABS WARNING LAMP103
Description103
Component Function Check 103
Diagnosis Procedure103
BRAKE WARNING LAMP
Description
Component Function Check
Diagnosis Procedure104
TCS OFF SWITCH105
Description
Component Function Check
Diagnosis Procedure
Component Inspection
ECU DIAGNOSIS 107
(CONTROL UNIT)107
Reference Value
Wiring Diagram - Coupe109
Wiring Diagram - Sedan115
Fail-Safe119
DTC No. Index 120
SYMPTOM DIAGNOSIS 122
TCS122
Symptom Table

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY	A
UNEXPECTED PEDAL REACTION	В
THE BRAKING DISTANCE IS LONG 125 Diagnosis Procedure	С
ABS FUNCTION DOES NOT OPERATE 126 Diagnosis Procedure	D
PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS 127 Diagnosis Procedure 127	E
VEHICLE JERKS DURING TCS/ABS CON- TROL	BRC
NORMAL OPERATING CONDITION	G
PRECAUTION130	
PRECAUTIONS	Η
SIONER" Service	I
PREPARATION132	J
PREPARATION	K
ON-VEHICLE REPAIR 133	I
WHEEL SENSORS	L
SENSOR ROTOR	M
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	N
BASIC INSPECTION 138	Ρ
DIAGNOSIS AND REPAIR WORKFLOW 138 Work Flow	
INSPECTION AND ADJUSTMENT	

ADDITIONAL SERVICE WHEN REPLACING	Diagno
CONTROL UNIT142	Comp
ADDITIONAL SERVICE WHEN REPLACING	
CONTROL UNIT : Description142	DTC C1
ADDITIONAL SERVICE WHEN REPLACING	NAL]
CONTROL UNIT : Special Repair Requirement142	Descri
ADJUSTMENT OF STEERING ANGLE SENSOR	DTC L
NEUTRAL POSITION	Diagno
ADJUSTMENT OF STEERING ANGLE SENSOR	Comp
NEUTRAL POSITION : Description	DTC C1
ADJUSTMENT OF STEERING ANGLE SENSOR	Descri
NEUTRAL POSITION : Special Repair Require-	DTC L
ment142	Diagno
	Comp
FUNCTION DIAGNOSIS144	
	C1120,
VDC/TCS/ABS	Descri
System Diagram	DTC L
System Description	Diagno
Component Parts Location	Comp
Component Description148 CONSULT-III Function (ABS)148	C1121,
	Descri
COMPONENT DIAGNOSIS155	DTC L
	Diagno
C1101, C1102, C1103, C1104 WHEEL SEN-	Comp
SOR-1 155	
Description155	C1130,
DTC Logic155	GINE S
Diagnosis Procedure155	Descri
Component Inspection157	DTC L
C1105, C1106, C1107, C1108 WHEEL SEN-	Diagno
SOR-2	Specia
	DTC C1
Description158 DTC Logic158	Descri
Diagnosis Procedure	DCSCI
Component Inspection	Diagno
	Comp
DTC C1109 BATTERY VOLTAGE [ABNOR-	Specia
MAL] 161	
Description161	C1143,
DTC Logic	Descri
Diagnosis Procedure161	DTC L
	Diagno
C1110, C1153, C1170 ABS ACTUATOR AND	Comp
ELECTRIC UNIT (CONTROL UNIT) 163	Specia
DTC Logic	C1145,
Diagnosis Procedure	Descri
Special Repair Requirement163	DC3CH
DTC C1111 PUMP MOTOR 164	Diagno
Description	Comp
DTC Logic164	Specia
Diagnosis Procedure	
Component Inspection	C1147,
	Descri
DTC C1114 MAIN RELAY 166	DTC L
Description166	Diagno
DTC Logic166	Comp
RP	C-4

Diagnosis Procedure
DTC C1115 ABS SENSOR [ABNORMAL SIG-
IAL] 168Description168DTC Logic168Diagnosis Procedure168Component Inspection169
DTC C1116 STOP LAMP SW171Description171DTC Logic171Diagnosis Procedure171Component Inspection172
C1120, C1122, C1124, C1126 IN ABS SOL173 Description 173 DTC Logic 173 Diagnosis Procedure 173 Component Inspection 174
C1121, C1123, C1125, C1127 OUT ABS SOL.175 Description 175 DTC Logic 175 Diagnosis Procedure 175 Component Inspection 176
C1130, C1131, C1132, C1133, C1136 EN- GINE SIGNAL 177 Description 177 DTC Logic 177 Diagnosis Procedure 177 Special Repair Requirement 177
DTC C1142 PRESS SEN CIRCUIT179Description179DTC Logic179Diagnosis Procedure179Component Inspection180Special Repair Requirement180
C1143, C1144 STEERING ANGLE SENSOR181Description181DTC Logic181Diagnosis Procedure181Component Inspection182Special Repair Requirement182
C1145, C1146 YAW RATE/SIDE G SENSOR183Description183DTC Logic183Diagnosis Procedure183Component Inspection185Special Repair Requirement185
C1147, C1148, C1149, C1150 USV/HSV LINE.186 Description 186 DTC Logic 186 Diagnosis Procedure 186 Component Inspection 187

BRC-4

Special Repair Requirement	187
DTC C1154 PNP POS SIG	189
Description	
DTC Logic	
Diagnosis Procedure	
5	
DTC C1155 BR FLUID LEVEL LOW	
Description	
DTC Logic	190
Diagnosis Procedure	190
Component Inspection	
Special Repair Requirement	192
DTC C1156 ST ANG SEN COM CIR	
Description	
DTC Logic	193
Diagnosis Procedure	193
U1000 CAN COMM CIRCUIT	
Description	194
DTC Logic	194
Diagnosis Procedure	194
PARKING BRAKE SWITCH	
Description	195
Component Function Check	195
Diagnosis Procedure	
Component Inspection	
VDC OFF SWITCH	197
Description	197
Component Function Check	197
Diagnosis Procedure	
Component Inspection	
ABS WARNING LAMP	
Description	199
Component Function Check	199
Diagnosis Procedure	199
-	
BRAKE WARNING LAMP	
Description	
Component Function Check	
Diagnosis Procedure	200
VDC OFF INDICATOR LAMP	
Description	201
Component Function Check	201
Diagnosis Procedure	201
SLIP INDICATOR LAMP	
Description	
Component Function Check	
Diagnosis Procedure	202
ECU DIAGNOSIS	203
ABS ACTUATOR AND ELECTRIC UNIT	
(CONTROL UNIT)	
Reference Value	
Wiring Diagram - Coupe	206

Wiring Diagram - Sedan214 Fail-Safe221 DTC No. Index222	А
SYMPTOM DIAGNOSIS 225	В
VDC/TCS/ABS	_
EXCESSIVE ABS FUNCTION OPERATION FREQUENCY	C
UNEXPECTED PEDAL REACTION	_
THE BRAKING DISTANCE IS LONG	E
ABS FUNCTION DOES NOT OPERATE 229 Diagnosis Procedure	BR
PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS 230 Diagnosis Procedure 230	G
VEHICLE JERKS DURING VDC/TCS/ABS CONTROL	Н
PRECAUTION232	
PRECAUTIONS	J
Precaution for Brake Control232	
PREPARATION234	L
PREPARATION	M
ON-VEHICLE REPAIR 235	
WHEEL SENSORS	Ν
SENSOR ROTOR	0
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	Ρ
G SENSOR	
STEERING ANGLE SENSOR	

< BASIC INSPECTION >

BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001341853

[ABS]

DESCRIPTION

Basic Concept

- The most important point to perform trouble diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.
- It is also important to clarify customer complaints before inspection.

First of all, reproduce symptom, and understand it fully.

Ask customer about his/her complaints carefully. In some cases, they will be necessary to check symptom by driving vehicle with customer.

CAUTION:

Customers are not professionals. Do not assume "maybe customer means..." or "maybe customer mentioned this symptom".

• It is essential to check symptoms right from the beginning in order to repair a malfunction completely.

For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.

- After diagnostic, make sure to perform "ERASE MEMORY". Refer to <u>BRC-12, "CONSULT-III Function (ABS)"</u>.
- Always read "GI General Information" to confirm general precautions. Refer to <u>BRC-12, "CONSULT-III Function (ABS)"</u>.

Asking Complaints

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnostic sheet so as not to miss information.







DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[ABS]

Ρ



< BASIC INSPECTION >

Diagnostic Work Sheet

INFOID:000000001341854

DIAGNOSIS AND REPAIR WORKFLOW	
-------------------------------	--

Customer name MR/MS	Model & Year	Model & Year		VIN	
Engine #	Trans.	Trans.		Mileage	
Incident Date	Manuf. Date	Manuf. Date		e	
Symptoms	 ☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle) 	UWarning / Indicator activate		Firm pedal operation Large stroke pedal operation	
	□ 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 starting	U When starting I After starting			
Road conditions	□ Low friction road (□Snow □Grave □ Bumps / potholes	□ 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 				

LFIA0176E

FUNCTION DIAGNOSIS ABS

ABS

INFOID:000000001341855

А

System Diagram



System Description

INFOID:000000001341856 Н

Κ

L

Μ

ABS SYSTEM

In case of electrical malfunctions with the ABS, ABS warning lamp will turn ON and the condition of the vehicle will be fail-safe which is the same condition of vehicles without ABS system. NOTE:

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition J switch ON" and "The first starting" are being performed.

CAUTION:

If the Fail-Safe function is activated, then perform self-diagnosis for ABS control system.

PURPOSE

The Anti-lock Brake System (ABS) consists of electronic and hydraulic components. It allows for control of braking force so that locking of the wheels can be avoided. The ABS:

- Ensures proper tracking performance through steering wheel operation.
- Enables obstacles to be avoided through steering wheel operation.
- Enables vehicle stability by preventing flat spins.

OPERATION

- When the vehicle speed is less than 10 km/h (6 MPH) this system does not work.
- The ABS has self-test capabilities. The system turns on the ABS warning lamp for 2 seconds after turning Ν the ignition switch ON. The system performs another test the first time the vehicle reaches 6 km/h (4 MPH). A mechanical noise may be heard a sthe ABS performs a self-test. This is a normal part of the self-test feature. If a malfunction is found during this check, the ABS warning lamp will come on.
- Dyring ABS operation, a mechanical noise may be heard. This is a normal condition.

FAIL SAFE

If trouble occurs in the ABS, the ABS warning lamp in the combination meter comes on. At the same time, the P vehicle stops the ABS control and braking becomes the same as that of a vehicle without ABS.

< FUNCTION DIAGNOSIS >

ELECTRICAL COMPONENTS



HYDRAULIC CIRCUIT DIAGRAM



- Inlet solenoid valve 1.
- 2. Outlet solenoid valve
- Reservoir

4. Pump 7. Outlet valve

- 5. Motor 8. Bypass check valve
- 6. Inlet valve
- 9. Damper

OPERATION THAT IS NOT "SYSTEM ERROR"

ABS

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

CAN Communication Refer to LAN-7, "System Description".

В·

А

Component Parts Location

C -

a

Е

С

F

⁸⁰100

F

В

E (5)



В

INFOID:000000001341857



D

Ε





Н





L



Ν

Ο

1. Front wheel sensor RH E41

А

D

- 4. Rear wheel sensor LH B43
- ABS actuator and electric unit (control 3. 2. unit) E26

c : BRAKE

d : (())

- Combination meter M24 5.
 - a. US models
 - b. Canada models
 - c. US models

a : ABS

b : 🔊

d. Canada models

Rear wheel sensor RH B43

AWFIA0181GB

D

- 6. Front wheel sensor LH E19

Ρ

< FUNCTION DIAGNOSIS >

Component Description

INFOID:00000000134185	8

[ABS]

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BBC 25 "Description"
	Motor	BRC-25, "Description"
	Actuator relay (Main relay)	BRC-27, "Description"
	Solenoid valve	BRC-32, "Description"
Wheel sensor		BRC-16, "Description"
ABS warning lamp		BRC-37, "Description"
Brake warning lamp		BRC-38, "Description"

CONSULT-III Function (ABS)

INFOID:000000001341859

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.	
Function test	Performed by CONSULT-III instead of a technician to determine whether each system is "OK" or "NG".	
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.	

SELF-DIAGNOSIS RESULTS

Operation Procedure

- 1. Turn ignition switch OFF.
- 2. Connect CONSULT-III to data link connector.
- 3. Turn ignition switch ON.
- 4. Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- 5. After stopping vehicle, with the engine running, touch "ABS", "SELF-DIAG RESULTS" in order on the CONSULT-III screen.
- 6. The self-diagnostic results are displayed.
 - Check ABS warning lamp. If "NO FAILURE" is displayed. Refer to <u>BRC-37</u>, "Component Function <u>Check"</u>.
- 7. Perform the appropriate inspection from display item list, and repair or replace the malfunctioning component. Refer to "Display Item List".
- 8. Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute. CAUTION:

When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driven at approximately 30 km/h (19 MPH) or more for approximately 1 minute.

Erase Memory

- 1. Turn ignition switch OFF.
- Start engine and touch "ABS", "SELF-DIAG RESULTS", "ERASE MEMORY" in order on the CONSULT-III screen to erase the diagnostic memory. If "ABS" is not indicated, go to GI-51, "CONSULT-III Data Link Connector (DLC) Circuit".

ABS

BRC-12

< FUNCTION DIAGNOSIS >

CAUTION: If the diagnostic memory is not erased, re-perform the operation from step 4.

- 3. Perform self-diagnosis again, and make sure that diagnostic memory is erased.
- 4. 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.

NOTE:

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

Display item	Malfunction detecting condition	Check item	D
RR RH SENSOR-1 [C1101] ^{*1}	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard. Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard. BRC-16, "Diac sis Procedure" (Note 1) Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard. Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard. BRC-16, "Diac sis Procedure" (Note 1)		
RR LH SENSOR-1 [C1102] ^{*1}			E
FR RH SENSOR-1 [C1103] ^{*1}			BRC
FR LH SENSOR-1 [C1104] ^{*1}	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is out- side the standard.		G
RR RH SENSOR-2 [C1105] ^{*1}	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.		Н
RR LH SENSOR-2 [C1106] ^{*1}	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.	BRC-19, "Diagno- sis Procedure"	11
FR RH SENSOR-2 [C1107] ^{*1}	When the circuit in the front RH wheel sensor is short-circuited. Or when the dis- tance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	(Note 1)	
FR LH SENSOR- 2 [C1108] ^{*1}	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.		J
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-22, "Diagno- sis Procedure"	K
CONTROLLER FAILURE [C1110] ^{*2}	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-24, "Diagno- sis Procedure"	L
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.	BRC-25, "Diagno-	M
[C1111]	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	sis Procedure"	IVI
MAIN RELAY	During the actuator relay operating with OFF, when the actuator relay turns ON. OrRELAYwhen the control line for the relay is shorted to the ground.		Ν
[C1114]	During the actuator relay operating with ON, when the actuator relay turns OFF, or when the control line for the relay is open.	sis Procedure"	0
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	ORMAL SIGNAL] When wheel sensor input signal is malfunctioning.		0
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-32, "Diagno- sis Procedure"	Ρ
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"	_
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-32, "Diagno- sis Procedure"	_

В

А

С

ABS

< FUNCTION DIAGNOSIS >

- 6	• •		C1
	А	Б	
L		-	U

Display item	Malfunction detecting condition	Check item
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	BRC-32, "Diagno- sis Procedure"
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-32, "Diagno- sis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"
CAN COMM CIRCUIT [U1000] ^{*3}	When there is a malfunction in the CAN communication circuit.	BRC-36, "Diagno- sis Procedure"

*1: Be sure to confirm the ABS warning lamp illuminates when the ignition switch is turned ON after repairing the shorted sensor circuit, but the lamp turns off when driving the vehicle over 30 km/h (19 MPH) for approximately 1 minute in accordance with SELF-DIAGNOSIS PROCEDURE.

*2: When "CONTROLLER FAILURE" is displayed, check to see if the ABS warning lamp is burned out, and check the circuit between the ABS warning lamp and ABS actuator and electric unit (control unit) for open or short. Then, check the ABS actuator and electric unit (control unit) and circuit.

*3: When malfunctions are detected in several systems, including CAN communication circuit [U1000], troubleshoot CAN communiation circuit first. Refer to <u>BRC-36</u>, "Diagnosis Procedure".

DATA MONITOR

Display Item List

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.

ltem	Data	monitor item sele	ection	
(Unit)	ECU INPUT SIGNALS	MAIN SIG- NALS	SELECTION FROM MENU	Remarks
FR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by front LH wheel sensor sig- nal is displayed.
FR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
RR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (con- trol unit) 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.
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.



[ABS]

Е

BRC

Ν

Ρ

< FUNCTION DIAGNOSIS >

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.
ABS WARN LAMP (ON/OFF)	_	×	×	ABS warning lamp (ON/OFF) status is displayed.

×: Applicable

-: Not applicable

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

ACTIVE TEST

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 and brake warning lamp are ON.
- ABS warning lamp and brake warning lamp are ON during active test.

Operation Procedure

NOTE:

- When active test is performed while depressing the pedal, the pedal depression amount will change. This is Н 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" to restart the process.

Solenoid Valve

NOTE:

- The example shown is for front right wheel. The procedure for the other wheels is the same as given below.
- 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 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 (IN, OUT) operate as shown in Κ the table below.

Operation	AE	S solenoid va	alve	ABS	solenoid valv	e (ACT)	L
(Note)	UP	KEEP	DOWN	UP	ACT UP	ACT KEEP	
FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF	M
FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF	

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

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

ABS Motor

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 (Note)	ON	ON

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

BRC-15

< COMPONENT DIAGNOSIS >

COMPONENT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:000000001341860

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:000000001341861

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-16. "Diagnosis Procedure"</u>.

NO >> INSPECTION END

DTC Confirmation Procedure

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CHECK CONNECTOR

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26 and malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH). Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Disconnect connectors from wheel sensor of malfunction code No.

2. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.

3. Turn on the ABS active wheel sensor tester power switch.

NOTE:

BRC-16

INFOID:000000001341862

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

[ARS]

< COMPONENT DIAGNOSIS > [ABS]	
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.	A
NOTE: If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.	В
Does the ABS active wheel sensor tester detect a signal?	
YES >> GO TO 3	С
NO >> Replace wheel sensor. Refer to <u>BRC-63, "Removal and Installation"</u> .	
3.CHECK TIRE	D
Check air pressure, wear and size.	
Are air pressure, wear and size within standard?	
YES >> GO TO 4	E
 NO >> • Adjust air pressure, or replace tire. • Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED". 	
	BRC
Check wheel bearing axial end play. Refer to <u>FAX-5, "Inspection"</u> (front) or <u>RAX-5, "On-vehicle Service"</u> (rear). Is the inspection result normal?	
YES >> GO TO 5	G
NO >> Repair or replace as necessary. Refer to <u>FAX-7. "Removal and Installation"</u> (front) or <u>RAX-6.</u> <u>"Removal and Installation"</u> (rear).	
5. CHECK WHEEL SENSOR HARNESS	Н
1. Turn ignition switch OFF and disconnect malfunctioning wheel	
sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH) and ABS actuator and electric unit (control unit) connector E26.	
2. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor	J
harness inside the wheel house is moved.)	К
	L

	Power sup	oply circuit	Signal circuit		G	Ground circuit	
Wheel	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (Signal - Ground) (A)	ABS actuator and electric unit (control unit) (A) (Signal) - Body Ground	
Front RH	9	1	10	2	9, 10 - 1, 4	9, 10 - Body ground	
Front LH	16	1	5	2	16, 5 - 1, 4	16, 5 - Body ground	
Rear RH	8	3	19	4	8, 19 - 1, 4	8, 19 - Body ground	
Rear LH	6	1	17	2	6, 17 - 1, 4	6, 17 - Body ground	

Power supply circuit Signal circuit

: Continuity should exist.

- : Continuity should exist.
- **Ground circuit**
- : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> • Repair or replace malfunctioning components.

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[ABS]

INFOID:000000001341863

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

6.CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- Reconnect ABS actuator and electric unit (control unit) connector.
- 2. Turn ignition switch ON and check between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH (A)			
Front LH (A)	1		8 V or more
Rear LH (B)		_	8 V 01 1101e
Rear RH (B)	3		



Is the inspection result normal?

YES >> Inspection end.

NO >> Replace ABS actuator and electric unit (control unit).

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 <u>BRC-16, "Diagnosis Procedure"</u>.

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

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

INFOID:000000001341865

INFOID:000000001341864

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1105	RR RH SENSOR-2	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	 Harness or connector Wheel sensor ABS actuator and electric unit (control unit) 	
C1106	RR LH SENSOR-2	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.		E
C1107	FR RH SENSOR-2	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.		BRC
C1108	FR LH SENSOR-2	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-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-19, "Diagnosis Procedure"</u>. NO >> INSPECTION END

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CHECK CONNECTOR

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26 and malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH). Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.

Is the inspection result normal?

YES	>> GO	TO 2	
	_		

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Disconnect connectors from wheel sensor of malfunction code No.

2. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.

3. 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.

BRC-19

С

Н

Κ

Μ

Ρ

INFOID:000000001341866

В

А

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[ABS]

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

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

Does the ABS active wheel sensor tester detect a signal?

- YES >> GO TO 3
- NO >> Replace wheel sensor. Refer to <u>BRC-63, "Removal and Installation"</u>.

3.CHECK TIRE

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

- YES >> GO TO 4
- NO >> Adjust air pressure, or replace tire.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "Inspection" (front) or <u>RAX-5</u>, "On-vehicle Service" (rear). Is the inspection result normal?

- YES >> GO TO 5
- NO >> Repair or replace as necessary. Refer to <u>FAX-7, "Removal and Installation"</u> (front) or <u>RAX-6,</u> <u>"Removal and Installation"</u> (rear).

5.CHECK WHEEL SENSOR HARNESS

- Turn ignition switch OFF and disconnect malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH) and ABS actuator and electric unit (control unit) connector E26.
- 2. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)



	Power sup	oply circuit	Signal	circuit	G	round circuit
Wheel	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (Signal - Ground) (A)	ABS actuator and electric unit (control unit) (A) (Signal) - Body Ground
Front RH	9	1	10	2	9, 10 - 1, 4	9, 10 - Body ground
Front LH	16	1	5	2	16, 5 - 1, 4	16, 5 - Body ground
Rear RH	8	3	19	4	8, 19 - 1, 4	8, 19 - Body ground
Rear LH	6	1	17	2	6, 17 - 1, 4	6, 17 - Body ground

Power supply circuit Signal circuit Ground circuit

: Continuity should exist.

: Continuity should exist.

: Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

BRC-20

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

6.CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- Reconnect ABS actuator and electric unit (control unit) connector.
- 2. Turn ignition switch ON and check between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH (A)			
Front LH (A)	1		8 V or more
Rear LH (B)		_	8 4 01 11016
Rear RH (B)	3		

Is the inspection result normal?

YES >> Inspection end.

NO >> Replace ABS actuator and electric unit (control unit).

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.

	1
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-19, "Diagnosis Procedure"</u>.



1867 BRC

INFOID:000000001341867

Е

Κ

L

Μ

Ν

Ρ

А

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

< COMPONENT DIAGNOSIS >

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

Description

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

DTC Logic

INFOID:000000001341869

INFOID:000000001341870

INFOID:000000001341868

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 <u>BRC-22, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> GO TO 2

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

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.
- 2. Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 18 and ground.



DTC C1109 BATTERY VOLTAGE [ABNORMAL]

< COMPONENT DIAGNOSIS >

 ABS actuator and electric unit (control unit)
 Ground
 Condition
 Voltage

 18
 Ignition switch ON
 Battery voltage (Approx. 12 V)

 Ignition switch OFF
 Approx. 0 V

- 3. Turn ignition switch OFF.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4	—	Yes

Is the inspection result normal?

NO

- YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
 - >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".





Н

Κ

L

Μ

Ν

Ρ

[ABS]

В

А

DTC C1110 CONTROL FAILURE

< COMPONENT DIAGNOSIS >

DTC C1110 CONTROL FAILURE

DTC Logic

INFOID:000000001341871

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

CONTROLLER FAILURE

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-24, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001341872

INSPECTION PROCEDURE

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

CAUTION:

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

>> Replace ABS actuator and electric unit (control unit).

DTC C1111 PUMP MOTOR

< COMPONENT DIAGNOSIS >

DTC C1111 PUMP MOTOR

Description

INFOID:000000001341873 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
CIIII	FUMF MOTOR	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	
DTC CC	ONFIRMATION PROCE	DURE	
1. CHEC	CK SELF-DIAGNOSIS RE	SULTS	
Check th	ne self-diagnosis results.		
	Self-diagnosis PUMP MO		
Is above	displayed on the self-dia		
YES NO		procedure. Refer to <u>BRC-25, "Diagnosis Proced</u>	<u>ure"</u> .
Diagno	sis Procedure		INFOID:000000001341875
INSPEC	TION PROCEDURE		
1. CHEC	CK CONNECTOR		
cheo repla		d disconnect ABS actuator and electric unit (c n, disconnection, looseness, and so on. If any ma form self-diagnosis.	
Is the ins	spection result normal?	-	
	>> Inspection end. >> GO TO 2		
2. сне	CK ABS MOTOR AND M	IOTOR RELAY POWER SUPPLY CIRCUIT	
1. Turn	ignition switch OFF and	disconnect ABS actuator and electric unit (contro	ol unit) connector E26.

INFOID:000000001341874

1	Λ
Γ	7

В

С

D

DTC C1111 PUMP MOTOR

< COMPONENT DIAGNOSIS >

 Check voltage between the ABS actuator and electric unit (control unit) harness connector E26 terminal 2 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
2	_	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3

NO

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4		Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection

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 (Note)	ON	ON

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-25. "Diagnosis Procedure"</u>.



Õff

ν

Ð

INFOID:000000001341876

WFIA0501E

DTC C1114 MAIN RELAY

< COMPONENT DIAGNOSIS >

DTC C1114 MAIN RELAY

Description

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

DTC Logic

INFOID:000000001341878

INFOID:000000001341877

DTC DETECTION LOGIC

DTC	Display item	Malfu	nction detected conditior	ו	Possible cause	D
C1114	MAIN RELAY		r relay operating with OF s ON, or when the contro the ground.		 Harness or connector ABS actuator and electric unit 	Е
01114			r relay operating with ON s ON, or when the contro		(control unit)	BRC
DTC CC	NFIRMATION PROCED	URE				BRO
1. CHEC	K SELF-DIAGNOSIS RES	SULTS				
Check th	e self-diagnosis results.					G
	Self-diagnosis r					Н
	MAIN RELA					
	displayed on the self-diag					1
	>> Proceed to diagnosis p > INSPECTION END	rocedure. Refer	to <u>BRC-27, "Diagno</u>	osis Proced	<u>ure"</u> .	I
-	sis Procedure					
Diagno					INFOID:000000001341879	J
INSPEC [®]	TION PROCEDURE					
1. CHEC	K CONNECTOR					К
1. Turn	ignition switch OFF and	disconnect ABS	S actuator and elec	ctric unit (c	ontrol unit) connector E26,	
chec	k terminal for deformation,				alfunction is found, repair or	
	ace terminal.	orm self-diagnos	is			L
	pection result normal?					
-	>> Inspection end.					M
-	>> GO TO 2					
2.CHEC	K SOLENOID AND ACTU	ATOR RELAY F	OWER SUPPLY C	IRCUIT		NI
	ignition switch OFF and d			c unit (contr	ol unit) connector E26.	Ν
	ck voltage between ABS a harness connector E26 te				the second se	
um)		inninai 5 anu gro	Junu.			0
ABS actu	ator and electric unit (control unit) Ground	Voltage			
	3		Battery voltage	3		Р
	-		(Approx. 12 V)			1
	pection result normal?			Ţ		
YES >> GO TO 3 NO >> • Repair or replace malfunctioning components. \underline{I}						
	• Perform the self-dia	gnosis, and ma	ke sure that the		WFIA0499E	
	result shows "NO DT	C IS DETECTE	D″.			

А

С

DTC C1114 MAIN RELAY

< COMPONENT DIAGNOSIS >

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4	—	Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection



INFOID:000000001341880

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 (Note)	ON	ON

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-27</u>, "Diagnosis Procedure".

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< COMPONENT DIAGNOSIS >

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

Description

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

DTC Logic

INFOID:000000001341882

INFOID:000000001341881

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	Harness or connector Wheel sensor	E
DTC CC		DURE		
1.снес	CK SELF-DIAGNOSIS RE	SULTS	В	BRC
Check th	e self-diagnosis results.			
				G
	Self-diagnosis			
la abava	ABS SENSOR [ABNOR	-		Н
	displayed on the self-diag			
	>> Inspection end.	procedure. Refer to <u>BRC-29, "Diagnosis Procec</u>	<u>lure</u> .	
	sis Procedure		INFOID:000000001341883	
CAUTIO Do not c	<mark>N:</mark> :heck between wheel sei	nsor terminals.		J
INSPEC	TION PROCEDURE			
1. CHEC				K
	r pressure, wear and size			
	ressure, wear and size wit			
YES	>> GO TO 2			L
NO	 Adjust air pressure, Perform the self-diac 	or replace tire. gnosis, and make sure that the result shows "No	O DTC IS DETECTED"	
2.снес	CK SENSOR AND SENSO	-		M
	sensor rotor for damage.			
	•	, disconnection or looseness.		Ν
	spection result normal? >> GO TO 3			
	>> • Repair wheel sensor	mount or replace sensor rotor. Then perform the norm the perform the perform the result shows "Normanian states and make sure that the result shows "Normanian states are the result shows the states are states		0
3. CHEC	CK CONNECTOR			
malf	unctioning wheel sensor o al to see if it is deformed, o	disconnect ABS actuator and electric unit (contonnector E41 (FR-RH), E19 (FR-LH), B43 (RR- disconnected, loose, etc., Repair or replace it if	RH and RR-LH). Check ter-	Ρ
	onnect connectors and th	en perform the self-diagnosis. Refer to BRC-	12, "CONSULT-III Function	
Is the ins	spection result normal?			

BRC-29

А

С

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< COMPONENT DIAGNOSIS >

[ABS]

INFOID:000000001341884

NO >> GO TO 4

4.CHECK WHEEL SENSOR HARNESS

- Turn ignition switch OFF and disconnect malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH) and ABS actuator and electric unit (control unit) connector E26.
- 2. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)



	Power sup	oply circuit	Signal	circuit	G	round circuit
Wheel	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (Signal - Ground) (A)	ABS actuator and electric unit (control unit) (A) (Signal) - Body Ground
Front RH	9	1	10	2	9, 10 - 1, 4	9, 10 - Body ground
Front LH	16	1	5	2	16, 5 - 1, 4	16, 5 - Body ground
Rear RH	8	3	19	4	8, 19 - 1, 4	8, 19 - Body ground
Rear LH	6	1	17	2	6, 17 - 1, 4	6, 17 - Body ground

Power supply circuit

- Signal circuit
- : Continuity should exist. : Continuity should exist.
- **Ground circuit**
- : Continuity should not exist.

Is the inspection result normal?

- YES >> GO TO 5 NO >> • Repair o
 - >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

5.CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- 1. Replace wheel sensor that resulted in malfunction by self-diagnosis.
- Reconnect connectors, drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is above displayed on the self-diagnosis display?

- YES >> Inspection end.
- NO >> Replace ABS actuator and electric unit (control unit).
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection

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)

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< COMPONENT DIAGNOSIS > FR LH SENSOR FR RH SENSOR RR LH SENSOR RR RH SENSOR Is the inspection result normal? YES YES Solution of the section result normal. NO >> Go to diagnosis procedure. Refer to BRC-29, "Diagnosis Procedure".

Ε

А

В

С

D

[ABS]

BRC

Н

J

Κ

L

Μ

Ν

Ο

Ρ

G

< COMPONENT DIAGNOSIS >

C1120, C1122, C1124, C1126 IN ABS SOL

Description

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

INFOID:000000001341886

INFOID:000000001341885

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.

Solf 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-32, "Diagnosis Procedure"</u>.

NO >> Inspection end.

Diagnosis Procedure

INFOID:000000001341887

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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.

Is the inspection result normal?

YES >> Inspection end.

NO >> GO TO 2

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.

BRC-33

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

 Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
3	_	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3

NO

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4		Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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.

NOTE:

The example below is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Nate)	ABS solenoid valve			
Operation (Note)	UP	KEEP	DOWN	
FR RH IN SOL	OFF	ON	ON	
FR RH OUT SOL	OFF	OFF	ON*	

*: ON for 1 to 2 seconds after the touch, and then OFF.

NOTE:

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

Is the inspection result normal?

YES >> Inspection end.

NO >> Go to diagnosis procedure. Refer to <u>BRC-32. "Diagnosis Procedure"</u>.



[ABS]

DISCONNEC

OFF

WFIA0499E

А

В

D

J

Κ

- Ν
- 0

Ρ



C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

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

INFOID:000000001341890

INFOID:000000001341889

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 <u>BRC-34, "Diagnosis Procedure"</u>.

NO >> Inspection end.

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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.

Is the inspection result normal?

YES >> Inspection end.

NO >> GO TO 2

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.

BRC-34

INFOID:000000001341891

< COMPONENT DIAGNOSIS >

2. Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
3	—	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3 NO >> • Repair of

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4		Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
 NO >> Repair or replace malfunctioning components.
 - >> Repair or replace malfunctioning components.
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection



- 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.

NOTE:

The example below is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Note)	ABS solenoid valve			L
Operation (Note)	UP	KEEP	DOWN	
FR RH IN SOL	OFF	ON	ON	M
FR RH OUT SOL	OFF	OFF	ON*	

*: ON for 1 to 2 seconds after the touch, and then OFF.

NOTE:

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

Is the inspection result normal?

YES >> Inspection end.

NO >> Go to diagnosis procedure. Refer to <u>BRC-34. "Diagnosis Procedure"</u>.







Κ

Ν

[ABS]

А

В

D

U1000 CAN COMM CIRCUIT

Description

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

DTC Logic

INFOID:000000001341894

INFOID:000000001341895

INFOID:000000001341893

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

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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

Is above displayed on the self-diagnosis display?

YES >> Refer to <u>GI-50, "Description"</u>.

NO >> Inspection end.
ABS WARNING LAMP

< COMPONENT DIAGNOSIS >

ABS WARNING LAMP

Description

INFOID:000000001341896

	X: 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:000000001341897
.CHECK ABS WARNING LAMP OPERATION	
Check that the lamp illuminates for approximately 1 s	econd after the ignition switch is turned ON.
s the inspection result normal?	
YES >> INSPECTION END NO >> Go to diagnosis procedure. Refer to <u>BRC</u>	-37 "Diagnosis Procedure"
Diagnosis Procedure	INFO/D:000000001341898
.CHECK SELF-DIAGNOSIS	
Perform ABS actuator and electric unit (control unit)	self-diagnosis. Refer to BRC-12, "CONSULT-III Function
ABS)".	
s the inspection result normal?	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis.	
CHECK COMBINATION METER	
Check if the indication and operation of combination r	meter are normal Refer to MWI-4 "Work Flow"
s the inspection result normal?	
YES >> Replace ABS actuator and electric unit (c	control unit).
NO >> Repair or replace combination meter.	

Ο

Ρ

[ABS]

BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

BRAKE WARNING LAMP

Description

INFOID:000000001341899

×: 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:000000001341900

INFOID:000000001341901

1.BRAKE WARNING 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 <u>BRC-38</u>, "Diagnosis Procedure".

2.BRAKE WARNING LAMP OPERATION CHECK 2

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake lever (M/T models) or the parking brake pedal (CVT models).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check parking brake switch. Refer to <u>BRC-195. "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.CHECK PARKING BRAKE SWITCH

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake lever (M/T models) or the parking brake pedal (CVT models).

Is the inspection result normal?

YES >> GO TO 2

NO >> Check parking brake switch. Refer to <u>BRC-195, "Diagnosis Procedure"</u>.

2. CHECK SELF-DIAGNOSIS

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

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 <u>MWI-4, "Work Flow"</u>. <u>Is the inspection result normal?</u>

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace combination meter.

< ECU DIAGNOSIS >

ECU DIAGNOSIS ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000001341902

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.

		Data monitor					
Monitor item	Display content	Condition	Reference value in normal operation				
FR LH SENSOR		0 [km/h]	Vehicle stopped				
FR RH SENSOR RR LH SENSOR RR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10 % or less)	Vehicle running (Note 1)				
STOP LAMP SW	Brake pedal operation	When brake pedal is de- pressed	ON				
STOP LAIVIP SW		When brake pedal is not depressed	OFF				
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V				
		P position	Р				
SLCT LVR POSI	A/T shift position	R position	R				
		N position	N				
		D position	D				
PARK BRAKE SW	Parking brake switch	Parking brake switch is active	ON				
	Parking brake switch	Parking brake switch is inactive	OFF				
FR LH IN SOL FR LH OUT SOL FR RH IN SOL FR RH OUT SOL	Operation status of all solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or ac- tuator relay is inactive (in fail-safe mode)	ON				
RR LH IN SOL RR LH OUT SOL RR RH IN SOL RR RH OUT SOL		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (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 operat- ing	OFF				
ACTUATOR RLY	Actuator roley exercition	When the actuator relay is operating	ON				
(Note 2)	Actuator relay operation	When the actuator relay is not operating	OFF				
	ABS warning lamp	When ABS warning lamp is ON	ON				
ABS WARN LAMP	(Note 3)	When ABS warning lamp is OFF	OFF				
		ABS is active	ON				
ABS SIGNAL	ABS operation	ABS is inactive	OFF				



[ABS]

А

С

< ECU DIAGNOSIS >

[ABS]

		Data mo	nitor	
Monitor item	Display content	Condition	Reference value in normal operation	
	ABS fail-safe signal	In ABS fail-safe	ON	
ABS FAIL SIG		ABS is normal	OFF	

Note 1: Confirm tire pressure is normal.

Note 2: A brief moment of ON/OFF condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

Note 3: On and off timing for warning lamp and indicator lamp.Refer to BRC-12, "CONSULT-III Function (ABS)".

< ECU DIAGNOSIS >

[ABS]



< ECU DIAGNOSIS >



[ABS]

AWFIA0087GB

H.S.

佢

H.S.

f





I ī

Т I.



E26

Connector No.









Signal Name	I	I	I	I	I	
Color of wire	Ч	Γ	0	L	٩	
Terminal No.	8G	15G	34G	51G	52G	

Connector Name STOP LAMP SWITCH (WITH CVT)

Connector No. E38

WHITE

Connector Color

_ _ -Т

3 4 1 2

H.S.

佢



< ECU DIAGNOSIS >

AWFIA0088GB

< ECU DIAGNOSIS >

[ABS]



< ECU DIAGNOSIS >

Wiring Diagram - Sedan



< ECU DIAGNOSIS >

[ABS]



< ECU DIAGNOSIS >



E22	Connector Name JOINT CONNECTOR-E04	HITE] 4 3 2 1]	f Signal Name	I	1
	l J	lor M		Color o Wire	٩	٦
Connector No.	Connector Na	Connector Color WHITE	र्षोजे H.S.	Terminal No. Wire	~	4
	NT CONNECTOR-E03	TE	3 2 1 1	Signal Name	I	I
Connector No. E21	Connector Name JOINT CONNECTOR-E03	Connector Color WHITE		Terminal No. Color of Signal Name		

3 2 1 0	Signal Nam
	Color of
, có	inal No.

Signal Name	I	I	
Color of Wire	_	_	
minal No.	2	4	

ALFIA0032GB

inc	22	SIS	>																									<u> </u>	BS]
TO WIRE			321	2 11 10 9 8				Signal Name	I	I	1	I				STOP LAMP SWITCH	CVT)		Г				Signal Name	1	1				
me WIRE	NHITE		7 6 5 4 1	16 15 14 13 12 11 10 9			Color of	Wire	R/W	B/R	۲	W/R			E 38			lor WHITE		3 4	-	-	Color of wire	Y/R	R/G				
Connector Name WIRE TO WIRE	Connector Color WHITE		E		ò			Terminal No.	4	5	13	14			Connector No	Connector Name		Connector Color	é		H.S.		Terminal No.	-	N				ĺ
Signal Name	DS FL	DP RL	DP RR	DP FR	DS FR	DIAG-K	CAN-L	DP FL	DS RL	IGN	DS RR	BLS	CAN-H			Signal Name	I	I	I	I	I								
wire	œ	۲	W/R	в	×	0	Ч	σ	R/W	GR	B/R	P/B	_		Color of	Wire	٩	_	0	_	٩								
Terminal No.	£	9	8	6	10	÷	15	16	17	18	19	20	26			No	86	15G	34G	51G	52G								
								4 P							Г			1											
	ELECTRIC UNIT (CONTROL							10 11 12 22 23 24 10 11 12 13			Signal Name	MGND	UB (MR)	UB (VR) GND		RE				3 96		0 200 346	6 496 506	576 586 616 626 636	G 720 G 730 806				
	ECTRIC UN	(LI)	BLACK				17 40 40	6 7 8 9	-			Σ	Ε	5		WIRE TO WIRE	WHITE			3G 4G 5G 6G 7G 8G 1G 2G 100 116 126 136 146156	20 010 000 000 010 000	180 196 276 286 286 289 289 289 289 289 289 289 289 289 289	426 436 446 456 466 476 486 496	526 536 546 596 606 616	686 676 686 695 706 716 726 646 656 736 746 755 766 776 786 795	6 826 83			
						[3 4 5		Color c	No. Wire	в	G/R	B/B B	F	le le		-		16 26		186 196	426	516 520	64G 65G	816	ļ		
Connector Name			Connector Color	ą		H.S.		1 2			Terminal No.	-	N	ω 4	Concernant No.	Connecto	Connecto		f	SН		l		•					

< ECU DI

Ρ

AWFIA0141GB

< ECU DIAGNOSIS >



ALFIA0034GB

INFOID:000000001341904

ABS SYSTEM

Fail-Safe

In case of electrical malfunctions with ABS, the ABS warning lamp will turn on. Simultaneously, the ABS switches to the fail-safe mode.

 In case of a malfunction with ABS, the result of a fail-safe mode will be normal braking without the aid of ABS.
 NOTE:

ABS]

< ECU DIAGNOSIS >

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition switch ON" and "The first starting" are being performed.

CAUTION:

If the Fail-Safe function is activated, then perform self-diagnosis for ABS control system.

DTC No. Index

INFOID:000000001341905

[ABS]

А

С

CAUTION:

If the Fail-Safe function is activated, then perform self-diagnosis for VDC/TCS/ABS control system.

Display item	Malfunction detecting condition	Check item	-
RR RH SENSOR-1 [C1101] ^{*1}	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is out- side the standard.		D
RR LH SENSOR-1 [C1102] ^{*1}	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	BRC-16, "Diagno- sis Procedure"	E
FR RH SENSOR-1 [C1103] ^{*1}	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is out- side the standard.	(Note 1)	
FR LH SENSOR-1 [C1104] ^{*1}	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.		BRC
RR RH SENSOR-2 [C1105] ^{*1}	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.		G
RR LH SENSOR-2 [C1106] ^{*1}	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.	BRC-19, "Diagno-	Н
FR RH SENSOR-2 [C1107] ^{*1}	When the circuit in the front RH wheel sensor is short-circuited. Or when the dis- tance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	sis Procedure" (Note 1)	I
FR LH SENSOR- 2 [C1108] ^{*1}	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.		J
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-22, "Diagno- sis Procedure"	K
CONTROLLER FAILURE [C1110] ^{*2}	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-24, "Diagno- sis Procedure"	
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.	BRC-25, "Diagno-	L
[C1111]	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	sis Procedure"	Μ
MAIN RELAY	During the actuator relay operating with OFF, when the actuator relay turns ON. Or when the control line for the relay is shorted to the ground.	BRC-27, "Diagno-	
[C1114]	During the actuator relay operating with ON, when the actuator relay turns OFF, or when the control line for the relay is open.	sis Procedure"	Ν
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input signal is malfunctioning.	BRC-29, "Diagno- sis Procedure" (Note 1)	0
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-32, "Diagno- sis Procedure"	_ P
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"	_
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-32, "Diagno- sis Procedure"	_
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"	_

< ECU DIAGNOSIS >

Display item	Malfunction detecting condition	Check item
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	BRC-32, "Diagno- sis Procedure"
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-32, "Diagno- sis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-34, "Diagno- sis Procedure"
CAN COMM CIRCUIT [U1000] ^{*3}	When there is a malfunction in the CAN communication circuit.	BRC-36, "Diagno- sis Procedure"

*1: Be sure to confirm the ABS warning lamp illuminates when the ignition switch is turned ON after repairing the shorted sensor circuit, but the lamp turns off when driving the vehicle over 30 km/h (19 MPH) for approximately 1 minute in accordance with SELF-DIAGNOSIS PROCEDURE.

*2: When "CONTROLLER FAILURE" is displayed, check to see if the ABS warning lamp is burned out, and check the circuit between the ABS warning lamp and ABS actuator and electric unit (control unit) for open or short. Then, check the ABS actuator and electric unit (control unit) and circuit.

*3: When malfunctions are detected in several systems, including CAN communication circuit [U1000], troubleshoot CAN communiation circuit first. Refer to LAN-7, "System Description".

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 fre- quency	Looseness of front and rear axle	BRC-54, "Diagno- sis Procedure"
4	Wheel sensor and rotor system	<u></u>
Linexpected pedal reaction	Brake pedal stroke	BRC-55, "Diagno-
Unexpected 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-56, "Diagno- sis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-57, "Diagno- sis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-58, "Diagno-
occurs (Note 2)	ABS actuator and electric unit (control unit)	sis Procedure"

ABS

NOTE:

• 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.

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

BRC-53

- 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]

А

[ABS]

- Н
- K

L

Μ

Ν

Ο

Ρ

J

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:000000001341907

[ABS]

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-7</u>, "<u>Removal and Installation</u>", Rear: <u>RAX-6</u>, "<u>Removal and Installation</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.
 - Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

- YES >> Normal
- NO >> Perform self-diagnosis. Refer to <u>BRC-9, "System Description"</u>.

UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS > [ABS]	
UNEXPECTED PEDAL REACTION	Δ
Diagnosis Procedure	A
1.CHECK BRAKE PEDAL STROKE	В
Check brake pedal stroke. Refer to BRC-9, "System Description".	
Is the stroke too big?	-
 YES >> • Bleed air from brake tube and hose. Refer to <u>BR-15, "Bleeding Brake System"</u>. • Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: <u>BR-41, "Brake Pedal"</u>, brake booster and master cylin- 	С
der: <u>BR-41, "Brake Booster"</u> . NO >> GO TO 2	D
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.	E
Is the inspection result normal?	
YES >> GO TO procedure 3 "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom 1. Refer to BRC-53, "Symptom Table".	BRC

NO >> Check brake system.

L

G

Н

I

J

Κ

M

Ν

0

Ρ

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:000000001341909

[ABS]

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 >> GO TO procedure 3 "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom 1. Refer to <u>BRC-53, "Symptom Table"</u>.
- NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

< SYMPTOM	DIAGNOSIS >	

NO

[ABS]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure	INFOID:000000001341910
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 drive	/ing.
Is the inspection result normal?	
YES >> GO TO procedure 3 "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symp	ptom 1. Refer to
BRC-53, "Symptom Table".	

>> Perform self-diagnosis. Refer to <u>BRC-12, "CONSULT-III Function (ABS)"</u>.

Ε

А

В

С

D

BRC

G

Н

J

Κ

L

Μ

Ν

Ο

Ρ

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:000000001341911

[ABS]

CAUTION:

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

- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [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 if there is pedal vibration or operation sound when the engine is started.

Do symptoms occur?

YES >> GO TO 2

NO >> Perform self -diagnosis. Refer to <u>BRC-12, "CONSULT-III Function (ABS)"</u>.

2.SYMPTOM CHECK 2

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 >> GO TO procedure 3 "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom 1. Refer to BRC-53, "Symptom Table".

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

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 ABS activa- tion.
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 a normal, and it is caused by the ABS op-

Е

D

G

Н

J

Κ

[ABS]

INFOID:000000001341912

eration check.

А

В

С

L

Μ

Ν

Ο

Ρ

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

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

- Recommended fluid is brake fluid "DOT 3".
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted surface of body. If brake fluid is splashed on painted surfaces of body immediately wipe off then with cloth and then wash it away with water.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect connectors of ABS actuator and electric unit (control unit) or the battery cable from the negative terminal.

WARNING:

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

Precaution for Brake Control



INFOID:000000001341915

INFOID:000000001341914

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



PRECAUTIONS

PRECAUTION >	[ABS]
parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement- (roll bar, tower bar, etc.).	-related parts
When driving with worn or deteriorated suspension, tires and brake-related parts.	

0

Ρ

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
 (J-45741) ABS active wheel sensor tester	VFIA0101E	Checking operation of ABS active wheel sen- sor

Commercial Service Tool

INFOID:000000001341917

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

INFOID:000000001341916

WHEEL SENSORS

< ON-VEHICLE REPAIR >

ON-VEHICLE REPAIR WHEEL SENSORS

Removal and Installation

INFOID:000000001341919

А

В

J

Κ

L

 SEC. 476
 Image: Comparison of the sensor of the sensecon of the sensor of the sensor of the sen

CAUTION:

- Be careful not to damage wheel sensor edge and sensor rotor teeth.
- When removing the front or rear wheel hub assembly, first remove the wheel sensor from the assembly. Failure to do so may result in damage to the wheel sensor wires making the sensor inoperative.
 CAUTION:
- Pull out the wheel sensor, being careful to turn it as little as possible. Do not pull on the wheel sensor harness.
- Installation should be performed while paying attention to the following, and then tighten bolts and nuts to the specified torque.
- Check if foreign objects such as iron fragments are adhered to the pick-up part of the sensor or to the inside of the hole for the wheel sensor, or if a foreign object is caught in the surface of the mating surface for the rotor. If something wrong is found, fix it and then install the wheel sensor.

REMOVAL

Fror	nt	Μ
1.	Remove wheel and tire using power tool.	
2.	Partially front wheel fender protector. Refer to EXT-19, "Removal and Installation".	
3.	Remove wheel sensor bolt and wheel sensor.	Ν
4.	Remove harness wire from mounts and disconnect wheel sensor harness connector.	
Rea NO	ır TE:	0
Bot	h rear wheel sensors share one harness and must be replaced as an assembly.	
1.	Remove wheel and tire using power tool.	
2.	Remove wheel sensor bolts and wheel sensors from both rear wheels.	Ρ
3.	Remove harness wire from mounts and harness wire clips from suspension member.	

WHEEL SENSORS

< ON-VEHICLE REPAIR >

4. Disconnect wheel sensor harness connector (1).



INSTALLATION

Installation is in the reverse order of removal.

• When installing wheel and tire, refer to WT-35, "Inspection".

[ABS]

< ON-VEHICLE REPAIR >

SENSOR ROTOR

Removal and Installation

The front and rear wheel sensor rotors are an integral part of the wheel hub assemblies and can not be disassembled. When replacing the sensor rotor, replace the wheel hub assembly. Refer to FAX-7, "Removal and Installation" (Front), RAX-6, "Removal and Installation" (Rear).

BRC

G

Н

J

Κ

L

Μ

Ο

Ρ

INFOID:000000001341920

А

В

С

D

Е

< ON-VEHICLE REPAIR >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

COMPONENT

INFOID:000000001341921



1. From master cylinder secondary side 2. From master cylinder primary side

To rear LH brake caliper

Grommet

8.

- 5. To front LH brake caliper
 - To front RH brake caliper
- 3. Bracket
- 6. To rear RH brake caliper
- ABS actuator and electric unit 9.

INFOID:000000001341922

Front 6

4.

7.

Removal and Installation

REMOVAL

CAUTION:

- Be careful of the following.
- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut torque wrench.
- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Do not remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to <u>BR-15, "Bleeding Brake System".</u>

BRC-66

[ABS]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [ABS] < ON-VEHICLE REPAIR > 1. Remove front wiper arms. Refer to WW-40, "FRONT WIPER ARMS : Removal and Installation". А 2. Remove cowl top. Refer to EXT-18, "Removal and Installation". Disconnect washer hose. 4. Remove tower bar, if equipped. Refer to FSU-11, "Exploded View". В 5. Disconnect ABS actuator and electric unit (control unit) connector. 6. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit). 7. Remove ABS actuator and electric unit (control unit) nuts. С 8. Remove ABS actuator and electric unit (control unit) from vehicle. 9. Remove bracket as necessary. D INSTALLATION CAUTION: Be careful of the following. • Before servicing, disconnect the battery cable from negative terminal. Е To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut torque wrench. Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it. BRC Do not remove and install actuator by holding harness. After work is completed, bleed air from brake tube. Refer to BR-15, "Bleeding Brake System". After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked. Installation is in the reverse order of removal.

Н

Κ

L

Μ

Ν

Ρ

< BASIC INSPECTION >

BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001341923

[TCS/ABS]

DESCRIPTION

Basic Concept

- The most important point to perform trouble diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.
- It is also important to clarify customer complaints before inspection.

First of all, reproduce symptom, and understand it fully.

Ask customer about his/her complaints carefully. In some cases, they will be necessary to check symptom by driving vehicle with customer.

CAUTION:

Customers are not professionals. Do not assume "maybe customer means..." or "maybe customer mentioned this symptom".

• It is essential to check symptoms right from beginning in order to repair a malfunction completely.

For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.

- After diagnostic, make sure to perform "ERASE MEMORY". Refer to <u>BRC-76, "CONSULT-III Function (ABS)"</u>.
- Always read "GI General Information" to confirm general precautions. Refer to <u>GI-28, "General Precautions"</u>.

Asking Complaints

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use diagnostic sheet so as not to miss information.







DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[TCS/ABS]



Ρ

Ľ

< BASIC INSPECTION >

Diagnostic Work Sheet

INFOID:000000001341924

[TCS/ABS]

DIAGNOSIS AND REPAIR WORKFLOW

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

SFIA0791E

FUNCTION DIAGNOSIS TCS

System Diagram



TCS

- ABS Warning lamp indicator 7. (combination meter)
- 10. Rear LH wheel sensor
- SLIP indicator lamp 8. (combination meter)

System Description

CAUTION:

1.

4.

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

ABS/EBD SYSTEM

In case of an electrical malfunction with the ABS, the ABS warning 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 and SLIP indicator lamp will turn on.

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/TCS 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/TCS or EBD system.

TCS SYSTEM

In case of TCS system malfunction, the SLIP indicator lamp is turned on and the condition of the vehicle is the same as the condition of vehicles without TCS system. In case of an electrical malfunction with the TCS system, the ABS control continues to operate normally without TCS control.

BRC-71

А

Ε

BRC

Н

Κ

L

M

Ν

INFOID:000000001341926

(combination meter)

INFOID:000000001341925

< FUNCTION DIAGNOSIS >

PURPOSE

The Anti-lock Brake System (ABS) consists of electronic and hydraulic components. It allows for control of braking force so that locking of the wheels can be avoided.

The ABS:

- Ensures proper tracking performance through steering wheel operation.
- Enables obstacles to be avoided through steering wheel operation.
- Enables vehicle stability by preventing flat spins.

OPERATION

- When the vehicle speed is less than 10 km/h (6 MPH) this system does not work.
- The ABS has self-test capabilities. The system turns on the ABS warning lamp for 2 seconds after turning the ignition switch ON. The system performs another test the first time the vehicle reaches 6 km/h (4 MPH). A mechanical noise may be heard a sthe ABS performs a self-test. This is a normal part of the self-test feature. If a malfunction is found during this check, the ABS warning lamp will come on.
- During ABS operation, a mechanical noise may be heard. This is a normal condition.

FAIL SAFE

If trouble occurs in the ABS or TCS, the ABS warning lamp in the combination meter comes on. At the same time, the vehicle stops the ABS control and braking becomes the same as that of a vehicle without ABS.

ABS FUNCTION

- The Anti-Lock Brake System detects wheel revolution while braking and improves handling stability during sudden braking by electrically preventing wheel lockup. Maneuverability is also improved for avoiding obstacles.
- If the electrical system malfunctions, the Fail-Safe function is activated, the ABS becomes inoperative and the ABS warning lamp turns on.
- The electrical system can be diagnosed using CONSULT-III.
- During ABS operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is normal.
- Just after starting the 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.

EBD FUNCTION

- Electronic Brake Distribution is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the brake fluid pressure which results in reduced rear wheel slippage.
- If the electrical system malfunctions, the Fail-Safe function is activated, the EBD and ABS become inoperative, and the ABS warning lamp and BRAKE warning lamp are turned on.
- The electrical system can be diagnosed using CONSULT-III.
- During EBD operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is normal.
- Just after starting the 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 EBD when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

TCS FUNCTION

- Spinning of the drive wheels is detected by the ABS/TCS control unit using inputs from the wheel speed sensors. If wheel spin occurs, the drive wheel right and left brake fluid pressure control and engine fuel cut are conducted while the throttle value is restricted to reduce the engine torque and decrease the amount of wheel spin. In addition, the throttle opening is controlled to achieve the optimum engine torque.
- Depending on road condition, the vehicle may have a sluggish feel. This is normal, because optimum traction has the highest priority during TCS operation.
- TCS may be activated during sudden vehicle acceleration, wide open throttle acceleration, sudden transmission shifts or when the vehicle is driven on a road with a varying surface friction coefficient.
- The SLIP indicator lamp flashes to inform the driver of TCS operation.

WHEEL SENSORS
< FUNCTION DIAGNOSIS >

The front sensor units consist of a gear-shaped sensor rotor and a sensor element. The element contains a magnet around which a coil is wound. The front wheel sensors are installed on the front of the wheel knuckles. As the wheel rotates, the sensor generates a square-wave signal. The frequency increases as the wheel speed increases.

The rear sensor units consist of wheel hubs with a series of internal magnets and a sensor element. The rear wheel sensors are installed on the inner side of the wheel knuckles. As the wheel rotates, the sensor generates a square-wave signal. The frequency increases as the wheel speed increases.

ELECTRICAL COMPONENTS



TCS



[TCS/ABS]

А

В

Ν

Ρ

Control unit

Sensor

Magnet

\ V+

SIG,

Magnetic

IC

flux

< FUNCTION DIAGNOSIS >

HYDRAULIC CIRCUIT DIAGRAM



TCS

OPERATION THAT IS NOT "SYSTEM ERROR"

ABS/TCS

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

CAN Communication Refer to <u>LAN-7, "System Description"</u>.

Component Parts Location

[TCS/ABS]

INFOID:000000001341927

А

В

С

D

Е

BRC

G

Н

J

Κ

L

Μ

Ν

Ο

Ρ





AWFIA0182GB

TCS

< FU	NCTION DIAGNOSIS >			[TCS/ABS	
1.	Front wheel sensor RH E41	2.	ABS actuator and electric unit (control unit) E26 (engine removed for clarity)	3.	Rear wheel sensor RH B43
4.	Rear wheel sensor LH B43	5.	Combination meter M24 a: US models b: Canada models c: US models d: Canada models	6.	TCS ON/OFF switch M72
7	Front wheel sensor I H E19				

Front wheel sensor LH E19

Component Description

INFOID:000000001341928

Compo	nent parts	Reference
	Pump	PPC 00 "Description"
ADC activator and algorithmusik (constrainusik)	Motor	BRC-90, "Description"
ABS actuator and electric unit (control unit)	Actuator relay (Main relay)	BRC-92, "Description"
	Solenoid valve	BRC-97, "Description"
Wheel sensor		BRC-81, "Description"
TCS OFF switch		BRC-105, "Description"
ABS warning lamp		BRC-103, "Description"
Brake warning lamp		BRC-104, "Description"

CONSULT-III Function (ABS)

SELF-DIAGNOSIS RESULTS

Operation Procedure

- Turn ignition switch ON. 1.
- 2. Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
- After stopping vehicle, with the engine running, touch "ABS", "SELF-DIAG RESULTS" in order on the 3. CONSULT-III screen.
- The self-diagnostic results are displayed. 4.
 - Check ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn off. If "NO FAILURE" is displayed, refer to BRC-103, "Description".
- 5. Perform the appropriate inspection from display item list, and repair or replace the malfunctioning component.Refer to "Display Item List".
- Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute. 6. CAUTION:

When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning 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.

Erase Memory

- Turn ignition switch OFF. 1.
- 2. Start engine and touch "ABS", "SELF-DIAG RESULTS", "ERASE MEMORY" in order on the CONSULT-III screen to erase the diagnostic memory. If "ABS" is not indicated, go to GI-50, "Description". CAUTION:

If the diagnostic memory is not erased, re-perform the operation from step 6 above.

- 3. Perform self-diagnosis again, and make sure that diagnostic memory is erased.
- 4. 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, TCS OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn off.

BRC-76

TCS

INFOID:000000001341929

< FUNCTION DIAGNOSIS >

• Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or with brake fluid level switch operation (when brake fluid is insufficient).

TCS

• TCS OFF switch should not stay in the "ON" position.

Display Item List

Display item	Malfunction detecting condition	Check item	D
RR RH SENSOR-1 [C1101]	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.		С
RR LH SENSOR-1 [C1102]	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.		
FR RH SENSOR-1 [C1103]	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.		D
FR LH SENSOR-1 [C1104]	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.		E
RR RH SENSOR-2 [C1105]	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.	BRC-81, "Diagno- sis Procedure" (Note)	BRC
RR LH SENSOR-2 [C1106]	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.		
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the dis- tance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	-	G
FR LH SENSOR- 2 [C1108]	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.	-	Н
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-87, "Diagno- sis Procedure"	
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-89, "Diagno- sis Procedure"	J
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.	BRC-90, "Diagno-	K
[C1111]	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	sis Procedure"	1 %
MAIN RELAY [C1114]	Actuator solenoid valve relay is ON, even if control unit sends OFF signal. Actuator solenoid valve relay is OFF, even if control unit sends ON signal.	BRC-92, "Diagno- sis Procedure"	L
ABS SENSOR [C1115]	Teeth damage on sensor rotor or improper installation of wheel sensor.	BRC-94, "Diagno- sis Procedure"	- M
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-97, "Diagno- sis Procedure"	
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-99, "Diagno- sis Procedure"	Ν
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-97, "Diagno- sis Procedure"	- 0
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-99, "Diagno- sis Procedure"	0
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	BRC-97, "Diagno- sis Procedure"	Ρ
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-99, "Diagno- sis Procedure"	_
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-97, "Diagno- sis Procedure"	_
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-99, "Diagno- sis Procedure"	_

А

В

< FUNCTION DIAGNOSIS >

[TCS/ABS]

Display item	Malfunction detecting condition	Check item
ENGINE SIGNAL 1 [C1130]	Fuel cut control abnormal.	
ENGINE SIGNAL 2 [C1131]	Electric throttle control abnormal.	BRC-101, "Diagno-
ENGINE SIGNAL 3 [C1132]	ECM CAN communication abnormal.	sis Procedure"
ENGINE SIGNAL 4 [C1133]	ECM communication to ABS actuator and electric unit (control unit) abnormal.	
CAN COMM CIRCUIT [U1000]	When there is a malfunction in the CAN communication circuit.	BRC-102, "Diagno- sis Procedure"

Note: After completing repairs of shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Make sure that ABS warning lamp turns off while driving vehicle at 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for wheels, check wheel sensor circuit and also check control unit power voltage.

DATA MONITOR

Display Item List

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.

Item	Data	monitor item sele	ection	
(Unit)	ECU INPUT SIGNALS	MAIN SIG- NALS	SELECTION FROM MENU	Remarks
FR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
RR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (con- trol unit) is displayed.
GEAR	×	×	×	Gear position judged by PNP switch signal is displayed.
SLCT LVR POSI	×	×	×	Shift position judged by PNP switch signal.
OFF SW (ON/OFF)	×	×	×	TCS OFF switch (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.
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.

BRC-78

[TCS/ABS]

J

Κ

L

< FUNCTION DIAGNOSIS >

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.
ABS WARN LAMP (ON/OFF)	_	×	×	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	—	×	×	TCS OFF lamp (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	_	×	×	SLIP indicator lamp (ON/OFF) status is displayed.

×: Applicable

-: Not applicable

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

ACTIVE TEST

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, TCS indicator lamp, SLIP indicator H lamp and brake warning lamp are on.
- ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp and brake warning lamp are on during active test.

Operation Procedure

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" to restart the process.

Solenoid Valve

NOTE:

The example shown is for front right wheel. The procedure for the other wheels is the same as given below.

- 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 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 (IN, OUT) operate as shown in the table below.

Operation	ABS solenoid valve			ABS solenoid valve (ACT)		
(Note)	UP	KEEP	DOWN	UP	ACT UP	ACT KEEP
FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF

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

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

ABS Motor

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

BRC-79

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY (Note)	ON	ON

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

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 DETECTION LOGIC

Description

DTC 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 CC	ONFIRMATION PROCE	DURE	
1.снес	CK SELF-DIAGNOSIS RE	SULTS	
Check th	ne self-diagnosis results.		
	Self-diagnosis		
	RR RH SENS		
	RR LH SENS		
	FR RH SENS		
	FR LH SENS		
	displayed on the self-diag		
YES NO	>> INSPECTION END	procedure. Refer to <u>BRC-81, "Diagnosis Proced</u>	<u>ure</u> .
-	nfirmation Procedure		
Diagno	osis Procedure		INFOID:000000001341932
CAUTIO	NI-		
	check between wheel se	nsor terminals.	
INSPEC	TION PROCEDURE		
1. CHE	CK CONNECTOR		
functioni	ing wheel sensor connecto	onnect ABS actuator and electric unit (control unit for E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and , loose, etc., Repair or replace it if any malfuncti	RR-LH). Check terminal to
Is the ins	spection result normal?		
	>> GO TO 2		
YES		0000000	
NO	>> Repair or replace as n CK WHEEL SENSOR OU ⁻	-	

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

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

INFOID:000000001341930

INFOID:000000001341931

[TCS/ABS]

D

А

В

С

BRC-81

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[TCS/ABS]

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace wheel sensor. Refer to <u>BRC-133, "Removal and Installation"</u>.

3.CHECK TIRE

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

YES >> GO TO 4 NO >> • Adjust a

>> • Adjust air pressure, or replace tire.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5, "Inspection"</u> (front) or <u>RAX-5, "On-vehicle Service"</u> (rear). <u>Is the inspection result normal?</u>

- YES >> GO TO 5
- NO >> Repair or replace as necessary. Refer to <u>FAX-7, "Removal and Installation"</u> (front) or <u>RAX-6,</u> <u>"Removal and Installation"</u> (rear).
- **5.**CHECK WHEEL SENSOR HARNESS
- Turn ignition switch OFF and disconnect malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH) and ABS actuator and electric unit (control unit) connector E26.
- 2. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)



	Power sup	oply circuit	Signal circuit		Ground circuit		
Wheel	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (Signal - Ground) (A)	ABS actuator and electric unit (control unit) (A) (Signal) - Body Ground	
Front RH	9	1	10	2	9, 10 - 1, 4	9, 10 - Body ground	
Front LH	16	1	5	2	16, 5 - 1, 4	16, 5 - Body ground	
Rear RH	8	3	19	4	8, 19 - 1, 4	8, 19 - Body ground	
Rear LH	6	1	17	2	6, 17 - 1, 4	6, 17 - Body ground	

Power supply circuit

- : Continuity should exist.
- : Continuity should exist.
- Signal circuit Ground circuit
- : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> • Repair or replace malfunctioning components.

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[TCS/ABS]

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

6.CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- Reconnect ABS actuator and electric unit (control unit) connector.
- 2. Turn ignition switch ON and check between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH (A)			
Front LH (A)	1		8 V or more
Rear LH (B)		_	8 V 01 more
Rear RH (B)	3		



Is the inspection result normal?

YES >> Inspection end.

NO >> Replace ABS actuator and electric unit (control unit).

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	Nearly matches the speedometer dis- play (±10% or less)
FR RH SENSOR	
RR LH SENSOR	
RR RH SENSOR	
Is the inspection result normal?	

BRC-83

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-81, "Diagnosis Procedure"</u>.

BRC

Н

Κ

L

Μ

Ν

Ρ

INFOID:000000001341933

А

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

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

INFOID:000000001341935

INFOID:000000001341934

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1106	RR LH SENSOR-2	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	Harness or connectorWheel sensor
C1107	FR RH SENSOR-2	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)
C1108	FR LH SENSOR-2	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-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-84, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CHECK CONNECTOR

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26 and malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH). Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Disconnect connectors from wheel sensor of malfunction code No.

- 2. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- 3. 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.

INFOID:000000001341936

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS > [TCS//	ABS]
4. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active v sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal. NOTE:	wheel
If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads retest.	s and
Does the ABS active wheel sensor tester detect a signal?	
YES >> GO TO 3 NO >> Replace wheel sensor. Refer to <u>BRC-133, "Removal and Installation"</u> .	
3.CHECK TIRE	
Check air pressure, wear and size.	
Are air pressure, wear and size within standard?	
 YES >> GO TO 4 NO >> • Adjust air pressure, or replace tire. • Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED" 	¹⁹ .
4.CHECK WHEEL BEARINGS	
Check wheel bearing axial end play. Refer to FAX-5, "Inspection" (front) or RAX-5, "On-vehicle Service" (r	rear).
Is the inspection result normal?	
 YES >> GO TO 5 NO >> Repair or replace as necessary. Refer to <u>FAX-7, "Removal and Installation"</u> (front) or <u>R.</u> <u>"Removal and Installation"</u> (rear). 	<u>AX-6,</u>
5. CHECK WHEEL SENSOR HARNESS	

J.CHECK WHEEL SENSOR HARNESS

- 1. Turn ignition switch OFF and disconnect malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH) and ABS actuator and electric unit (control unit) connector E26.
- 2. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)



Н

J

Κ

Ρ

	Power sup	oply circuit	Signal	circuit	G	round circuit
Wheel	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (Signal - Ground) (A)	ABS actuator and electric unit (control unit) (A) (Signal) - Body Ground
Front RH	9	1	10	2	9, 10 - 1, 4	9, 10 - Body ground
Front LH	16	1	5	2	16, 5 - 1, 4	16, 5 - Body ground
Rear RH	8	3	19	4	8, 19 - 1, 4	8, 19 - Body ground
Rear LH	6	1	17	2	6, 17 - 1, 4	6, 17 - Body ground

Power supply circuit Signal circuit **Ground circuit**

: Continuity should exist.

: Continuity should exist.

: Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

- >> Repair or replace malfunctioning components. NO
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

BRC-85

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

6.CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- Reconnect ABS actuator and electric unit (control unit) connector.
- 2. Turn ignition switch ON and check between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH (A)			
Front LH (A)	1		8 V or more
Rear LH (B)		_	8 V 01 11010
Rear RH (B)	3		



Is the inspection result normal?

YES >> Inspection end.

NO >> Replace ABS actuator and electric unit (control unit).

Component Inspection

INFOID:000000001341937

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-84, "Diagnosis Procedure"</u>.

DTC C1109 BATTERY VOLTAGE [ABNORMAL] А Description INFOID:000000001341938 Supplies electric power to the ABS actuator and electric unit (control unit). В DTC Logic INFOID:000000001341939 DTC DETECTION LOGIC DTC Malfunction detected condition Possible cause Display item D Harness or connector BATTERY VOLTAGE When the ABS actuator and electric unit (control unit) C1109 ABS actuator and electric unit [ABNORMAL] power supply voltage is lower than normal. (control unit) Е DTC CONFIRMATION PROCEDURE 1.CHECK SELF-DIAGNOSIS RESULTS Check the self-diagnosis results. BRC Self-diagnosis results BATTERY VOLTAGE [ABNORMAL] Is above displayed on the self-diagnosis display? YES >> Proceed to diagnosis procedure. Refer to <u>BRC-87, "Diagnosis Procedure"</u>. Н >> INSPECTION END NO **Diagnosis** Procedure INFOID:000000001341940 INSPECTION PROCEDURE **1.**CHECK CONNECTOR 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal. Κ Reconnect connector and perform self-diagnosis. 2. Is the inspection result normal? >> INSPECTION END YES NO >> GO TO 2 2.check abs actuator and electric unit (control unit) power supply circuit and **GROUND CIRCUIT** Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26. 1. Check voltage between ABS actuator and electric unit (control 2. unit) harness connector E26 terminal 18 and ground. Ν

DTC C1109 BATTERY VOLTAGE [ABNORMAL] < COMPONENT DIAGNOSIS >

BRC-87

[TCS/ABS]

- Μ

Ρ

ÔN

ALFIA0006ZZ

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

< COMPONENT DIAGNOSIS >

[TCS/ABS]

ABS actuator and electric unit (control unit)	Ground	Condition	Voltage
		Ignition switch ON	Battery voltage (Approx. 12 V)
10		Ignition switch OFF	Approx. 0 V

- 3. Turn ignition switch OFF.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4	_	Yes

Is the inspection result normal?

NO

- YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
 - >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".



DTC C1110 CONTROL FAILURE

< COMPONENT DIAGNOSIS >

DTC C1110 CONTROL FAILURE

DTC Logic

INFOID:000000001341941

DTC DETECTION LOGIC В DTC Display item Malfunction detected condition Possible cause When there is an internal malfunction in the ABS actuator • ABS actuator and electric unit C1110 CONTROLLER FAILURE and electric unit (control unit). (control unit) DTC CONFIRMATION PROCEDURE D 1.CHECK SELF-DIAGNOSIS RESULTS Check the self-diagnosis results. Ε Self-diagnosis results CONTROLLER FAILURE BRC Is above displayed on the self-diagnosis display? YES >> Proceed to diagnosis procedure. Refer to <u>BRC-89, "Diagnosis Procedure"</u>. >> INSPECTION END NO **Diagnosis** Procedure INFOID:000000001341942 INSPECTION PROCEDURE Н **1.**REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) **CAUTION:** Replace ABS actuator and electric unit (control unit) when self-diagnostic result shows items other than that applicable. >> Replace ABS actuator and electric unit (control unit). Κ L Μ Ν

Ρ

41

А

DTC C1111 PUMP MOTOR

< COMPONENT DIAGNOSIS >

DTC C1111 PUMP MOTOR

Description

INFOID:000000001341943

[TCS/ABS]

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

INFOID:000000001341944

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1111		During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for ac- tuator motor relay is open.	 Harness or connector ABS actuator and electric unit
onn		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 <u>BRC-90, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001341945

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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.

Is the inspection result normal?

YES >> Inspection end.

2. CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.

DTC C1111 PUMP MOTOR

< COMPONENT DIAGNOSIS >

 Check voltage between the ABS actuator and electric unit (control unit) harness connector E26 terminal 2 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
2	_	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3

NO

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4		Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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 (Note)	ON	ON

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-90, "Diagnosis Procedure"</u>.



ŨFF

Ð

INFOID:000000001341946

- J
- Κ

L

Ν

[TCS/ABS]

WFIA0501E

А

В

Ρ

DTC C1114 MAIN RELAY

Description

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

DTC Logic

INFOID:000000001341948

INFOID:000000001341949

INFOID:000000001341947

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1114	MAIN RELAY	During the actuator relay operating with OFF, when the actuator relay turns ON, or when the control line for the relay is shorted to the ground.	 Harness or connector ABS actuator and electric unit
		During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open.	(control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

MAIN RELAY

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-92, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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.

Is the inspection result normal?

YES >> Inspection end.

$2. {\sf CHECK} \text{ solenoid and actuator relay power supply circuit}$

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.
- 2. Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
3	—	Battery voltage (Approx. 12 V)

Is the inspection result normal?

- YES >> GO TO 3
- NO >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".



3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4	_	Yes

Is the inspection result normal?

< COMPONENT DIAGNOSIS >

- YES >> • Replace ABS actuator and electric unit (control unit).
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> • Repair or replace malfunctioning components. • Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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 2. below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY (Note)	ON	ON

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

>> Go to diagnosis procedure. Refer to BRC-92, "Diagnosis Procedure". NO



BRC

Н

Κ

L

Μ

Ν

[TCS/ABS]

INFOID:000000001341950



Ρ

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< COMPONENT DIAGNOSIS >

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

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

INFOID:000000001341952

INFOID:000000001341951

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-94, "Diagnosis Procedure"</u>.

NO >> Inspection end.

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CHECK TIRE

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

- YES >> GO TO 2
- NO >> Adjust air pressure, or replace tire.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

2.CHECK SENSOR AND SENSOR ROTOR

Check sensor rotor for damage.

• Check wheel sensor for damage, disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 3 NO >> • Repair w

>> • Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

3. CHECK CONNECTOR

- Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26 and malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH). Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-76</u>, "CONSULT-III Function (<u>ABS</u>)".

Is the inspection result normal?

YES >> Inspection end.

BRC-94

INFOID:000000001341953

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< COMPONENT DIAGNOSIS >

[TCS/ABS]

NO >> GO TO 4

4.CHECK WHEEL SENSOR HARNESS

- Turn ignition switch OFF and disconnect malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH) and ABS actuator and electric unit (control unit) connector E26.
- 2. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)



F	
-	

RC

Κ

L

Μ

Ν

Ρ

INFOID:000000001341954

D

А

В

	Power sup	oply circuit	Signal	circuit	G	round circuit	
Wheel	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (Signal - Ground) (A)	ABS actuator and electric unit (control unit) (A) (Signal) - Body Ground	BRC G
Front RH	9	1	10	2	9, 10 - 1, 4	9, 10 - Body ground	
Front LH	16	1	5	2	16, 5 - 1, 4	16, 5 - Body ground	
Rear RH	8	3	19	4	8, 19 - 1, 4	8, 19 - Body ground	H
Rear LH	6	1	17	2	6, 17 - 1, 4	6, 17 - Body ground	

Power supply circuit Signal circuit

- : Continuity should exist.
- Ground circuit
- : Continuity should not exist.

: Continuity should exist.

Is the inspection result normal?

- YES >> GO TO 5 NO >> • Repair of
 - >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

5. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- 1. Replace wheel sensor that resulted in malfunction by self-diagnosis.
- Reconnect connectors, drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is above displayed on the self-diagnosis display?

- YES >> Inspection end. NO >> • Replace ABS
 - >> Replace ABS actuator and electric unit (control unit).
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection

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)

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< COMPONENT DIAGNOSIS >

[TCS/ABS]

FR LH SENSOR

RR RH SENSOR

FR R	H SENSOR
------	----------

Nearly matches the speedometer display (±10% or less) **RR LH SENSOR**

Is the inspection result normal?

YES >> Inspection end.

NO >> Go to diagnosis procedure. Refer to <u>BRC-94, "Diagnosis Procedure"</u>.

BRC-97

< COMPONENT DIAGNOSIS > C1120, C1122, C1124, C1126 IN ABS SOL

Description

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).

Malfunction detected condition

DTC Logic

DTC

DTC DETECTION LOGIC

Display item

C1120	FR LH IN ABS SOL	When the control unit detects a malfunction in the fro LH inlet solenoid circuit.	ont	
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the from RH inlet solenoid circuit.	ABS actuator and electric unit	E
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear inlet solenoid circuit.		BRC
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the re RH inlet solenoid circuit.	ar	
DTC CC	NFIRMATION PROCE	DURE		G
1. CHEC	CK SELF-DIAGNOSIS RE	SULTS		
Check th	e self-diagnosis results.			Н
	Self-diagnosis	results		
	FR LH IN AB	SSOL		I
	FR RH IN AB	S SOL		
	RR LH IN AB	S SOL		.1
	RR RH IN AB	S SOL		0
Is above	displayed on the self-dia	anosis display?		
YES		procedure. Refer to <u>BRC-97, "Diagnosis Pro</u>	cedure".	Κ
Diagno	sis Procedure		INFOID:000000001341957	L
INSPEC	TION PROCEDURE			
1. CHEC	CK CONNECTOR			M
chec	k terminal for deformation ace terminal.	d disconnect ABS actuator and electric uni n, disconnection, looseness, and so on. If an		Ν

2. Reconnect connector and perform self-diagnosis.

Is the inspection result normal?

YES >> Inspection end.

NO >> GO TO 2

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.

[TCS/ABS]

INFOID:000000001341956

Possible cause

- А
- INFOID:000000001341955
- \sim

В

U

D

Ρ

BRC-98

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

 Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
3	—	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3

NO

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4	_	Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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.

NOTE:

The example below is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Note)		ABS solenoid valve		
	UP	KEEP	DOWN	
FR RH IN SOL	OFF	ON	ON	
FR RH OUT SOL	OFF	OFF	ON*	

*: ON for 1 to 2 seconds after the touch, and then OFF.

NOTE:

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

Is the inspection result normal?

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



ν

⊕ ∈

INFOID:000000001341958

ALFIA0007Z

DISCONNEC

LOFF

C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

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

INFOID:000000001341960

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1121	FR LH OUT ABS SOL	When the control unit detects a malfunction in the front LH outlet solenoid circuit.	ABS actuator and electric unit	
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.		E
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	(control unit)	BRC
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	
a above displayed on the solf disgraphic display?	

Is above displayed on the self-diagnosis display?

YES	>> Proceed to diagnosis procedure. Refer to <u>BRC-99, "Diagnosis Procedure"</u> .
NO	>> Inspection end.

Diagnosis Procedure

INSPECTION PROCEDURE

CHECK CONNECTOR Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal. Reconnect connector and perform self-diagnosis.

Is the inspection result normal?

YES >> Inspection end.

NO >> GO TO 2

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.

BRC-99

INFOID:000000001341959

А

В

Н

Κ

Μ

Ν

Ρ

INFOID:000000001341961

< COMPONENT DIAGNOSIS >

2. Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
3	_	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3

NO

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4		Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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.

NOTE:

The example below is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Note)	ABS solenoid valve		
Operation (Note)	UP	KEEP	DOWN
FR RH IN SOL	OFF	ON	ON
FR RH OUT SOL	OFF	OFF	ON*

*: ON for 1 to 2 seconds after the touch, and then OFF.

NOTE:

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

Is the inspection result normal?

- YES >> Inspection end.
- NO >> Go to diagnosis procedure. Refer to <u>BRC-99</u>, "Diagnosis Procedure".





INFOID:000000001341962

[TCS/ABS]

COMPONENT DIAGNOSIS >	[TCS/ABS]
C1130, C1131, C1132, C1133 ENGINE SIGNAL	
Description	INFOID:000000001341963
DTC Logic	INFOID:000000001341964
OTC DETECTION LOGIC DTC Detection Logic	
OTC CONFIRMATION PROCEDURE	
Diagnosis Procedure	INFOID:000000001341965
NSPECTION PROCEDURE CHECK SELF-DIAGNOSIS RESULTS	
Check self-diagnosis results.	
Self-diagnosis results	
ENGINE SIGNAL 1	
ENGINE SIGNAL 2	
ENGINE SIGNAL 3	
ENGINE SIGNAL 4	
s above displayed on the self-diagnosis display?	
YES >> GO TO 2	
NO >> Inspection end.	
2.CHECK ENGINE SYSTEM	
 Perform ECM self-diagnosis. Repair or replace items indicated, then perform E Refer to <u>EC-1110, "Diagnosis Description"</u>. Perform ABS actuator and electric unit (control unit) self-diagnosis. 	CM self-diagnosis again.
s the inspection result normal?	
YES >> Inspection end. NO >> • Repair or replace malfunctioning components.	
 Perform the self-diagnosis, and make sure that the result shows "NO I 	DTC IS DETECTED".
Component Inspection & Special Repair Requirement	INFOID:000000001341966
COMPONENT INSPECTION Component Inspection	
SPECIAL REPAIR REQUIREMENT Special Repair Requirement	

Ρ

U1000 CAN COMM CIRCUIT

Description

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

DTC Logic

INFOID:000000001341968

INFOID:000000001341969

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

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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

Is above displayed on the self-diagnosis display?

- YES >> Refer to LAN-25. "CAN System Specification Chart".
- NO >> Inspection end.

INFOID:000000001341967

ABS WARNING LAMP

< COMPONENT DIAGNOSIS >

ABS WARNING LAMP

[TCS/ABS]

Ρ

	INFOID:000000001341970
	×: 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:000000001341971
CHECK ABS WARNING LAMP OPERATION	
Check that the lamp illuminates for approximately 1 se	econd after the ignition switch is turned ON
s the inspection result normal?	cond and the ignition switch is tarried on.
YES >> INSPECTION END	
NO >> Go to diagnosis procedure. Refer to <u>BRC</u> .	-103, "Diagnosis Procedure".
Diagnosis Procedure	INFOID:000000001341972
.CHECK SELF-DIAGNOSIS	
	self-diagnosis. Refer to <u>BRC-76. "CONSULT-III Function</u>
<u>ABS)"</u> .	
s tha inchaction raci iit normal /	
s the inspection result normal?	
<u>S the inspection result normal?</u> YES >> GO TO 2 NO >> Check items displayed by self-diagnosis.	
YES >> GO TO 2	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER	meter are normal. Refer to <u>MWI-38, "Diagnosis Descrip-</u>
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. 2.CHECK COMBINATION METER Check if the indication and operation of combination r	meter are normal. Refer to <u>MWI-38, "Diagnosis Descrip-</u>
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination r ion". s the inspection result normal?	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination r ion". s the inspection result normal? YES >> Replace ABS actuator and electric unit (combined of the second secon	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination r ion". s the inspection result normal?	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination r ion". s the inspection result normal? YES >> Replace ABS actuator and electric unit (combined of the second secon	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination r ion". s the inspection result normal? YES >> Replace ABS actuator and electric unit (combined of the second secon	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination r ion". s the inspection result normal? YES >> Replace ABS actuator and electric unit (combined of the second secon	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination r ion". s the inspection result normal? YES >> Replace ABS actuator and electric unit (combined of the second secon	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination r ion". s the inspection result normal? YES >> Replace ABS actuator and electric unit (combined of the second secon	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination r ion". s the inspection result normal? YES >> Replace ABS actuator and electric unit (combined of the second secon	
YES >> GO TO 2 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination r ion". s the inspection result normal? YES >> Replace ABS actuator and electric unit (combined of the second secon	

BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

BRAKE WARNING LAMP

Description

INFOID:000000001341973

×: 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:000000001341974

INFOID:000000001341975

1.BRAKE WARNING 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 <u>BRC-104, "Diagnosis Procedure"</u>.

2. BRAKE WARNING LAMP OPERATION CHECK 2

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake lever (M/T models) or the parking brake pedal (CVT models).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check parking brake switch. Refer to <u>BRC-195. "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.CHECK PARKING BRAKE SWITCH

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake lever (M/T models) or the parking brake pedal (CVT models).

Is the inspection result normal?

YES >> GO TO 2

NO >> Check parking brake switch. Refer to <u>MWI-49, "Diagnosis Procedure"</u>.

2. CHECK SELF-DIAGNOSIS

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

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 <u>MWI-38. "Diagnosis Descrip-</u> tion".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
- NO >> Repair or replace combination meter.

BRC-104

TCS OFF SWITCH

[TCS/ABS] < COMPONENT DIAGNOSIS > TCS OFF SWITCH А Description INFOID:000000001341976 TCS OFF switch can deactivate (turn OFF) the TCS function by pressing the TCS OFF switch. В **Component Function Check** INFOID:000000001341977 1. CHECK TCS OFF SWITCH OPERATION Turn ON/OFF the TCS OFF switch and check that the TCS OFF indicator lamp in the combination meter turns ON/OFF correctly. D Condition TCS OFF indicator lamp illumination status TCS OFF switch: ON ON Е TCS OFF switch: OFF OFF Is the inspection result normal? BRC YES >> INSPECTION END >> Go to diagnosis procedure. Refer to <u>BRC-105, "Diagnosis Procedure"</u>. NO **Diagnosis** Procedure INFOID:000000001341978 INSPECTION PROCEDURE **1.**CHECK TCS OFF SWITCH Н Turn ignition switch OFF and disconnect TCS OFF switch connector M72. 1. Check continuity between TCS OFF switch connector M72 ter-2. minal 1 and 2. T.S. TCS OFF switch connector TCS OFF switch Condition Continuity 21 TCS OFF switch ON Yes 1, 2 TCS OFF switch OFF No Is the inspection result normal? Κ Ω YES >> GO TO 2 >> TCS OFF switch is malfunctioning. Replace TCS OFF NO WFIA0157E switch. 2.check tcs off switch harness 1. Disconnect ABS actuator and electric unit (control unit) connector E26. 2. Check continuity between ABS actuator and electric unit (control Μ unit) connector (A) E26 terminal 13 and TCS OFF switch connector M72 terminal 1. Ν в ABS actuator and electric unit (control unit) TCS OFF switch Continuity 13 1 Yes Ω

3. Check continuity between ABS actuator and electric unit (control unit) connector (A) E26 terminal 13 and ground.

P

AI FIA001277

TCS OFF SWITCH

< COMPONENT DIAGNOSIS >

ABS actuator and electric unit (control unit)	Body ground	Continuity
13	Ground	No

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK TCS OFF SWITCH GROUND

Check continuity between TCS OFF switch connector M72 terminal 2 and ground.

TCS OFF switch	Body ground	Continuity
2	Ground	Yes



Is the inspection result normal?

- YES >> Inspection end.
- NO >> Repair or replace malfunctioning components.

Component Inspection

INSPECTION PROCEDURE

1.CHECK TCS OFF SWITCH

1. Turn ignition switch OFF.

- 2. Disconnect TCS OFF switch connector.
- 3. Check continuity between TCS OFF switch connector terminals.

TCS OFF switch		Condition	Continuity	
Connector	Terminals	Condition	Continuity	
M72 1 – 2		When TCS OFF switch is pressed ON.	Exists	
1-2	When TCS OFF switch is released OFF.	Does not exist		

Is the inspection result normal?

YES >> Inspection end.

NO >> Replace TCS OFF switch.

INFOID:000000001341979

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

ECU DIAGNOSIS ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000001341980

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

Monitor item Display content		Data monitor	
	Condition	Reference value in normal operation	
FR LH SENSOR FR RH SENSOR RR LH SENSOR RR RH SENSOR	0 [km/h]	Vehicle stopped	
	Wheel speed	Nearly matches the speed meter display (± 10 % or less)	Vehicle running (Note 1)
STOP LAMP SW Brake pedal operation	Proke nodel energian	When brake pedal is de- pressed	ON
		When brake pedal is not depressed	OFF
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
OFF SW TCS OFF switch ON/OFF	TCS OFF switch ON (When TCS OFF indica- tor lamp is ON)	ON	
	TCS OFF switch OFF (When TCS OFF indica- tor lamp is OFF)	OFF	
ENGINE RPM With engine running		With engine stopped	0 rpm
	Engine running	Almost in accor- dance with tachome- ter display	
FR LH IN SOL FR LH OUT SOL FR RH IN SOL FR RH OUT SOL RR LH IN SOL RR LH OUT SOL RR RH IN SOL RR RH IN SOL RR RH OUT SOL	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or ac- tuator relay is inactive (in fail-safe mode)	ON	
	When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (ignition switch ON)	OFF	
MOTOR RELAY Motor and motor relay operation		When the motor relay and motor are operating	ON
	Motor and motor relay operation	When the motor relay and motor are not operat- ing	OFF
ACTUATOR RLY (Note 2) Actuator relay operation	Actuator relay operation	When the actuator relay is operating	ON
		When the actuator relay is not operating	OFF
	ABS warning lamp (Note 3)	When ABS warning lamp is ON	ON
		When ABS warning lamp is OFF	OFF

[TCS/ABS]

A

С

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
	TCS OFF indicator lamp (Note 3)	When TCS OFF indica- tor lamp is ON	ON
		When TCS OFF indica- tor lamp is OFF	OFF
SLIP LAMP SLIP indic (Note 3)	SLIP indicator lamp	When SLIP indicator lamp is ON	ON
	(Note 3)	When SLIP indicator lamp is OFF	OFF

Note 1: Confirm tire pressure is normal.

Note 2: A brief moment of ON/OFF condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

Note 3: On and off timing for warning lamp and indicator lamp. Refer to BRC-76, "CONSULT-III Function (ABS)".
< ECU DIAGNOSIS >

[TCS/ABS]



< ECU DIAGNOSIS >

[TCS/ABS]



AWFIA0089GB

< ECU DIAGNOSIS >

[TCS/ABS]



BRC-11 2	2
-----------------	---

< ECU DIAGNOSIS	>
-----------------	---

E26

Connector No.

Connector Name JOINT CONNECTOR-E04

E22

Connector No.

WHITE

Connector Color

E

Signal Name	DS FL	DP RL	DP RR	DP FR	DS FR	DIAG-K	ASR AUS (TCS)	CAN-L	DP FL	DS RL	IGN	DS RR	BLS	CAN-H
Color of wire	æ	Z	W/R	ш	×	0	SB	٩	σ	N/R	GR	B/R	P/B	L
Terminal No.	5	9	ω	თ	10	:	13	15	16	17	18	19	20	26



	Signal Name	I	1
	Color of wire	Ч	4
H.S.	Terminal No.	2	4

Cianol Nomo		I	I	I	I	I	I
Color of	Alla	Ч	Γ	0	Г	Ч	SB
Torminol No		8G	15G	34G	51G	52G	75G





Signal Name	-	-	—	Η	
Color of wire	R/W	B/R	ΓΛ	W/R	
Terminal No. Color of	4	5	13	14	

AWFIA0090GB

< ECU DIAGNOSIS >

[TCS/ABS]



Connector No.	B43
Connector Name	Connector Name REAR WHEEL SENSOR
Connector Color GRAY	GRAY



	REAR WHEEL SENSOR	АҮ		Signal Name	POWER_LH	SIG_LH	POWER_RH	SIG_RH
. B43		lor GRAY		Color of Wire	Z	R/W	W/R	B/R
Connector No.	Connector Name	Connector Color	H.S.	Terminal No.	-	~	e	4

ALFIA0038GB

< ECU DIAGNOSIS >

[TCS/ABS]



< ECU DIAGNOSIS >

[TCS/ABS]



AWFIA0142GB

< ECU DIAGNOSIS >

[TCS/ABS]



BRC-1	1	8
-------	---	---

< ECU DIAGNOSIS >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

E26

Connector No.

Connector Name

Connector Name JOINT CONNECTOR-E04

E22

Connector No.

Signal Name	DS FL	DP RL	DP RR	DP FR	DS FR	DIAG-K	ASR AUS (TCS)	CAN-L	DP FL	DS RL	NZ	DS RR	BLS	CAN-H	
Color of Wire	н	Z	W/R	в	×	0	SB	٩	IJ	R/W	GR	B/R	P/B	μ	
Terminal No.	5	9	æ	6	10	1	13	15	16	17	18	19	20	26	

Connector Color			
.S.H			
5	4 5 6 1 1 6	17 18 19 20 21 22 23 24 25 26 7 8 9 10 11 12 13 14 15	
Terminal No.	Color of Wire	Signal Name	
-	в	MGND	
2	G/R	UB (MR)	
з	R/B	UB (VR)	
4	в	GND	

WHITE	
Connector Color WHITE	际 H.S.

Signal Name	I	Ι	
Color of Wire	Ч	Ч	
Terminal No. Color of Wire	2	4	

Signal Name	I	I	I	I	I	I
Color of Wire	Ч	Γ	0	L	Ч	SB
Terminal No.	8G	15G	34G	51G	52G	75G





Signal Name	I	1	I	1	
Color of Wire	R/W	B/R	ΓΛ	W/R	
Terminal No. Wire	4	5	13	14	

AWFIA0143GB

< ECU DIAGNOSIS >

[TCS/ABS]



Fail-Safe

INFOID:000000001341982

ABS, EBD SYSTEM

In case of electrical malfunctions with the ABS, ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp will turn on. In case of electrical malfunctions with the EBD, brake warning lamp, ABS warning lamp, TCS OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the TCS/ABS become one of the following conditions of the fail-safe function.

BRC-119

< ECU DIAGNOSIS >

[TCS/ABS]

• For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without TCS/ABS system.

NOTE:

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition switch ON" and "The first starting" tests are being performed.

• For malfunction of EBD, EBD and ABS become inoperative, and the condition of vehicle is the same as the condition of vehicles without TCS/ABS, EBD system.

TCS

In case of malfunction in the TCS/ABS system, TCS OFF indicator lamp, SLIP indicator lamp are turned on, and the condition of vehicle is the same as the condition of vehicles without TCS control. **CAUTION:**

If the Fail-Safe function is activated, then perform self-diagnosis for TCS/ABS control system.

DTC No. Index

INFOID:000000001341983

Display item	Malfunction detecting condition	Check item
RR RH SENSOR-1 [C1101]	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
RR LH SENSOR-1 [C1102]	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
FR RH SENSOR-1 [C1103]	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
FR LH SENSOR-1 [C1104]	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
RR RH SENSOR-2 [C1105]	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.	<u>BRC-81, "Diagno-</u> <u>sis Procedure"</u> (Note)
RR LH SENSOR-2 [C1106]	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.	
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the dis- tance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR LH SENSOR- 2 [C1108]	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.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-87, "Diagno- sis Procedure"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-89, "Diagno- sis Procedure"
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.	BRC-90, "Diagno-
[C1111]	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	sis Procedure"
MAIN RELAY [C1114]	Actuator solenoid valve relay is ON, even if control unit sends OFF signal. Actuator solenoid valve relay is OFF, even if control unit sends ON signal.	BRC-92, "Diagno- sis Procedure"
ABS SENSOR [C1115]	Teeth damage on sensor rotor or improper installation of wheel sensor.	BRC-94, "Diagno- sis Procedure"
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-97, "Diagno- sis Procedure"
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-99, "Diagno- sis Procedure"
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-97, "Diagno- sis Procedure"

< ECU DIAGNOSIS >

[TCS/ABS]

Display item	Malfunction detecting condition	Check item	0
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-99, "Diagno- sis Procedure"	A
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	BRC-97, "Diagno- sis Procedure"	В
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-99, "Diagno- sis Procedure"	
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-97, "Diagno- sis Procedure"	С
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-99, "Diagno- sis Procedure"	D
ENGINE SIGNAL 1 [C1130]	Fuel cut control abnormal.		
ENGINE SIGNAL 2 [C1131]	Electric throttle control abnormal.	BRC-101, "Diagno-	E
ENGINE SIGNAL 3 [C1132]	ECM CAN communication abnormal.	sis Procedure"	BRC
ENGINE SIGNAL 4 [C1133]	ECM communication to ABS actuator and electric unit (control unit) abnormal.		
CAN COMM CIRCUIT [U1000]	When there is a malfunction in the CAN communication circuit.	BRC-102, "Diagno- sis Procedure"	G

Note: After completing repairs of shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Make sure that ABS warning lamp turns off while driving vehicle at 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for wheels, check wheel sensor circuit and also check control unit power voltage.

|

Н

J

Κ

L

M

Ν

0

SYMPTOM DIAGNOSIS TCS

Symptom Table

INFOID:000000001341984

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

Symptom	Check item	Reference
	Brake force distribution	
Excessive ABS function operation fre- quency	Looseness of front and rear axle	<u>BRC-123, "Diag-</u> nosis Procedure"
4.0	Wheel sensor and rotor system	<u></u>
Unexpected pedal reaction	Brake pedal stroke	BRC-124, "Diag-
Onexpected 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-125, "Diag- nosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-126, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-127, "Diag-
occurs (Note 2)	ABS actuator and electric unit (control unit)	nosis Procedure"
Vehicle jerks during TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-128, "Diag-
	ECM	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 (just place a foot on it). However, this is normal.
- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [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 < SYMPTOM DIAGNOSIS > [TCS/AE	351
EXCESSIVE ABS FUNCTION OPERATION FREQUENCY	
Diagnosis Procedure	341985
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, "Inspection"</u> , Re <u>RAX-5, "On-vehicle Service"</u> .	ear:
Is the inspection result normal?	
YES >> GO TO 3 NO >> Repair or replace malfunctioning components.	
NO >> Repair or replace malfunctioning components. 3.CHECK WHEEL SENSOR AND SENSOR ROTOR	
CHECK WHELE 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.	
<u>Is the inspection result normal?</u> YES >> GO TO 4	
NO >> • Replace wheel sensor or sensor rotor.	
Repair harness.	
4.CHECK ABS WARNING LAMP DISPLAY	
Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving.	
Is the inspection result normal?	
 YES >> System normal. NO >> Perform self-diagnosis. Refer to <u>BRC-12, "CONSULT-III Function (ABS)"</u>. 	

L

Μ

Ν

Ο

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:000000001341986

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to <u>BR-12, "Inspection and Adjustment"</u>.

Is the stroke too big?

- YES >> Bleed air from brake tube and hose. Refer to <u>BR-15. "Bleeding Brake System"</u>.
 - Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: <u>BR-12</u>, "<u>Inspection and Adjustment</u>", brake booster and master cylinder: <u>BR-10</u>, "<u>Inspection</u>".

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 >> GO TO procedure 3 "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom 1. Refer to BRC-54. "Diagnosis Procedure".
- NO >> Check brake system.

< SYMPTOM DIAGNOSIS >

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 >> GO TO procedure 3 "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom 1. Refer to <u>BRC-54, "Diagnosis Procedure"</u>.
- NO >> Check brake system.

INFOID:000000001341987

BRC

А

В

С

D

Е

Н

Κ

L

Μ

Ν

Ρ

BRC-125

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

[TCS/ABS]

INFOID:000000001341988

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 >> GO TO procedure 3 "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom 1. Refer to BRC-54, "Diagnosis Procedure".
- NO >> Perform self-diagnosis. Refer to <u>BRC-12. "CONSULT-III Function (ABS)"</u>.

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS< SYMPTOM DIAGNOSIS >[TCS/ABS]PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS	А
Diagnosis Procedure	1
CAUTION: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal. • When shifting gears	В
 When driving on slippery road During cornering at high speed 	С
 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] SYMPTOM CHECK 1 	D
Check if there is pedal vibration or operation sound when the engine is started.	
Do symptoms occur?	E
YES >> GO TO 2 NO >> Perform self -diagnosis. Refer to <u>BRC-76, "CONSULT-III Function (ABS)"</u> . 2. SYMPTOM CHECK 2	BRC
Check symptoms when electrical component (headlamps, etc.) switches are operated.	
Do symptoms occur?	G
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 >> GO TO procedure 3 "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom 1. Refer to BRC-12, "CONSULT-III Function (ABS)". 	Н

J

Κ

L

Μ

Ν

0

VEHICLE JERKS DURING TCS/ABS CONTROL

Diagnosis Procedure

INFOID:000000001341990

[TCS/ABS]

1.SYMPTOM CHECK

Check if the vehicle jerks during TCS/ABS control.

Is the inspection result normal?

YES >> Normal.

NO >> GO TO 2

2. CHECK SELF-DIAGNOSIS RESULTS

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

Are self-diagnosis results indicated?

YES >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis.

NO >> GO TO 3

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?

YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. NO >> GO TO 4

4.CHECK ECM AND CVT SELF-DIAGNOSIS RESULTS

Perform ECM and CVT self-diagnosis.

Are self-diagnosis results indicated?

- YES >> Check the corresponding items.
 - ECM: Refer to EC-1123, "CONSULT-III Function".
 - CVT: Refer to <u>TM-117, "Diagnosis Description"</u>.
- NO >> Replace ABS actuator and electric unit (control unit).

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

INFOID:000000001341991

[TCS/ABS]

Symptom	Result	В
Slight vibrations are felt on the brake pedal and the operation noises occur, when 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 condi- tion due to the TCS or ABS activation.	С
The brake pedal moves and generates noises, when TCS 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 a normal, and it is caused by the ABS operation check.	D
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because	E
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).	DD
The ABS warning 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 road. If the normal con-	BR
The ABS warning lamp, TCS 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).	dition is restored, there is no malfunction. At that time, erase the self- diagnosis memory.	G
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 TCS function before performing an inspec- tion on a chassis dyna- mometer.)	H
TCS OFF indicator lamp and SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a TCS sys- tem error but results from characteristic change of tire.	J

Κ

L

Μ

Ν

Ο

Ρ

А

< PRECAUTION > PRECAUTION PRECAUTIONS

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

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

- Recommended fluid is brake fluid "DOT 3".
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted surface of body. If brake fluid is splashed on painted surfaces of body immediately wipe off then with cloth and then wash it away with water.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect connectors of ABS actuator and electric unit (control unit) or the battery cable from the negative terminal.

WARNING:

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

Precaution for Brake Control



INFOID:000000001341994

INFOID:000000001341993

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

PRECAUTIONS

[TCS/ABS] parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.). А - When driving with worn or deteriorated suspension, tires and brake-related parts. В

BRC

С

D

Е

G

Н

J

Κ

L

Μ

Ν

Ο

< PRECAUTION >

PREPARATION

PREPARATION

Special Service Tool

INFOID:000000001341995

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
 (J-45741) ABS active wheel sensor tester	VFIA0101E	Checking operation of ABS active wheel sen- sor

Commercial Service Tool

INFOID:000000001341996

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

[TCS/ABS]

WHEEL SENSORS

< ON-VEHICLE REPAIR >

ON-VEHICLE REPAIR WHEEL SENSORS

Removal and Installation

INFOID:000000001341998



CAUTION:

- Be careful not to damage wheel sensor edge and sensor rotor teeth.
- When removing the front or rear wheel hub assembly, first remove the wheel sensor from the assembly. Failure to do so may result in damage to the wheel sensor wires making the sensor inoperative.
 CAUTION:
- Pull out the wheel sensor, being careful to turn it as little as possible. Do not pull on the wheel sensor harness.
- Installation should be performed while paying attention to the following, and then tighten bolts and nuts to the specified torque.
- Check if foreign objects such as iron fragments are adhered to the pick-up part of the sensor or to the inside of the hole for the wheel sensor, or if a foreign object is caught in the surface of the mating surface for the rotor. If something wrong is found, fix it and then install the wheel sensor.

REMOVAL

Fro	Front			
1.	Remove wheel and tire using power tool.			
2.	Partially front wheel fender protector. Refer to EXT-19, "Removal and Installation".			
3.	Remove wheel sensor bolt and wheel sensor.	Ν		
4.	Remove harness wire from mounts and disconnect wheel sensor harness connector.			
	Rear NOTE:			
Bot	h rear wheel sensors share one harness and must be replaced as an assembly.			
1.	Remove wheel and tire using power tool.			
2.	Remove wheel sensor bolts and wheel sensors from both rear wheels.	Ρ		
3.	Remove harness wire from mounts and harness wire clips from suspension member.			

BRC-133

А

J

Κ

L

WHEEL SENSORS

< ON-VEHICLE REPAIR >

4. Disconnect wheel sensor harness connector (1).



INSTALLATION

Installation is in the reverse order of removal.

• When installing wheel and tire, refer to WT-37, "Adjustment".

< ON-VEHICLE REPAIR >

SENSOR ROTOR

Removal and Installation

The front and rear wheel sensor rotors are an integral part of the wheel hub assemblies and can not be disassembled. When replacing the sensor rotor, replace the wheel hub assembly. Refer to FAX-7, "Removal and Installation" (Front), RAX-6, "Removal and Installation" (Rear).

G

Н

J

Κ

L

Μ

Ν

Ο

Ρ

INFOID:000000001341999

С

D

Е

В

А

< ON-VEHICLE REPAIR >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

COMPONENT

INFOID:000000001342000



1. From master cylinder secondary side 2. From master cylinder primary side

To rear LH brake caliper

Grommet

5.

8.

- To front LH brake caliper 6.
- 3. Bracket
- To rear RH brake caliper
- To front RH brake caliper 9. ABS actuator and electric unit

⇐ Front

4.

7.

Removal and Installation

REMOVAL

CAUTION:

- Be careful of the following.
- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut torque wrench.
- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Do not remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to BR-15, "Bleeding Brake System".

BRC-136

INFOID:000000001342001

[TCS/ABS]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [TCS/ABS] < ON-VEHICLE REPAIR > 1. Remove front wiper arms. Refer to WW-40, "FRONT WIPER ARMS : Removal and Installation". А 2. Remove cowl top. Refer to EXT-18, "Removal and Installation". Disconnect washer hose. 4. Remove tower bar, if equipped. Refer to FSU-11, "Exploded View". В 5. Disconnect ABS actuator and electric unit (control unit) connector. 6. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit). 7. Remove ABS actuator and electric unit (control unit) nuts. 8. Remove ABS actuator and electric unit (control unit) from vehicle. 9. Remove bracket as necessary. D INSTALLATION CAUTION: Be careful of the following. • Before servicing, disconnect the battery cable from negative terminal. Е • To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut torque wrench. Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it. BRC Do not remove and install actuator by holding harness. After work is completed, bleed air from brake tube. Refer to BR-15, "Bleeding Brake System". After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked. Installation is in the reverse order of removal.

Н

Κ

L

Μ

Ν

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 ajusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to BRC-142, "ADJUSTMENT OF STEERING ANGLE SENSOR **NEUTRAL POSITION : Description".**

DESCRIPTION

Basic Concept

- The most important point to perform trouble diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.
- · It is also important to clarify customer complaints before inspection.

First of all, reproduce symptom, and understand it fully.

Ask customer about his/her complaints carefully. In some cases, they will be necessary to check symptom by driving vehicle with customer.

CAUTION:

Customers are not professionals. Do not assume "maybe customer means..." or "maybe customer mentioned this symptom".

- SEE234G
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.

For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.

- After diagnostic, make sure to perform "ERASE MEMORY". Refer to BRC-148, "CONSULT-III Function (ABS)".
- Always read "GI General Information" to confirm general precautions. Refer to GI-3.

Asking Complaints

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- · It is also important to use diagnostic sheet so as not to miss information.







INFOID:000000001342002

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[VDC/TCS/ABS]

OVERALL SEQUENCE



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 <u>BRC-141</u>, "<u>Diagnostic Work</u> <u>Sheet</u>".

BRC-139

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

>> GO TO 2.

2.PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function. Refer to BRC-148, "CONSULT-III Function (ABS)". Is there any DTC displayed?

YES >> GO TO 3.

>> GO TO 4. NO

 ${f 3}.$ PERFORM THE SYSTEM DIAGNOSIS

Perform the diagnosis applicable to the displayed DTC. Refer to <u>BRC-222, "DTC No. Index"</u>.

>> 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-148. "CONSULT-III Function (ABS)".

Is the symptom is a normal operation?

>> INSPECTION END YES

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 <u>BRC-199, "Description"</u>.
- Brake warning lamp: Refer to BRC-200, "Description".
- VDC OFF indicator lamp: Refer to BRC-201, "Description".
- SLIP indicator lamp: Refer to BRC-202, "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 BRC-148, "CONSULT-III Function (ABS)".

Is no other DTC present and the repair completed?

YES >> INSPACTION END NO >> GO TO 3.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

Diagnostic Work Sheet

INFOID:000000001342003

[VDC/TCS/ABS]

Customer name MR/MS	Model & Year		VIN	
Engine # Trans.			Mileage	
Incident Date	Manuf. Date	Manuf. Date		
Symptoms	 □ Noise and vibration (from engine compartment) □ Noise and vibration (from axle) 	Warning / Indicator activate	Firm pedal operation Large stroke pedal operation	
	TCS does not work (Rear wheels slip when accelerating)	ABS does not work (Wheels lock when braking)		
Engine conditions	□ When starting □ After starting			
Road conditions				
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

А

В

С

BRC

G

Н

Κ

L

M

Ν

0

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[VDC/TCS/ABS]

INSPECTION AND ADJUSTMENT ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

INFOID:000000001342004

After replacing the ABS actuator and electric unit (control unit), perform the neutral position adjustment for the steering angle sensor.

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement

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-142, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION :</u> <u>Description"</u>.

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:000000001342006

In case of doing work that applies to the list below, make sure to adjust neutral position of steering angle sensor before running vehicle.

 $\times:$ 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 4WAS components	×
Replacing 4WAS components	×
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

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

1.ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

 $\mathbf{2}.$ PERFORM THE NEUTRAL POSITION ADJUSTMENT FOR THE STEERING ANGLE SENSOR

INSPECTION AND ADJUSTMENT

< B	BASIC INSPECTION > [VDC/TCS	S/ABS]
1. 2.	On the CONSULT-III screen, touch "WORK SUPPORT", then "ST ANG SEN ADJUSTMENT". Touch "START". CAUTION:	A
3.	Do not touch steering wheel while adjusting steering angle sensor. After approximately 10 seconds, touch "END".	В
4.	NOTE: After approximately 60 seconds, the adjustment ends automatically. Turn ignition switch OFF, then turn it ON again.	
	CAUTION: Be sure to perform above operation.	С
0	>> GO TO 3.	D
3.	CHECK DATA MONITOR	
1. 2.	Run vehicle with front wheels in straight-ahead position, then stop. Select "DATA MONITOR". Then make sure "STR ANGLE SIG" is within 0±2.5°.	E
	he steering angle within the specified range?	
YI N	 ES >> GO TO 4. O >> Perform the neutral position adjustment for the steering angle sensor again, GO TO 1. 	BRO
	ERASE THE SELF-DIAGNOSIS MEMORY	
	ase the self-diagnosis memories of the ABS actuator and electric unit (control unit) and ECM.	G
• A	BS actuator and electric unit (control unit): Refer to <u>BRC-148, "CONSULT-III Function (ABS)"</u> . CM: Refer to <u>BRC-148, "CONSULT-III Function (ABS)"</u> .	0
<u>Are</u>	e the memories erased?	Н
	ES >> INSPECTION END	
N	O >> Check the items indicated by the self-diagnosis.	1
		I
		J
		К
		1 X
		L
		Μ
		Ν
		0
		_
		Р

< FUNCTION DIAGNOSIS > FUNCTION DIAGNOSIS

System Diagram

INFOID:000000001342008



- 1. Rear RH wheel sensor
- 4. Front RH wheel sensor
- 7. Front LH wheel sensor
- 2. Yaw rate/side/decel G sensor
- 5. TCM
 - 8. VDC OFF switch
- 10. Steering angle sensor
- 11. Rear LH wheel sensor
- ABS actuator and electric unit (control unit)
- 6. ECM
- 9. ABS, SLIP, VDC OFF and BRAKE indicator lamps (combination meter)

System Description

INFOID:000000001342009

ABS, EBD SYSTEM

In case of electrical malfunctions with the ABS, ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp will turn on. In case of electrical malfunctions with the EBD, brake warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the fail-safe function.

• For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without TCS/ABS system.

NOTE:

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition switch ON" and "The first starting" are being performed.

• For malfunction of EBD, EBD and ABS become inoperative, and the condition of vehicle is the same as the condition of vehicles without TCS/ABS, EBD system.

VDC / TCS

In case of malfunction in the VDC/TCS/ABS system, VDC OFF indicator lamp, SLIP indicator lamp are turned on, and the condition of vehicle is the same as the condition of vehicles without VDC/TCS control. **CAUTION:**

If the Fail-Safe function is activated, then perform self-diagnosis for VDC/TCS/ABS control system.

BRC-144
< FUNCTION DIAGNOSIS >

ELECTRICAL COMPONENTS



OPERATION THAT IS NOT "SYSTEM ERROR"

Operation That Is Not "System Error"

< FUNCTION DIAGNOSIS >

ABS

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

TCS

- Depending on road circumstances, driver may have a sluggish feel. This is normal, because optimum traction has highest priority under TCS operation.
- When vehicle is passing through a road where surface friction varies, downshifting or depressing accelerator pedal fully may activate TCS temporarily.

VDC

- During VDC operation, body and brake pedal lightly vibrate and mechanical sounds may be heard. This is normal.
- If vehicle is rotated on turn table, or rolled and rocked on ship, ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp may turn on. In this case, start engine on normal road again. If ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turn off after restart, it is normal.
- When starting TCS or VDC under rapid acceleration or hard turn, operating sound by brake pedal is generated. However, this is not malfunction. This is because TCS and VDC are functioning normally.
- VDC may not operate normally or ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp may turn on when driving special roads with extremely steep slant (banks on circuit road and so on.) However, it is not malfunction when returning to a normal state after restarting the engine. In that case, be sure to erase the memory of self-diagnosis. Refer to <u>BRC-148</u>, "<u>CONSULT-III Function (ABS)</u>".
- Yaw rate /side G sensor malfunction may occur under hard turn like spin turn, rapid acceleration turn, drift run, etc., when VDC function is OFF (VDC OFF switch is turned on). It is not malfunction if it is possible to return to a normal position after restarting engine. Then erase the memory of self-diagnosis. Refer to <u>BRC-148</u>, "CONSULT-III Function (ABS)".
- 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 tires.

CAN Communication Refer to LAN-7, "System Description".

< FUNCTION DIAGNOSIS >

Component Parts Location

[VDC/TCS/ABS]



А

В

С

D

Е

BRC

G

Н

J

Κ

L

Μ

Ν

Ο

Ρ





1. Front wheel sensor RH E41

2.

- ABS actuator and electric unit 3. Yaw rate/side/decel G sensor M55 (control unit) E26
 - **BRC-147**

Rear wheel sensor LH B43

VDC OFF switch M72

5.

8.

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

- 4. Rear wheel sensor RH B43
- 7. Combination meter M24
 - a: US models
 - b: Canada models
 - c: US models
 - d: Canada models

Component Description

 Steering angle sensor (behind spiral cable) (Steering wheel removed for clarity) M53

9. Front wheel sensor LH E19

INFOID:000000001342011

Compo	Reference	
	Pump	PPC 164 "Departmention"
	Motor	BRC-164, "Description"
	Actuator relay (Main relay)	BRC-166, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-173, "Description"
	Pressure sensor	BRC-179, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-197, "Description"
Wheel sensor	BRC-155, "Description"	
Yaw rate/side G sensor	BRC-183, "Description"	
Steering angle sensor	BRC-181, "Description"	
VDC OFF switch	BRC-197, "Description"	
ABS warning lamp		BRC-199, "Description"
Brake warning lamp	BRC-200, "Description"	
Parking brake switch		BRC-195, "Description"
VDC OFF indicator lamp		BRC-201, "Description"
SLIP indicator lamp		BRC-202, "Description"

CONSULT-III Function (ABS)

INFOID:000000001342012

APPLICATION ITEM ABS

BASIC OPERATION PROCEDURE

WORK SUPPORT

Operation Procedure

In case of doing work that applies to the list below, make sure to adjust neutral position of steering angle sensor before running vehicle.

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	×
Removing/Installing steering components	×
Removing/Installing suspension components	×
Change tires to new ones	-
Tire rotation	-
Adjusting wheel alignment	×

×: Required

-: Not required

BRC-148

То	UTION: adjust neutral position of steering angle sensor, make sure to use CONSULT-III. djustment cannot be done without CONSULT-III.)	А
1.	Stop vehicle with front wheels in straight-ahead position.	
2.	Turn ignition switch ON and touch the CONSULT-III screen in the order of "ABS", "WORK SUPPORT" and "ST ANG SEN ADJUSTMENT".	В
3.	Touch "START". CAUTION: Do not touch steering wheel while adjusting steering angle sensor.	С
4.		
5.	Turn ignition switch OFF, then turn it ON again. CAUTION:	D
~	Be sure to perform above operation.	Е
6.	5 1 <i>7</i> 1	
7.	Select "DATA MONITOR", "ECU INPUT SIGNALS", and "STR ANGLE SIG" on CONSULT-III screen. Then make sure "STR ANGLE SIG" is within 0±2.5°. If value is more than specification, repeat steps 1 to 6.	BR
8.	Erase memory of ABS actuator and electric unit (control unit) and ECM. ABS actuator and electric unit (control unit): Refer to <u>BRC-148, "CONSULT-III Function (ABS)"</u> . ECM: Refer to <u>EC-1012, "Work Flow"</u> .	
9.	Turn ignition switch OFF.	G
SE	LF-DIAGNOSIS RESULTS	
Ope	eration Procedure	Н
1.	Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.	
2.	After stopping vehicle, with the engine running, touch "ABS", "SELF-DIAG RESULTS" in order on the CONSULT-III screen.	Ι
3.	 The self-diagnostic results are displayed. Check ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp if "NO FAILURE" is displayed. Refer to <u>BRC-225</u>, "Symptom Table". 	J
4.	Perform the appropriate inspection from display item list, and repair or replace the malfunctioning component.Refer to "Display Item List".	
5.	Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.	Κ
	CAUTION: 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.	L
Era	se Memory	M
1.	Turn ignition switch OFF.	
2.	Start engine and touch "ABS", "SELF-DIAG RESULTS", "ERASE MEMORY" in order on the CONSULT-III screen to erase the diagnostic memory. If "ABS" is not indicated, go to <u>GI-50, "Description"</u> . CAUTION:	Ν
	If the diagnostic memory is not erased, re-perform the operation procedure starting with step 1.	~
3.	Perform self-diagnosis again, and make sure that diagnostic memory is erased.	0
4.	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.	Ρ
	DTE:	
	Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or of brake fluid level	
	witch operation (when brake fluid is insufficient). /DC OFF switch should not stay "ON" position.	

Display Item List

< FUNCTION DIAGNOSIS >

< FUNCTION DIAGNOSIS >

Display item	Malfunction detecting condition	Check item	
RR RH SENSOR-1 [C1101]	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.		
RR LH SENSOR-1Circuit of rear LH wheel sensor is open. Or when the sensor power volt[C1102]the standard.			
FR RH SENSOR-1 [C1103]	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.		
FR LH SENSOR-1 [C1104]	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.		
RR RH SENSOR-2 [C1105]	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.	BRC-155, "De- scription" (Note 1)	
RR LH SENSOR-2 [C1106]	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.		
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the dis- tance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.		
FR LH SENSOR- 2 [C1108]	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.		
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-161, "De- scription"	
CONTROLLER FAILURE [C1110]			
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.	BRC-164, "De-	
[C1111]	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	scription"	
MAIN RELAY	During the actuator relay operating with OFF, when the actuator relay turns ON. Or when the control line for the relay is shorted to the ground.	BRC-166, "De-	
[C1114]	During the actuator relay operating with ON, when the actuator relay turns OFF, or when the control line for the relay is open.	scription"	
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input signal is malfunctioning.	BRC-168, "De- scription" (Note 1)	
STOP LAMP SW [C1116]	When stop lamp switch circuit is open.	BRC-171, "De- scription"	

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

Display item	Malfunction detecting condition	Check item	-
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.		- A
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.		В
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.		
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	<u>BRC-173, "De-</u>	С
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	scription"	D
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.		
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.		E
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	-	BRC
ENGINE SIGNAL 1 [C1130]			
ENGINE SIGNAL 2 [C1131]			G
ENGINE SIGNAL 3 [C1132]	Major engine components are malfunctioning.	BRC-177, "De- scription"	Н
ENGINE SIGNAL 4 [C1133]	_		
ENGINE SIGNAL 6 [C1136]			
PRESS SEN CIRCUIT [C1142]	Pressure sensor signal line is open or shorted, or pressure sensor is malfunctioning.	BRC-179, "De- scription"	– J
ST ANG SEN CIRCUIT [C1143]	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	BRC-181, "De-	_
ST ANG SEN SIGNAL [C1144]	Neutral position correction of steering angle sensor is not finished.	scription"	Κ
YAW RATE SENSOR [C1145]	Yaw rate sensor is malfunctioning, or the yaw rate sensor signal line is open or shorted.	BRC-183, "De-	-
SIDE G-SEN CIRCUIT [C1146]	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	scription"	
USV LINE [FL-RR] [C1147]	VDC switch-over solenoid valve (USV1) on the primary side is open circuit or short- ed, or the control line is open or shorted to the power supply or the ground.		M
USV LINE [FR-RL] [C1148]	VDC switch-over solenoid valve (USV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	BRC-186, "De-	Ν
HSV LINE [FL-RR] [C1149]	R] VDC switch-over solenoid valve (HSV1) on the primary side is open circuit or short- ed, or the control line is open or shorted to the power supply or the ground.		IN
HSV LINE [FR-RL] [C1150]	VDC switch-over solenoid valve (HSV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.		0
PNP POS SIG [C1154]	TCM or ABS actuator and electric unit (control unit) internal malfunction.	BRC-189, "De- scription"	- -
BR FLUID LEVEL LOW [C1155]	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.	BRC-190, "De- scription"	- P
ST ANG SEN COM CIR [C1156]	CAN communication circuit or steering angle sensor is malfunctioning.	BRC-193, "De- scription"	_
CAN COMM CIRCUIT [U1000]	When there is a malfunction in the CAN communication circuit.	BRC-194, "De- scription" (Note 2)	_

< FUNCTION DIAGNOSIS >

Note 1: After completing repairs of shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Make sure that ABS warning lamp turns off while driving vehicle at 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for wheels, check wheel sensor circuit and also check control unit power voltage. Note 2: When malfunctions are detected in several systems, including CAN communication circuit [U1000], troubleshoot CAN communication circuit. Refer to LAN-16. "Trouble Diagnosis Procedure".

DATA MONITOR

Display Item List 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.

Item	Data	monitor item sel	ection		
(Unit)	ECU INPUT SIGNALS	MAIN SIG- NALS	SELECTION FROM MENU	Remarks	
FR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by front LH wheel sensor sig- nal is displayed.	
FR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by front RH wheel sensor sig- nal is displayed.	
RR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.	
RR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear RH wheel sensor sig- nal is displayed.	
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.	
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (con- trol unit) is displayed.	
GEAR	×	×	×	Gear position judged by PNP switch signal is displayed.	
SLCT LVR POSI	×	×	×	Shift position judged by PNP switch signal.	
OFF SW (ON/OFF)	×	×	×	VDC OFF switch (ON/OFF) status is displayed.	
ACCEL POS SIG (%)	×	_	×	Throttle valve open/close status judged by CAN com- munication signal is displayed.	
SIDE G-SENSOR (m/s ²)	×	_	×	Lateral acceleration detected by side G sensor is displayed.	
STR ANGLE SIG (°)	×	—	×	Steering angle detected by steering angle sensor is displayed.	
PRESS SENSOR (bar)	×	_	×	Brake fluid pressure detected by pressure sensor is displayed.	
ENGINE RPM (rpm)	×	—	×	Engine speed judged by CAN communication signal is displayed.	
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor is displayed.	
FLUID LEV SW (ON/OFF)	×	—	×	Brake fluid level switch (ON/OFF) status is displayed.	
PARK BRAKE SW (ON/OFF)	×	_	×	Parking brake switch (ON/OFF) status is displayed.	
4WD MODE MON	×	×	×	AWD activated.	
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.	
FR LH IN SOL (ON/OFF)	—	×	×	Front LH IN ABS solenoid (ON/OFF) status is displayed.	

< FUNCTION DIAGNOSIS >

FR LH OUT SOL (ON/OFF)	_	×	×	Front LH OUT ABS solenoid (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	_	×	×	Rear RH IN ABS solenoid (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	_	×	×	Rear RH OUT ABS solenoid (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	_	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	_	×	×	Rear LH OUT ABS solenoid (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	_	×	×	ABS motor relay signal (ON/OFF) status is displayed.
ACTUATOR RLY (ON/OFF)	_	×	×	ABS actuator relay signal (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	_	×	×	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	_	×	×	VDC OFF lamp (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	_	×	×	SLIP indicator lamp (ON/OFF) status is displayed.
M-MODE SIG (ON/OFF)	_	_	×	M mode (ON/OFF) status judged by CAN communica- tion signal 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 FAIL SIG (ON/OFF)	_	_	×	EBD fail signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	_		×	ABS fail signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	_		×	TCS fail signal (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	_	_	×	VDC fail signal (ON/OFF) status is displayed.
CRANKING SIG (ON/OFF)	_	_	×	Cranking condition (ON/OFF) status is displayed.
USV [FL-RR] (ON/OFF)	_	_	×	Primary side USV solenoid valve (ON/OFF) status is displayed.
USV [FR-RL] (ON/OFF)	_	_	×	Secondary side USV solenoid valve (ON/OFF) status is displayed.
HSV [FL-RR] (ON/OFF)	_		×	Primary side HSV solenoid valve (ON/OFF) status is displayed.
HSV [FR-RL] (ON/OFF)	_		×	Secondary side HSV solenoid valve (ON/OFF) status is displayed.
V/R OUTPUT (ON/OFF) (Note)	_		×	Valve relay operation signal (ON/OFF) status is displayed.
M/R OUTPUT (ON/OFF)	_		×	Motor relay operation signal (ON/OFF) status is displayed.
: Applicable	1	1	L	

-: Not applicable

BRC-153

< FUNCTION DIAGNOSIS >

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

ACTIVE TEST

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 indicator lamp, SLIP indicator lamp and brake warning lamp are 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" and repeat step 3.

Solenoid Valve

NOTE:

The example shown is for front right wheel. The procedure for the other wheels is the same as given below.

- 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 (IN, OUT, USV, HSV) operate as shown in the table below.

Operation	ABS solenoid valve			ABS solenoid valve (ACT)		
(Note)	UP	KEEP	DOWN	UP	ACT UP	ACT KEEP
FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
USV [FR-RL]	OFF	OFF	OFF	OFF	ON	ON
HSV [FR-RL]	OFF	OFF	OFF	OFF	ON*	OFF

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

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

ABS Motor

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 (Note)	ON	ON

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

DTC	Display item	Malfunction detected condition	ion	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.		
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.			
DTC CC	INFIRMATION PROCE	DURE			
1. CHEC	CK SELF-DIAGNOSIS RE	SULTS			
Check th	e self-diagnosis results.				
	J				
	Self-diagnosis	results			
	RR RH SENS	OR-1			
	RR LH SENS	OR-1			
	FR RH SENS	OR-1			
	FR LH SENS				
	displayed on the self-dia				
YES NO	>> Proceed to diagnosis >> INSPECTION END	procedure. Refer to <u>BRC-155, "Dia</u>	gnosis Proce	<u>dure"</u> .	
-	nfirmation Procedure				
Diagno	sis Procedure			INFOID:00000001342015	
U				NN 012.00000001042010	
	N: :heck between wheel se	near tarminale			
	TION PROCEDURE				
	CK CONNECTOR				
		onnect ABS actuator and electric up or E41 (FR-RH), E19 (FR-LH), B43			
		, loose, etc., Repair or replace it if a			
	spection result normal?				
Is the ins					
YES	>> GO TO 2				
YES NO	>> GO TO 2 >> Repair or replace as r CK WHEEL SENSOR OU				

BRC-155

Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter. 2.

3. Turn on the ABS active wheel sensor tester power switch.

NOTE:

C1101, C1102, C1103, C1104 WHEEL SENSOR-1 < COMPONENT DIAGNOSIS >

COMPONENT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR-1

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

INFOID:000000001342014

D

А

В

С

[VDC/TCS/ABS]

INFOID:000000001342013

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace wheel sensor. Refer to <u>BRC-235, "Removal and Installation"</u>.

3.CHECK TIRE

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

YES >> GO TO 4 NO >> • Adjust a

>> • Adjust air pressure, or replace tire.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5, "Inspection"</u> (front) or <u>RAX-5, "On-vehicle Service"</u> (rear). <u>Is the inspection result normal?</u>

- YES >> GO TO 5
- NO >> Repair or replace as necessary. Refer to <u>FAX-7, "Removal and Installation"</u> (front) or <u>RAX-8,</u> <u>"Wheel Bearing (Rear)"</u> (rear).
- **5.**CHECK WHEEL SENSOR HARNESS
- Turn ignition switch OFF and disconnect malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH) and ABS actuator and electric unit (control unit) connector E26.
- 2. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)



	Power supply circuit		Signal circuit		Ground circuit	
Wheel	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (Signal - Ground) (A)	ABS actuator and electric unit (control unit) (A) (Signal) - Body Ground
Front RH	9	1	10	2	9, 10 - 1, 4	9, 10 - Body ground
Front LH	16	1	5	2	16, 5 - 1, 4	16, 5 - Body ground
Rear RH	8	3	19	4	8, 19 - 1, 4	8, 19 - Body ground
Rear LH	6	1	17	2	6, 17 - 1, 4	6, 17 - Body ground

Power supply circuit

- : Continuity should exist.
- : Continuity should exist.
- Signal circuit Ground circuit
- : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> • Repair or replace malfunctioning components.

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

6.CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- Reconnect ABS actuator and electric unit (control unit) connector.
- 2. Turn ignition switch ON and check between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH (A)			
Front LH (A)	1		0.1/
Rear LH (B)			8 V or more
Rear RH (B)	3		



Is the inspection result normal?

YES >> Inspection end.

NO >> Replace ABS actuator and electric unit (control unit).

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	-
the inspection result normal?	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-155, "Diagnosis Procedure"</u>.

BRC

INFOID:000000001342016

А

Н

Κ

L

Μ

Ν

Ρ

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

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

INFOID:000000001342018

INFOID:000000001342017

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1106	RR LH SENSOR-2	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	Harness or connectorWheel sensor
C1107	FR RH SENSOR-2	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)
C1108	FR LH SENSOR-2	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-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-158</u>, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CHECK CONNECTOR

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26 and malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH). Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Disconnect connectors from wheel sensor of malfunction code No.

- 2. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- 3. 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.

INFOID:000000001342019

BRC-158

[VDC/TCS/ABS]

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

4. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal. NOTE: If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and
retest.
Does the ABS active wheel sensor tester detect a signal?
YES >> GO TO 3 NO >> Replace wheel sensor. Refer to <u>BRC-235, "Removal and Installation"</u> .
3. CHECK TIRE
Check air pressure, wear and size.
Are air pressure, wear and size within standard?
 YES >> GO TO 4 NO >> • Adjust air pressure, or replace tire. • Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
4.CHECK WHEEL BEARINGS
Check wheel bearing axial end play. Refer to <u>FAX-5</u> , "Inspection" (front) or <u>RAX-5</u> , "On-vehicle Service" (rear). Is the inspection result normal?
YES >> GO TO 5 NO >> Repair or replace as necessary. Refer to <u>FAX-7</u> , " <u>Removal and Installation</u> " (front) or <u>RAX-8</u> , <u>"Wheel Bearing (Rear)"</u> (rear).
5. CHECK WHEEL SENSOR HARNESS

- Turn ignition switch OFF and disconnect malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH) and ABS actuator and electric unit (control unit) connector E26.
- Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)



Н

J

Κ

Ρ

IVDC/TCS/ABS1

	Power supply circuit		Signal circuit		Ground circuit	
Wheel	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (A)	Wheel sensor Front (B) Rear (C)	ABS actuator and electric unit (control unit) (Signal - Ground) (A)	ABS actuator and electric unit (control unit) (A) (Signal) - Body Ground
Front RH	9	1	10	2	9, 10 - 1, 4	9, 10 - Body ground
Front LH	16	1	5	2	16, 5 - 1, 4	16, 5 - Body ground
Rear RH	8	3	19	4	8, 19 - 1, 4	8, 19 - Body ground
Rear LH	6	1	17	2	6, 17 - 1, 4	6, 17 - Body ground

Power supply circuit Signal circuit Ground circuit

: Continuity should exist.

: Continuity should exist.

: Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

- NO >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

BRC-159

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

6.CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- 1. Reconnect ABS actuator and electric unit (control unit) connector.
- 2. Turn ignition switch ON and check between wheel sensor harness connector power supply terminal and ground.

Wheel	Wheel sensor	Ground	Voltage
Front RH (A)			
Front LH (A)	1		8 V or more
Rear LH (B)		_	8 4 01 11016
Rear RH (B)	3		



Is the inspection result normal?

YES >> Inspection end.

NO >> Replace ABS actuator and electric unit (control unit).

Component Inspection

INFOID:000000001342020

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-158. "Diagnosis Procedure"</u>.

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

< COMPONENT DIAGNOSIS >

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

Description

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

DTC Logic

INFOID:000000001342022

INFOID:000000001342021

DTC DETECTION LOGIC

	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)
тс сс	NFIRMATION PROC	EDURE	
.CHEC	K SELF-DIAGNOSIS F	RESULTS	
-	e self-diagnosis results		
	5		
	Self-diagnos	sis results	
	BATTERY VOLTAG	GE [ABNORMAL]	
above	displayed on the self-d	iagnosis display?	
YES NO	>> Proceed to diagnos >> INSPECTION END	is procedure. Refer to <u>BRC-161, "Diagnosis Proce</u>	edure".
liagno	sis Procedure		INFOID:000000001342023
	TION PROCEDURE		
.CHE	K CONNECTOR		
		nd disconnect ABS actuator and electric unit (
	k terminal for deformati	on, disconnection, looseness, and so on. If any m	iallunction is found, repair of
repla	ace terminal.		-
	ace terminal. onnect connector and p	erform self-diagnosis.	
. Rec	onnect connector and p pection result normal?	erform self-diagnosis.	
Rec <u>the ins</u> YES	onnect connector and p pection result normal? >> INSPECTION END	erform self-diagnosis.	
Rec the ins YES NO	onnect connector and p spection result normal? >> INSPECTION END >> GO TO 2		
. Rec the ins YES NO .CHE0	onnect connector and p pection result normal? >> INSPECTION END >> GO TO 2 CK ABS ACTUATOR A	erform self-diagnosis. ND ELECTRIC UNIT (CONTROL UNIT) POWI	ER SUPPLY CIRCUIT AND
Kec the ins YES NO CHEC ROUN	onnect connector and p pection result normal? >> INSPECTION END >> GO TO 2 CK ABS ACTUATOR A D CIRCUIT	ND ELECTRIC UNIT (CONTROL UNIT) POWI	
. Rec sthe ins YES NO .CHE(ROUN . Turr . Che	onnect connector and p <u>pection result normal?</u> >> INSPECTION END >> GO TO 2 CK ABS ACTUATOR A <u>O CIRCUIT</u> ignition switch OFF an ck voltage between AB	ND ELECTRIC UNIT (CONTROL UNIT) POWI d disconnect ABS actuator and electric unit (control S actuator and electric unit (control	
Rec the ins YES NO CHEC ROUNI Turr Che	onnect connector and p <u>pection result normal?</u> >> INSPECTION END >> GO TO 2 CK ABS ACTUATOR A <u>O CIRCUIT</u> ignition switch OFF an ck voltage between AB	ND ELECTRIC UNIT (CONTROL UNIT) POWI	rol unit) connector E26.
Rec the ins YES NO .CHEC ROUNI Turr Che	onnect connector and p <u>pection result normal?</u> >> INSPECTION END >> GO TO 2 CK ABS ACTUATOR A <u>O CIRCUIT</u> ignition switch OFF an ck voltage between AB	ND ELECTRIC UNIT (CONTROL UNIT) POWI d disconnect ABS actuator and electric unit (control S actuator and electric unit (control S terminal 18 and ground.	
Rec the ins YES NO .CHEC ROUNI Turr Che	onnect connector and p <u>pection result normal?</u> >> INSPECTION END >> GO TO 2 CK ABS ACTUATOR A <u>O CIRCUIT</u> ignition switch OFF an ck voltage between AB	ND ELECTRIC UNIT (CONTROL UNIT) POWI d disconnect ABS actuator and electric unit (control S actuator and electric unit (control	rol unit) connector E26.
the ins the ins YES NO CHE(ROUNI . Turr . Che	onnect connector and p <u>pection result normal?</u> >> INSPECTION END >> GO TO 2 CK ABS ACTUATOR A <u>O CIRCUIT</u> ignition switch OFF an ck voltage between AB	ND ELECTRIC UNIT (CONTROL UNIT) POWI d disconnect ABS actuator and electric unit (control S actuator and electric unit (control S terminal 18 and ground.	rol unit) connector E26.
Rec the ins YES NO CHEC ROUNI Turr Che	onnect connector and p <u>pection result normal?</u> >> INSPECTION END >> GO TO 2 CK ABS ACTUATOR A <u>O CIRCUIT</u> ignition switch OFF an ck voltage between AB	ND ELECTRIC UNIT (CONTROL UNIT) POWI d disconnect ABS actuator and electric unit (control S actuator and electric unit (control S terminal 18 and ground.	rol unit) connector E26.
Rec the ins YES NO .CHEC ROUNI Turr Che	onnect connector and p <u>pection result normal?</u> >> INSPECTION END >> GO TO 2 CK ABS ACTUATOR A <u>O CIRCUIT</u> ignition switch OFF an ck voltage between AB	ND ELECTRIC UNIT (CONTROL UNIT) POWI d disconnect ABS actuator and electric unit (control S actuator and electric unit (control S terminal 18 and ground.	rol unit) connector E26.
Rec the ins YES NO CHEC ROUNI Turn Che	onnect connector and p <u>pection result normal?</u> >> INSPECTION END >> GO TO 2 CK ABS ACTUATOR A <u>O CIRCUIT</u> ignition switch OFF an ck voltage between AB	ND ELECTRIC UNIT (CONTROL UNIT) POWI d disconnect ABS actuator and electric unit (control S actuator and electric unit (control S terminal 18 and ground.	rol unit) connector E26.

[VDC/TCS/ABS]

A	1	٨
	ľ	

В

С

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and electric unit (control unit)	Ground	Condition	Voltage
		Ignition switch ON	Battery voltage (Approx. 12 V)
		Ignition switch OFF	Approx. 0 V

- 3. Turn ignition switch OFF.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4	_	Yes

Is the inspection result normal?

NO

- YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
 - >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".



C1110, C1153, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < COMPONENT DIAGNOSIS > [VDC/TCS/ABS]

C1110, C1153, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Logic

INFOID:000000001342024

А

В

DTC DETECTION LOGIC

	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).	
C1153	EMERGENCY BRAKE	When ABS actuator and electric unit (control unit) is mal- functioning. (Pressure increase is too much or too little)	ABS actuator and electric unit (control unit)
C1170	VARIANT CODING	In a case where VARIANT CODING is different.	
отс сс	NFIRMATION PROCE	EDURE	
1.снес	CK SELF-DIAGNOSIS RE	ESULTS	
Check th	e self-diagnosis results.		
	Self-diagnosis	s results	
	CONTROLLER		
	EMERGENCY		
	VARIANT CO		
<u>is above</u> YES	displayed on the self-dia	procedure. Refer to <u>BRC-163</u> , "Diagnosis Proce	duro"
NO	>> INSPECTION END	procedure. Refer to <u>brossie blaghosis rioce</u>	<u>uure</u> .
Diagna			
Jiaunu	isis Procedure		INFOID:00000001342025
_	sis Procedure		INFOID:000000001342025
INSPEC	TION PROCEDURE		INFOID:000000001342025
INSPEC	TION PROCEDURE ACE ABS ACTUATOR A	ND ELECTRIC UNIT (CONTROL UNIT)	INFOID:000000001342025
INSPEC 1.REPL CAUTIO Replace	TION PROCEDURE ACE ABS ACTUATOR A N:	ND ELECTRIC UNIT (CONTROL UNIT)	
INSPEC 1.REPL CAUTIO Replace	TION PROCEDURE ACE ABS ACTUATOR A N: ABS actuator and elec t applicable.		
NSPEC 1.REPL CAUTIO Replace than tha	TION PROCEDURE ACE ABS ACTUATOR A N: ABS actuator and elec t applicable.	ctric unit (control unit) when self-diagnostic	
NSPEC 1.REPL CAUTIO Replace than tha	TION PROCEDURE ACE ABS ACTUATOR A N: ABS actuator and elect t applicable. >> Replace ABS actuato I Repair Requireme	ctric unit (control unit) when self-diagnostic	result shows items other
INSPEC 1. REPL CAUTIO Replace than tha Specia 1. ADJU Always p	TION PROCEDURE ACE ABS ACTUATOR A N: ABS actuator and elect t applicable. >> Replace ABS actuator I Repair Requireme STMENT OF STEERING perform the neutral positio	ctric unit (control unit) when self-diagnostic or and electric unit (control unit).	result shows items other
INSPEC 1. REPL CAUTIO Replace than tha Specia 1. ADJU Always p	TION PROCEDURE ACE ABS ACTUATOR A N: ABS actuator and elect t applicable. >> Replace ABS actuator I Repair Requireme STMENT OF STEERING perform the neutral positio	ctric unit (control unit) when self-diagnostic or and electric unit (control unit). ent S ANGLE SENSOR NEUTRAL POSITION on adjustment for the steering angle sensor, whe	result shows items other

Ρ

DTC C1111 PUMP MOTOR

< COMPONENT DIAGNOSIS >

DTC C1111 PUMP MOTOR

Description

INFOID:000000001342027

[VDC/TCS/ABS]

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

INFOID:000000001342028

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1111		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
onn		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 <u>BRC-164, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001342029

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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.

Is the inspection result normal?

YES >> Inspection end.

2. CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.

DTC C1111 PUMP MOTOR

< COMPONENT DIAGNOSIS >

 Check voltage between the ABS actuator and electric unit (control unit) harness connector E26 terminal 2 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
2	_	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3

NO

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4		Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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 (Note)	ON	ON

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-164, "Diagnosis Procedure"</u>.



OFF



INFOID:000000001342030

- J
- Κ

L

[VDC/TCS/ABS]

А

0

Ν

Ρ

< COMPONENT DIAGNOSIS >

DTC C1114 MAIN RELAY

Description

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

DTC Logic

INFOID:000000001342032

INFOID:000000001342033

INFOID:000000001342031

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1114	C1114 MAIN RELAY	During the actuator relay operating with OFF, when the actuator relay turns ON, or when the control line for the relay is shorted to the ground.	 Harness or connector ABS actuator and electric unit
01114		During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open.	(control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

MAIN RELAY

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-166, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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.

Is the inspection result normal?

YES >> Inspection end.

2. Check solenoid and actuator relay power supply circuit

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.
- 2. Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
3	—	Battery voltage (Approx. 12 V)

Is the inspection result normal?

- YES >> GO TO 3
- NO >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".



BRC-166

OTC C1114 MAIN RELAY < COMPONENT DIAGNOSIS >

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4	—	Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection

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 (Note)	ON	ON

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-166, "Diagnosis Procedure"</u>.



Н

Κ

L

Μ

Ν

Ρ

[VDC/TCS/ABS]

INFOID:000000001342034

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< COMPONENT DIAGNOSIS >

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

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

INFOID:000000001342036

INFOID:000000001342035

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-168, "Diagnosis Procedure"</u>.

NO >> Inspection end.

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CHECK TIRE

Check air pressure, wear and size.

Are air pressure, wear and size within standard?

- YES >> GO TO 2
- NO >> Adjust air pressure, or replace tire.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

2.CHECK SENSOR AND SENSOR ROTOR

Check sensor rotor for damage.

• Check wheel sensor for damage, disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 3 NO >> • Repair w

>> • Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

3. CHECK CONNECTOR

- Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26 and malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH). Check terminal to see if it is deformed, disconnected, loose, etc., Repair or replace it if any malfunction condition is found.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-148</u>, "CONSULT-III Function (<u>ABS</u>)".

Is the inspection result normal?

YES >> Inspection end.

BRC-168

INFOID:000000001342037

[VDC/TCS/ABS]

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

Signal circuit

Wheel sensor

Front (B)

Rear (C)

2

2

4

2

(A)

9, 10 - 1, 4

16, 5 - 1, 4

8, 19 - 1, 4

6, 17 - 1, 4

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

А

В

D

Н

Κ

L

Μ

Ν

Ρ

INFOID:000000001342038

NO >> GO TO 4

4.CHECK WHEEL SENSOR HARNESS

- Turn ignition switch OFF and disconnect malfunctioning wheel sensor connector E41 (FR-RH), E19 (FR-LH), B43 (RR-RH and RR-LH) and ABS actuator and electric unit (control unit) connector E26.
- 2. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Wheel sensor

Front (B)

Rear (C)

1

1

3

1

Power supply circuit



ALFIA0004ZZ E Ground circuit ABS actuator and electric unit (control unit) (Signal - Ground) (Signal) - Body Ground

9, 10 - Body ground

16, 5 - Body ground

8, 19 - Body ground

6, 17 - Body ground

Power supply circuit Signal circuit

ABS actuator

and electric unit

(control unit)

(A)

9

16

8

6

- Ground circuit
- : Continuity should exist. : Continuity should not exist.

ABS actuator

and electric unit

(control unit)

(A)

10

5

19

17

: Continuity should exist.

Is the inspection result normal?

YES >> GO TO 5 NO >> • Repair of

Wheel

Front RH

Front LH

Rear RH

Rear LH

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

5. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

- 1. Replace wheel sensor that resulted in malfunction by self-diagnosis.
- Reconnect connectors, drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is above displayed on the self-diagnosis display?

- YES >> Inspection end. NO >> • Replace ABS
 - >> Replace ABS actuator and electric unit (control unit).
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection

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

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

RR RH SENSOR

FR RH SENSOR

Nearly matches the speedometer display (±10% or less)

Is the inspection result normal?

YES >> Inspection end.

NO >> Go to diagnosis procedure. Refer to <u>BRC-168. "Diagnosis Procedure"</u>.

DTC C1116 STOP LAMP SW

< COMPONENT DIAGNOSIS >

DTC C1116 STOP LAMP SW

Description

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

DTC Logic

INFOID:000000001342040

INFOID:000000001342039

А

С

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected conditi	on Possible cause	D
C1116	STOP LAMP SW	When stop lamp switch circuit is open.	 Harness or connector Stop lamp switch ABS actuator and electric unit (control unit) 	Е
DTC CO	ONFIRMATION PROC	EDURE		
1.сне	CK SELF-DIAGNOSIS F	RESULTS		BRC
Check t	he self-diagnosis results			
				G
	Self-diagnos			
	STOP LAMP			Н
	e displayed on the self-di			
YES NO	>> Proceed to diagnosi >> INSPECTION END	s procedure. Refer to <u>BRC-171, "Dia</u>	gnosis Procedure".	
Diagrit	osis Procedure		INFOID:00000001342041	
INSPEC	TION PROCEDURE			J
1. CHE	CK CONNECTOR			
unit any	(control unit) connector malfunction is found, re	E26, check terminal for deformation pair or replace terminal.	ector E38 and ABS actuator and electric , disconnection, looseness, and so on. If	K
3. Star 4. Rep	connect connectors secu rt engine. Deat pumping brake peda spection result normal?	rely. al carefully several times, and perforn	n self-diagnosis.	L
YES	>> Inspection end.			M
NO	>> GO TO 2			
Z.CHE	CK STOP LAMP SWITC	HCIRCUIT		
		d disconnect ABS actuator and electr	ic unit (control unit) connector E26.	Ν
		S actuator and electric unit (control terminal 20 and ground.		0
				D
				Р
			ALFIA0016ZZ	

DTC C1116 STOP LAMP SW

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and electric unit (control unit)	Ground	Condition	Voltage
20		Brake pedal depressed	Battery voltage (Approx. 12 V)
20		Brake pedal not depressed	Approx. 0V

Is the inspection result normal?

YES >> Perform self-diagnosis.

>> • Repair or replace stop lamp switch circuit.

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection

NO

INFOID:000000001342042

1.CHECK STOP LAMP SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect stop lamp switch connector.

3. Check continuity between stop lamp switch connector terminals.

Stop lan	np switch	Condition	Continuity	
Connector	Terminals	Condition	Continuity	
E38	1 – 2	Release stop lamp switch (When brake pedal is depressed.)	Yes	
230	1 – 2	Push stop lamp switch (When brake pedal is released.)	No	

Is the inspection result normal?

YES >> INSPECTION END.

NO >> Replace stop lamp switch.

SPECIAL REPAIR REQUIREMENT

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-142</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"</u>.

>> END

C1120, C1122, C1124, C1126 IN ABS SOL

Description

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

< COMPONENT DIAGNOSIS >

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)	В
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH inlet solenoid circuit.		
DTC CC	NFIRMATION PROCE	DURE		
1. CHEC	CK SELF-DIAGNOSIS RE	SULTS		
Check th	e self-diagnosis results.			
	Self-diagnosis	results		
	FR LH IN ABS	SOL		
	FR RH IN ABS	SSOL		
	RR LH IN ABS	S SOL		
	RR RH IN AB	S SOL		
ls above	displayed on the self-diag	anosis display?		
YES		procedure. Refer to <u>BRC-173, "Diagnosis Proce</u>	dure".	
Diagno	eis Procedure			

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR Μ Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 1. check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal. Ν Reconnect connector and perform self-diagnosis. Is the inspection result normal? YES >> Inspection end. >> GO TO 2 NO 2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT Ρ Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26. 1.

INFOID:000000001342043

INFOID:000000001342044

INFOID:000000001342045

L

А

В

< COMPONENT DIAGNOSIS >

 Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
3	—	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3 NO >> • Repair of

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4	_	Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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.

NOTE:

The example below is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Note)		ABS solenoid valve	
Operation (Note)	UP	KEEP	DOWN
FR RH IN SOL	OFF	ON	ON
FR RH OUT SOL	OFF	OFF	ON*

*: ON for 1 to 2 seconds after the touch, and then OFF.

NOTE:

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

Is the inspection result normal?

YES >> Inspection end.

NO >> Go to diagnosis procedure. Refer to <u>BRC-173. "Diagnosis Procedure"</u>.





INFOID:000000001342046

[VDC/TCS/ABS]

<u>< COMPONENT DIAGNOSIS ></u> C1121, C1123, C1125, C1127 OUT ABS SOL

Description

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	D
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	ABS actuator and electric unit	E	
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	(control unit)	BR
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.		
DTC CO	NFIRMATION PROCE	DURE		G
1. CHEC	K SELF-DIAGNOSIS RE	SULTS		
Check th	e self-diagnosis results.			Н
	Self-diagnosis	results		
	FR LH OUT AB	S SOL		
	FR RH OUT AE	IS SOL		
	RR LH OUT AB	IS SOL		. I
	RR RH OUT AE	3S SOL		0

Is above displayed on the self-diagnosis display?

YES	>> Proceed to diagnosis procedure. Refer to <u>BRC-175, "Diagnosis Procedure"</u> .
	>> Inspection end.

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1.	Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or	
2.	replace terminal. Reconnect connector and perform self-diagnosis.	Ν

Is the inspection result normal?

YES >> Inspection end.

NO >> GO TO 2

2. CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.

C1121, C1123, C1125, C1127 OUT ABS SOL

BRC-175

[VDC/TCS/ABS]

А

В

Κ

L

Μ

0

Ρ

INFOID:000000001342049

INFOID:000000001342047

INFOID:000000001342048

< COMPONENT DIAGNOSIS >

2. Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
3	—	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3 NO >> • Repair of

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4	_	Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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.

NOTE:

The example below is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Note)	ABS solenoid valve		
	UP	KEEP	DOWN
FR RH IN SOL	OFF	ON	ON
FR RH OUT SOL	OFF	OFF	ON*

*: ON for 1 to 2 seconds after the touch, and then OFF.

NOTE:

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

Is the inspection result normal?

- YES >> Inspection end.
- NO >> Go to diagnosis procedure. Refer to <u>BRC-175. "Diagnosis Procedure"</u>.





INFOID:000000001342050

[VDC/TCS/ABS]

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description

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

DTC Logic

INFOID:000000001342052

INFOID:000000001342051

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1130	ENGINE SIGNAL 1			
C1131	ENGINE SIGNAL 2		 Harness or connector ABS actuator and electric unit 	_
C1132	ENGINE SIGNAL 3	Major engine components are malfunctioning.	(control unit)	E
C1133	ENGINE SIGNAL 4		ECMCAN communication line	
C1136	ENGINE SIGNAL 6		China communication into	BRC
DTC CC	NFIRMATION PROCE	DURE		
1. CHEC	CK SELF-DIAGNOSIS RE	SULTS		0
	e self-diagnosis results.			G
	Self-diagnosis	results		Н
	ENGINE SIG	NAL 1		
	ENGINE SIG	NAL 2		1
ENGINE SIGNAL 3				
	ENGINE SIG	NAL 4		
	ENGINE SIG	NAL 6		J
Is above	displayed on the self-diag	gnosis display?		
	>> Proceed to diagnosis >> INSPECTION END	procedure. Refer to <u>BRC-177, "Diagnosis Proce</u>	edure".	Κ
Diagno	sis Procedure		INFOID:000000001342053	
INSPEC	TION PROCEDURE			L
1. CHEC	CK ENGINE SYSTEM			
1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again.				
Refe	er to EC-1012, "Work Flow	<u>/"</u> .		
		ctric unit (control unit) self-diagnosis.		Ν
	spection result normal? > Inspection end.			IN
	>> • Repair or replace m	alfunctioning components. gnosis, and make sure that the result shows "No	O DTC IS DETECTED".	0
Specia	I Repair Requireme	-	INFOID:000000001342054	
				Р
	L REPAIR REQUIREM			4
.ADJU	ISTMENT OF STEERING	ANGLE SENSOR NEUTRAL POSITION		

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-142</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Description".

BRC-177

[VDC/TCS/ABS]

А

С

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

>> END

< COMPONENT DIAGNOSIS >

DTC C1142 PRESS SEN CIRCUIT

Description

The pressure sensor converts the brake fluid pressure to an electric signal and transmits it to the ABS actuator and electric unit (control unit). (The pressure sensor is integrated in the ABS actuator and electric unit (control unit).)

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1142	PRESS SEN CIRCUIT	Pressre sensor signal line is open or shorted, or pressre sensor is malfunctioning.	 Harness or connector Stop lamp switch ABS actuator and electric unit (control unit) 	E
DTC CC	ONFIRMATION PROC	EDURE		BR
1. CHEC	CK SELF-DIAGNOSIS R	ESULTS		
Check th	ne self-diagnosis results.			0
	_			G
	Self-diagnos	is results		
	PRESS SEN			Η
	displayed on the self-di			
YES NO	>> Proceed to diagnosis >> INSPECTION END	s procedure. Refer to <u>BRC-179. "Diagnosis Proce</u>	<u>dure"</u> .	Ι
Diagno	sis Procedure		INFOID:000000001342057	
	TION PROCEDURE			J
	CK STOP LAMP SWITC	HCONNECTOR		K
 Turn ignition switch OFF. Disconnect ABS actuator and electric unit (control unit) connector. 				I.
3. Disc	onnect stop lamp switch	connector.		
	ck terminal for deformati ace terminal.	on, disconnection, looseness, and so on. If any m	alfunction is found, repair or	L
	onnect connectors secu	rely.		
	t engine.			M
 Repeat pumping brake pedal carefully several times, and perform self-diagnosis. Is the inspection result normal? 				
YES	>> GO TO 2			
NO				Ν
2.снес	CK STOP LAMP SWITC	Н		
1. Turn	ignition switch OFF.			0
2. Disc	connect stop lamp switch	connector.		

3. Check continuity between stop lamp switch connector terminals.

Stop lamp switch		Condition Continuity	Continuity	• F
Connector	Terminal	Condition	Continuity	
E38 1	1-2	Release stop lamp switch (When brake pedal is depressed.)	Yes	
	1 – 2	Push stop lamp switch (When brake pedal is released.)	No	-

А

В

С

INFOID:000000001342055

INFOID:000000001342056

DTC C1142 PRESS SEN CIRCUIT

< COMPONENT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3

NO >> Replace stop lamp switch.

3.CHECK STOP LAMP SWITCH CIRCUIT

- 1. Disconnect ABS actuator and electric unit (control unit) connector.
- 2. Connect stop lamp switch connector.
- 3. 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	Condition	vollage
E26	20	Brake pedal is depressed	Battery voltage
		Brake pedal is released	Approx. 0 V

Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace malfunctioning components.

4.CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results

PRESS SEN CIRCUIT

Is above displayed on the self-diagnosis display?

YES >> • Replace ABS actuator and electric unit (control unit).

• Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

NO >> Inspection end.

Component Inspection

1.CHECK DATA MONITOR

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

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.	- 40 to 300 bar

Is the inspection result normal?

YES >> INSPECTION END

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

Special Repair Requirement

INFOID:000000001342059

INEOID:000000001342058

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-142</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"</u>.

>> END
C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

C1143, C1144 STEERING ANGLE SENSOR

Description

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

INFOID:000000001342061

INEOID:000000001342062

INFOID:000000001342060

А

BRC

Н

Κ

L

Μ

Ν

Ρ

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1143	ST ANG SEN CIRCUIT	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	 Steering angle sensor 	
C1144	ST ANG SEN SIGNAL	Neutral position of steering angle sensor is not finished.	ABS actuator and electric unit (control unit)	E

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results

ST ANG SEN CIRCUIT

Is above displayed on the self-diagnosis display?

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

NO >> INSPECTION END

Diagnosis Procedure

INSPE	CTION	PROCE	DURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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.

Is the inspection result normal?

- YES >> Inspection end.
- NO >> GO TO 2

2. CHECK STEERING ANGLE SENSOR HARNESS

- 1. Check CAN communication system. Refer to LAN-16, "Trouble Diagnosis Flow Chart".
- 2. Turn ignition switch OFF and disconnect steering angle sensor connector.
- Check continuity between steering angle sensor harness connector M53 terminal 1 and ground.

Steering angle sensor	Ground	Continuity
1	—	Yes



[VDC/TCS/ABS]

4. Turn ignition switch ON and check voltage between steering angle sensor harness connector M53 terminal 4 and ground.

Steering angle sensor	Ground	Voltage
4	—	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3

NO

>> • Repair or replace malfunctioning components.

 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

3.CHECK DATA MONITOR

- 1. Turn ignition switch OFF and 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 ° to + 2.5 °
Turn 90° to right	Approx.+ 90 °
Turn 90° to left	Approx.– 90 °

Is the inspection result normal?

YES >> Perform self-diagnosis.

- NO >> Replace spiral cable (steering angle sensor) and adjust neutral position of steering angle sensor. Refer to <u>BRC-241, "Removal and Installation"</u>.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection

INFOID:000000001342063

INFOID:000000001342064

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 <u>BRC-181, "Diagnosis Procedure"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-241</u>, "<u>Removal and Installation</u>".

C1145, C1146 YAW RATE/SIDE G SENSOR

< COMPONENT DIAGNOSIS >

C1145, C1146 YAW RATE/SIDE G SENSOR

Description

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

DTC Logic

INFOID:000000001342066

INFOID:000000001342065

А

BRC

Н

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-183, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

- Sudden turns (such as spin turns, acceleration turns), drifting, etc., when VDC function is off (VDC OFF switch "ON") may cause yaw rate/side/decel G sensor system to indicate a malfunction. How-Κ ever, this is not a malfunction, if normal operation can be resumed after restarting engine. Then erase memory of self-diagnosis.
- 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 mal-L function. 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. And after doing spin turns or acceleration turns with VDC function is being off (VDC OFF switch "ON"), too, the Μ results will return to a normal condition by re-starting vehicle.

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect yaw rate/side/decel G sensor connector M55 and ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connector and perform self-diagnosis.

Is the inspection result normal?

- YES >> Inspection end.
- NO >> GO TO 2

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

BRC-183

INFOID:000000001342067

Ρ

Ν

C1145, C1146 YAW RATE/SIDE G SENSOR

< COMPONENT DIAGNOSIS >

Turn ignition switch ON, then OFF and check voltage between yaw rate/side/decel G sensor harness connector M55 terminal 4 and ground.



[VDC/TCS/ABS]

Yaw rate/side/decel G sensor	Ground	Condition	Voltage
		Ignition switch ON	Battery voltage (Approx. 12 V)
7		Ignition switch OFF	Approx. 0V

Is the inspection result normal?

YES >> GO TO 3 NO >> • Repair o

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

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

Turn ignition switch OFF and check resistance between yaw rate/ side/decel G sensor harness connector M55 terminal 1 and ground.

Yaw rate/side/decel G sensor	Ground	Condition	Continuity
1		Ignition switch OFF	Yes



Is the inspection result normal?

YES >> GO TO 4

NO

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

4.CHECK YAW RATE/SIDE/DECEL G SENSOR HARNESS

 Check continuity between ABS actuator and electric unit (control unit) harness connector (A) E26 and yaw rate/side/decel G sensor harness connector (B) M55.

ABS actuator and electric unit (control unit)	Yaw rate/side/decel G sensor	Continuity
14	2	Yes
25	3	163

2. Check continuity between ABS actuator and electric unit (control unit) harness connector (A) E26 and ground.



C1145, C1146 YAW RATE/SIDE G SENSOR

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

14		No	
25	—	INO	_

Is the inspection result normal?

YES >> GO TO 5

NO

- >> Repair or replace malfunctioning components.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

5.CHECK DATA MONITOR

- 1. Connect the Yaw rate/side/decel G sensor connector and ABS actuator and electric unit (control unit) connector.
- Select "YAW RATE SEN", "SIDE G-SENSOR" in "Data Monitor" and check Yaw rate/side/decel G sensor signal.

Vehicle condition	Yaw rate sensor (Data monitor)	Side G sensor (Data monitor)	
Stopped	Approx. 0 d/s	Approx. 0 m/s ²	BRC
Turning right	Negative value	Negative value	
Turning left	Positive value	Positive value	G

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Replace Yaw rate/side/decel G sensor.
 - Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection

INFOID:000000001342068

INFOID:000000001342069

D

Е

1.CHECK DATA MONITOR

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

Vehicle condition	YAW RATE SEN (DATA MONITOR)	SIDE G-SENSOR (DATA MONITOR)	k
Stopped	Approx. 0 d/s	Approx. 0 m/s ²	-
Turning right	Negative value	Negative value	L
Turning left	Positive value	Positive value	_

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-183, "Diagnosis Procedure"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-241, "Removal and Installation"</u>.

>> END

Ρ

Μ

Ν

C1147, C1148, C1149, C1150 USV/HSV LINE

< COMPONENT DIAGNOSIS >

C1147, C1148, C1149, C1150 USV/HSV LINE

Description

USV1, USV2 (CUT VALVE) The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

HSV1, HSV2 (SUCTION VALVE)

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

DTC Logic

INFOID:000000001342071

INFOID:000000001342070

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1147	USV LINE[FL-RR]	VDC switch-over solenoid valve (USV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	
C1148	USV LINE[FR-RL]	VDC switch-over solenoid valve (USV2) 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
C1149	HSV LINE[FL-RR]	VDC switch-over solenoid valve (HSV1) 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)
C1150	HSV LINE[FR-RL]	VDC switch-over solenoid valve (HSV2) 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
USV LINE[FL-RR]
USV LINE[FR-RL]
HSV LINE[FL-RR]
HSV LINE[FR-RL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-186, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 1. 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.

Is the inspection result normal?

- YES >> Inspection end. NO
- >> GO TO 2

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

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26. 1.

BRC-186

C1147, C1148, C1149, C1150 USV/HSV LINE

< COMPONENT DIAGNOSIS >

 Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
3	_	Battery voltage (Approx. 12 V)

Is the inspection result normal?

YES >> GO TO 3

NO

>> • Repair or replace malfunctioning components.



3. CHECK SOLENOID, VDC CHANGE-OVER VALVE, ACTUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) harness connector E26 terminal 1, 4 and ground.

ABS actuator and electric unit (control unit)	Ground	Continuity
1, 4		Yes

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".
- NO >> Repair or replace malfunctioning components.
 Perform the self-diagnosis, and make sure that the result shows "NO DTC IS DETECTED".

Component Inspection

1.CHECK ACTIVE TEST

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

NOTE:

The example shown is for front right wheel. The procedure for the other wheels is the same as given below.

Operation (Nate)		ABS solenoid valve (ACT)		L
Operation (Note)	UP	ACT UP	ACT KEEP	-
FR RH IN SOL	OFF	OFF	OFF	M
FR RH OUT SOL	OFF	OFF	OFF	-
USV [FR-RL]	OFF	ON	ON	-
HSV [FR-RL]	OFF	ON*	OFF	Ν

*: ON for 1 to 2 seconds after the touch, and then OFF.

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-186, "Diagnosis Procedure"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION





INFOID:000000001342073

J

Κ

Ρ

INFOID:000000001342074

BRC-187

[VDC/TCS/ABS]

А

В

D

C1147, C1148, C1149, C1150 USV/HSV LINE

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-142</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: <u>Description</u>".

>> END

< COMPONENT DIAGNOSIS >

DTC C1154 PNP POS SIG

Description

The park/neutral position switch signal is transmitted to the ABS actuator and electric unit (control unit) using the CAN communication lines.

DTC Logic

INFOID:000000001342076

INFOID:000000001342075

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1154	PNP POS SIG	Park/Neutral position signal or communication line be- tween the ABS actuator and electric unit (control unit) and TCM is open or shorted.	Harness or connectorPNP switch	E
DTC CC	ONFIRMATION PROCE	DURE		
1. CHE0	CK SELF-DIAGNOSIS RE	SULTS		BRC
Check th	ne self-diagnosis results.			BNC
	Self-diagnosis	results		G
	PNP POS S	SIG		
	displayed on the self-diag			Н
YES NO	>> Proceed to diagnosis p >> INSPECTION END	procedure. Refer to <u>BRC-189, "Diagnosis Proce</u>	<u>dure"</u> .	
Diagno	sis Procedure		INFOID:00000001342077	
	TION PROCEDURE			
I.CHE	CK DATA MONITOR			J
Select "	SLCT LVR POSI" in "Data	Monitor" and check Park/Neutral position switch	h signal.	
				K
	Selector lever position	SLCT LVR POSI (Data monitor)		
	P position	P		
	R position	R		L
	N position	Ν		
	D position	D		в. Л
Is the ins	spection result normal?			M
YES		or and electric unit (control unit).		
No		gnosis, and make sure that the result shows "No	O DTC IS DETECTED".	Ν
NO	>> GO TO 2			
Z.CHE	CK PARK/NEUTRAL POS	ITION (PNP) SWITCH		
Perform	Park/Neutral position swite	ch inspection. Refer to <u>TM-129, "Description"</u> .		0
Is the ins	spection result normal?			
YES		or and electric unit (control unit).		
NO		gnosis, and make sure that the result shows "No alfunctioning components.	DIC IS DETECTED".	Ρ
NU		gnosis, and make sure that the result shows "No	O DTC IS DETECTED".	
			· · · · · · · · · · · · · · · · · · ·	

А

С

< COMPONENT DIAGNOSIS >

DTC C1155 BR FLUID LEVEL LOW

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 connectorBrake fluid level switch

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 <u>BRC-190, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001342080

CAUTION:

Check brake fluid level in brake reservoir tank before starting inspection.

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- Turn ignition switch OFF and disconnect brake fluid level switch connector E24 and combination meter connector M24, 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.

Is the inspection result normal?

YES >> Inspection end. NO >> GO TO 2

 $\mathbf{2}$

2.CHECK BRAKE FLUID LEVEL SWITCH

1. Turn ignition switch OFF and disconnect brake fluid level switch connector E24.

2. Check continuity between brake fluid level switch connector E24 terminals 1 and 2.



INFOID:000000001342078

DTC C1155 BR FLUID LEVEL LOW

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Brake fluid level switch	Condition	Continuity
1, 2	When brake fluid is full in the reservoi	r tank. No
1, 2	When brake fluid is empty in the reserv	oir tank. Yes
<u>View"</u> . • Perform the self-dia CHECK BRAKE FLUID LEVEL	gnosis, and make sure that the result SWITCH HARNESS	ervoir tank. Refer to <u>BR-33, "Exploded</u> shows "NO DTC IS DETECTED".
terminal 27 and brake fluid lev nal 1.	nbination meter connector M24 (A) vel switch connector E24 (B) termi-	
 27 - 1 Check continuity between cor terminal 27 and ground. 	: Continuity should exist. nbination meter connector M24 (A)	
27 - Ground	: Continuity should not exist.	
	alfunctioning components. gnosis, and make sure that the result	shows "NO DTC IS DETECTED".
1. CHECK BRAKE FLUID LEVEL	SWITCH GROUND CIRCUIT	
Check continuity between brake f erminal 2 and ground. 2 - Ground s the inspection result normal?	uid level switch connector E24 (B)	
YES >> Brake fluid level switc NO >> • Repair or replace m • Perform the self-di	h circuit is OK. alfunctioning components. agnosis, and make sure that the TC IS DETECTED".	
Component Inspection	L	ALFIA0028ZZ INFOID:000000001342081
1. CHECK BRAKE FLUID LEVEL	SWITCH	
 Turn ignition switch OFF. Disconnect brake fluid level s 		als.

Brake fluid level switch		Condition	Continuity	0
Connector	Terminals	Condition	Continuity	
E24	1 2	When brake fluid is full in the reservoir tank.	No	Р
E24	E24 1 – 2	When brake fluid is empty in the reservoir tank.	Yes	

Is the inspection result normal?

YES >> INSPECTION END.

NO >> Replace reservoir tank.

DTC C1155 BR FLUID LEVEL LOW

< COMPONENT DIAGNOSIS >

Special Repair Requirement

INFOID:000000001342082

[VDC/TCS/ABS]

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-241</u>, "<u>Removal and Installation</u>".

>> END

< COMPONENT DIAGNOSIS >

DTC C1156 ST ANG SEN COM CIR

Description

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

INFOID:000000001342084

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 	BRC
			(control unit)	G
DTC CC	NFIRMATION PROCE	DURE		

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 <u>BRC-193, "Diagnosis Procedure"</u>. NO >> INSPECTION END 	J
Diagnosis Procedure	К
INSPECTION PROCEDURE	
1.CHECK CONNECTOR	L
 Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal. Reconnect connector and perform self-diagnosis. 	Μ
Self-diagnosis results	Ν
CAN COMM CIRCUIT	
ST ANG SEN COM CIR	\bigcirc
Is above displayed on the self-diagnosis display?	0
YES >> Refer to <u>LAN-6. "Precautions for Trouble Diagnosis"</u> . NO >> Inspection end.	Ρ

А

D

Е

Н

U1000 CAN COMM CIRCUIT

Description

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

DTC Logic

INFOID:000000001342087

INFOID:000000001342088

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

INSPECTION PROCEDURE

1.CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, 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

Is above displayed on the self-diagnosis display?

- YES >> Refer to LAN-6, "Precautions for Trouble Diagnosis".
- NO >> Inspection end.

PARKING BRAKE SWITCH

< COMPONENT DIAGNOSIS >

PARKING BRAKE SWITCH

Description

The parking brake switch converts the status of the parking brake pedal to an electric signal and transmits it to the combination meter. Then, through CAN communication, the signal is carried to the ABS actuator and electric unit (control unit).

Component Function Check

1. CHECK PARKING BRAKE SWITCH OPERATION

Operate the parking brake. Then check that the brake warning lamp in the combination meter turns on/off cor-D rectly.

Condition	Brake warning lamp illumination status
When the parking brake is engaged	ON
When the parking brake is not engaged	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to <u>BRC-195, "Diagnosis Procedure"</u>.

Diagnosis Procedure

1. CHECK PARKING BRAKE SWITCH CIRCUIT

- 1. Disconnect combination meter connector and parking brake switch connector.
- Check continuity between combination meter harness connector 2. M24 (A) terminal 26 and parking brake switch harness connector M73 (B) terminal 1.

26 - 1

: Continuity should exist.

3. Check continuity between combination meter harness connector M24 (A) terminal 26 and ground.

26 - Ground

: Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair harness or connector.

2.CHECK PARKING BRAKE SWITCH

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

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

Is the inspection result normal?

YES >> Check parking brake switch case ground condition.

NO >> Replace parking brake switch.

Component Inspection

INSPECTION PROCEDURE



Ω

INFOID:000000001342089

INFOID:000000001342090

[VDC/TCS/ABS]

Е



INFOID:000000001342091



Н

Κ

AWNIA0017Z

А

PARKING BRAKE SWITCH

< COMPONENT DIAGNOSIS >

1. CHECK PARKING BRAKE SWITCH

- 1. Turn ignition switch OFF.
- 2.

Disconnect parking brake switch connector. Check continuity between parking brake switch terminal 1 and ground. 3.

Parking brake switch			Condition	Continuity
Connector	Terminal		Condition	Continuity
M73	1	Ground	When the parking brake is engaged.	Yes
1017 5	I	Ground	When the parking brake is released.	No

Is the inspection result normal?

YES >> INSPECTION END.

>> Replace parking brake switch. NO

VDC OFF SWITCH

< COMPONENT DIAGNOSIS >

VDC OFF SWITCH

Description

VDC OFF switch can deactivate (turn OFF) the VDC/TCS function by pressing the VDC OFF switch.

Component Function Check

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 <u>BRC-197, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INSPECTION PROCEDURE

1.CHECK VDC OFF SWITCH

- 1. Turn ignition switch OFF and disconnect VDC OFF switch connector M72.
- 2. Check continuity between VDC OFF switch connector M72 terminals 1 and 2.

VDC OFF switch	Condition	Continuity
1.2	VDC OFF switch ON	Yes
1, 2	VDC OFF switch OFF	No

Is the inspection result normal?

- YES >> GO TO 2 NO >> VDC OFF
 - >> VDC OFF switch is malfunctioning. Replace VDC OFF switch.

2.CHECK VDC OFF SWITCH HARNESS

- 1. Disconnect ABS actuator and electric unit (control unit) connector E26.
- Check continuity between ABS actuator and electric unit (control unit) connector E26 (A) terminal 21 and VDC OFF switch connector M72 (B) terminal 1.

ABS actuator and electric unit (control unit)	VDC OFF switch	Continuity
21	1	Yes



3. Check continuity between ABS actuator and electric unit (control unit) connector E26 (A) terminal 21 and ground.

E

D

А

В

BRC

INFOID:000000001342095

PFIA0307E



Κ



[VDC/TCS/ABS]

INFOID:000000001342093

VDC OFF SWITCH

< COMPONENT DIAGNOSIS >

ABS actuator and electric unit (control unit)	Body ground	Continuity
21	Ground	No

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK VDC OFF SWITCH GROUND

Check continuity between VDC OFF switch connector M72 terminal 2 and ground.

VDC OFF switch	Body ground	Continuity
2	Ground	Yes



Is the inspection result normal?

- YES >> Inspection end.
- NO >> Repair or replace malfunctioning components.

Component Inspection

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 connector terminals.

VDC OF	FF switch	Condition	Continuity	
Connector	Terminals			
M72	1 – 2	When VDC OFF switch is pressed ON.	Exists	
		When VDC OFF switch is released OFF.	Does not exist	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VDC OFF switch.

ABS WARNING LAMP

< COMPONENT DIAGNOSIS >

ABS WARNING LAMP

Description

INFOID:000000001342097

Condition	×: 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:000000001342098
1. CHECK ABS WARNING LAMP OPERATION	
Check that the lamp illuminates for approximately 1 sec	cond after the ignition switch is turned ON.
Is the inspection result normal?	
YES >> INSPECTION END	
NO >> Go to diagnosis procedure. Refer to <u>BRC-1</u>	<u>99. Diagnosis Procedure</u> .
Diagnosis Procedure	INFOID:000000001342099
1.CHECK SELF-DIAGNOSIS	
Perform ABS actuator and electric unit (control unit) sel	f-diagnosis. Refer to BRC-148, "CONSULT-III Function
<u>(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 me	ptor are normal. Refer to MWL 4. "Work Flow"
Is the inspection result normal?	
YES >> Replace ABS actuator and electric unit (cor	ntrol unit).
NO >> Repair or replace combination meter.	

[VDC/TCS/ABS]

А

Ρ

BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

BRAKE WARNING LAMP

Description

INFOID:000000001342100

×: 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

1.BRAKE WARNING 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 <u>BRC-200, "Diagnosis Procedure"</u>.

2.BRAKE WARNING LAMP OPERATION CHECK 2

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brakes.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check parking brake switch. Refer to <u>MWI-49</u>, "Description".

Diagnosis Procedure

1.CHECK PARKING BRAKE SWITCH

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brakes.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check parking brake switch. Refer to <u>MWI-49</u>, "Description".

2. CHECK SELF-DIAGNOSIS

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

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 <u>MWI-4, "Work Flow"</u>. <u>Is the inspection result normal?</u>

YES >> Replace ABS actuator and electric unit (control unit).

NO >> Repair or replace combination meter.

INFOID:000000001342101

VDC OFF INDICATOR LAMP

< COMPONENT DIAGNOSIS >

VDC OFF INDICATOR LAMP

Description

INFOID:000000001342103

1.VDC OFF INDICATOR LAMP OPERATION CHECK 1 2.VDC OFF INDICATOR LAMP OPERATION CHECK 1 Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON. s the inspection result normal? YES >> GO TO 2 NO >> Go to diagnosis procedure. Refer to <u>BRC-201, "Diagnosis Procedure"</u> . 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. s the inspection result normal? YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to <u>BRC-197, "Description"</u> . Diagnosis Procedure MF0100000000000000000000000000000000000		×: ON –: OFF
For 1 second after turning ON lightion switch × 1 second later after turning ON lightion switch - VDC OFF switch turned ON. (VDC function is OFF.) × VDC/TCS function is malfunctioning. × ABS function is malfunctioning. × Component Function Check × VDC OFF INDICATOR LAMP OPERATION CHECK 1 * Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON. s. s. the inspection result normal? YES >> 60 TO 2 NO >> Go to diagnosis procedure. Refer to <u>BRC-201. "Diagnosis Procedure".</u> 2. 2. VDC OFF INDICATOR LAMP OPERATION CHECK 2 ************************************	Condition	VDC OFF indicator lamp
1 second later after turning ON ignition switch - VDC OFF switch turned ON. (VDC function is OFF.) × VDC OFF switch turned ON. (VDC function is OFF.) × ABS function is mailunctioning. × ABS function is mailunctioning. × Component Function Check * Available * Component Function Check * Available * Component Function Check * Available * Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON. * I check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON. * S the inspection result normal? YES YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to BRC-197. "Description". Diagnosis Procedure * 1. CHECK VDC OFF SWITCH * Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the //pc OFF switch. 1 set inspection result normal? YES YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to BRC-197. "Diagnosis Procedure". 2.	Ignition switch OFF	-
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 ************************************	For 1 second after turning ON ignition switch	×
VDC/TCS function is malfunctioning. × ABS function is malfunctioning. × EBD function is malfunctioning. × Component Function Check * 2 Automation is malfunctioning. × Component Function Check * 2 Automation is malfunctioning. × 2 Component Function Check * 2 Automation is malfunctioning. × 2 Component Function Check * 2 Automation is malfunctioning. × 2 Component Function Check * 2 Component Function Check * 3 the inspection result normal? * YES >> Go to diagnosis procedure. Refer to BRC-201. "Diagnosis Procedure". * 2 VDC OFF INDICATOR LAMP OPERATION CHECK 2 * 2 Sthe inspection result normal? * YES >> INSPECTION END * NO >> Check VDC OFF switch. Refer to BRC-197. "Description". * Diagnosis Procedure * * VCO OFF switch. * * s the inspec	1 second later after turning ON ignition switch	-
ABS function is mailunctioning. × EBD function is mailunctioning. × Component Function Check ************************************	VDC OFF switch turned ON. (VDC function is OFF.)	×
EBD function is mailfunctioning. × Component Function Check were concentration of the second after the ignition switch is turned ON. Subscription 1 Subscription 1 Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON. Subscription 1 Subscription 1 Subscription 1 YES > GO TO 2 NO >> Go to diagnosis procedure. Refer to BRC-201. "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. Sthe inspection result normal? YES >> Check VDC OFF switch. Refer to BRC-197. "Description". Diagnosis Procedure were concentrations A.CHECK VDC OFF SWITCH Check that the VDC OFF switch. Refer to BRC-197. "Diagnosis Procedure". Check KBLF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-148. "CONSULT-III Function ABS'. Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to MWI-4, "Work Flow". Sthe inspection result normal? YES >> GO TO 3 NO >> Check thems displayed by self-diagnosis. Refer to MWI-4, "Work Flow". Sthe inspection result normal? YES <td>VDC/TCS function is malfunctioning.</td> <td>×</td>	VDC/TCS function is malfunctioning.	×
Component Function Check Another and the second after the ignition switch is turned ON. 1. VDC OFF INDICATOR LAMP OPERATION CHECK 1 Component Function Check Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON. Sthe inspection result normal? YES >> GO TO 2 NO >> Go to diagnosis procedure. Refer to BRC-201. "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. s the inspection result normal? YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to BRC-197. "Description". Diagnosis Procedure Wrotexceenserve 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. s the inspection result normal? YES YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to BRC-197. "Diagnosis Procedure". 2. CHECK SELF-DIAGNOSIS Concert on the BRC-197. "Diagnosis Procedure". 2. CHECK SELF-DIAGNOSIS Concert on the BRC-197. "Diagnosis. Refer to BRC-148. "CONSULT-III Function ABS)". 2. CHECK SELF-DIAGNOSIS Set the inspection result normal?	ABS function is malfunctioning.	×
1. VEO OFF INDICATOR LAMP OPERATION CHECK 1 2. Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON. 3. the inspection result normal? YES > GO TO 2 NO >> Go to diagnosis procedure. Refer to <u>BRC-201, "Diagnosis Procedure".</u> 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 //CC OFF switch. 3. the inspection result normal? YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to <u>BRC-197, "Description".</u> Diagnosis Procedure	EBD function is malfunctioning.	×
1. VDC OFF INDICATOR LAMP OPERATION CHECK 1 Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON. s the inspection result normal? YES >> Go to diagnosis procedure. Refer to BRC-201. "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. s the inspection result normal? YES >> Check VDC OFF switch. Refer to BRC-197. "Description". Diagnosis Procedure wroexceccerse tos 1. CHECK VDC OFF SWITCH mroexceccerse tos 1. CHECK VDC OFF switch. Refer to BRC-197. "Diagnosis Procedure". Mroexceccerse tos 1. CHECK VDC OFF switch. s the inspection result normal? YES >> GO TO 2 Mroexceccerse tos 1. CHECK VDC OFF switch. s the inspection result normal? YES >> GO TO 2 NO NO >> Check VDC OFF switch. Refer to BRC-197. "Diagnosis Procedure". 2. CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-148. "CONSULT-III Function ABS)". 2. CHECK COMBINATION METER S >> Check items displayed by self-diagnosis. 3. Check it the indication and operation of combination meter are normal	Component Function Check	INFOID:000000001342104
s the inspection result normal? YES >> GO TO 2 NO >> Go to diagnosis procedure. Refer to <u>BRC-201, "Diagnosis Procedure"</u> . 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 /CC OFF switch. s the inspection result normal? YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to <u>BRC-197, "Description"</u> . Diagnosis Procedure 1. CHECK VDC OFF SWITCH Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the /DC OFF switch. s the inspection result normal? YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to <u>BRC-197, "Diagnosis Procedure"</u> . 2. CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148, "CONSULT-III Function</u> ABS)". s 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 <u>MWI-4, "Work Flow"</u> . s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).	1.VDC OFF INDICATOR LAMP OPERATION CHEC	CK 1
YES >> GO TO 2 NO >> Go to diagnosis procedure. Refer to <u>BRC-201, "Diagnosis Procedure".</u> 2./DC OFF INDICATOR LAMP OPERATION CHECK 2 Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the //DC OFF switch. s the inspection result normal? YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to <u>BRC-197. "Description".</u> Diagnosis Procedure	Check that the lamp illuminates for approximately 1 s	econd after the ignition switch is turned ON.
NO >> Go to diagnosis procedure. Refer to <u>BRC-201. "Diagnosis Procedure"</u> . 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 <i>VDC OFF</i> switch. a the inspection result normal? YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to <u>BRC-197. "Description"</u> . Diagnosis Procedure 1 .CHECK VDC OFF SWITCH Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the <i>VDC OFF</i> switch. a the inspection result normal? YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to <u>BRC-197. "Diagnosis Procedure"</u> . 2 .CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148. "CONSULT-III Function</u> ABS)". a 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 <u>MWI-4, "Work Flow"</u> . a the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).	Is the inspection result normal?	
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. s the inspection result normal? YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to <u>BRC-197, "Description"</u> . Diagnosis Procedure 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. s the inspection result normal? YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to <u>BRC-197, "Diagnosis Procedure"</u> . 2. CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148, "CONSULT-III Function ABS"</u> . s the inspection result normal? YES >> GO TO 3 NO >> Check items displayed by self-diagnosis. 3. CHECK COMBINATION METER Check if the indicaton and operation of combination meter are normal. Refer to <u>MWI-4, "Work Flow"</u> . s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).		
2. YDC OFF INDICATOR LAMP OFERATION CHECK 2 Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the /DC OFF switch. s the inspection result normal? YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to BRC-197. "Description". Diagnosis Procedure <i>Methods Method</i> OCFF switch. S the inspection result normal? YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to BRC-197. "Diagnosis Procedure". 2. CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-148. "CONSULT-III Function ABS)". s the inspection result normal? YES >> GO TO 3 NO >> Check items displayed by self-diagnosis. Scheck COMBINATION METER Check if the indication and operation of combination meter are normal. Refer to MWI-4, "Work Flow". s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).		
//DC OFF switch. s the inspection result normal? YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to BRC-197. "Description". Diagnosis Procedure NPOD00000001302105 1.CHECK VDC OFF SWITCH Image: Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the //DC OFF switch. s the inspection result normal? YES YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to BRC-197. "Diagnosis Procedure". 2.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-148. "CONSULT-III Function ABS)". s the inspection result normal? YES 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-4, "Work Flow". s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).	VDC OFF INDICATOR LAMP OPERATION CHEC	CK 2
YES >> INSPECTION END NO >> Check VDC OFF switch. Refer to <u>BRC-197. "Description"</u> . Diagnosis Procedure 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. s the inspection result normal? YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to <u>BRC-197. "Diagnosis Procedure"</u> . 2.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148. "CONSULT-III Function</u> ABS)". s 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 <u>MWI-4. "Work Flow"</u> . s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).	Check that the VDC OFF indicator lamp in the combin VDC OFF switch.	nation meter turns ON/OFF correctly when operating the
NO >> Check VDC OFF switch. Refer to <u>BRC-197, "Description"</u> . Diagnosis Procedure	Is the inspection result normal?	
Diagnosis Procedure Instruction of combination meter turns ON/OFF correctly when operating the VDC OFF switch. Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch. St the inspection result normal? YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to BRC-197, "Diagnosis Procedure". 2. CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-148, "CONSULT-III Function ABS)". s the inspection result normal? YES >> GO TO 3 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-4, "Work Flow". s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).		
 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. <u>s the inspection result normal?</u> YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to <u>BRC-197. "Diagnosis Procedure"</u>. 2.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148. "CONSULT-III Function ABS</u>". <u>s the inspection result normal?</u> 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 <u>MWI-4. "Work Flow"</u>. <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). 	NO >> Check VDC OFF switch. Refer to <u>BRC-1</u>	97, "Description".
Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the /DC OFF switch. s the inspection result normal? YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to <u>BRC-197. "Diagnosis Procedure"</u> . 2.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148. "CONSULT-III Function</u> ABS)". s 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 <u>MWI-4, "Work Flow"</u> . s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).	Diagnosis Procedure	INFOID:000000001342105
VDC OFF switch. s the inspection result normal? YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to BRC-197, "Diagnosis Procedure". 2.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-148, "CONSULT-III Function ABS)". s 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-4, "Work Flow". s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).	1.CHECK VDC OFF SWITCH	
s the inspection result normal? YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to <u>BRC-197. "Diagnosis Procedure"</u> . 2.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148. "CONSULT-III Function</u> <u>ABS)"</u> . s 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 <u>MWI-4, "Work Flow"</u> . s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).		nation meter turns ON/OFF correctly when operating the
YES >> GO TO 2 NO >> Check VDC OFF switch. Refer to BRC-197. "Diagnosis Procedure". 2.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-148. "CONSULT-III Function ABS)". s 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-4, "Work Flow". s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).		
 NO >> Check VDC OFF switch. Refer to <u>BRC-197, "Diagnosis Procedure"</u>. 2.CHECK SELF-DIAGNOSIS Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148, "CONSULT-III Function ABS)"</u>. <u>s the inspection result normal?</u> 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 <u>MWI-4, "Work Flow"</u>. <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). 		
 Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148, "CONSULT-III Function</u> <u>ABS)"</u>. <u>s the inspection result normal?</u> YES >> GO TO 3 NO >> Check items displayed by self-diagnosis. CHECK COMBINATION METER Check if the indication and operation of combination meter are normal. Refer to <u>MWI-4, "Work Flow"</u>. <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit). 	NO >> Check VDC OFF switch. Refer to BRC-19	97, "Diagnosis Procedure".
Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148</u> , " <u>CONSULT-III Function</u> <u>ABS</u>)". <u>s the inspection result normal?</u> 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 <u>MWI-4</u> , " <u>Work Flow</u> ". <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit).	2.CHECK SELF-DIAGNOSIS	
s 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-4, "Work Flow". s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).	Perform ABS actuator and electric unit (control unit) s	elf-diagnosis. Refer to BRC-148, "CONSULT-III Function
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-4, "Work Flow". s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).		
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-4, "Work Flow". s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).		
3. CHECK COMBINATION METER Check if the indication and operation of combination meter are normal. Refer to <u>MWI-4, "Work Flow"</u> . <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit).		
Check if the indication and operation of combination meter are normal. Refer to <u>MWI-4, "Work Flow"</u> . <u>s the inspection result normal?</u> YES >> Replace ABS actuator and electric unit (control unit).	-	
s the inspection result normal? YES >> Replace ABS actuator and electric unit (control unit).		meter are normal. Refer to MWL4. "Work Flow"
YES >> Replace ABS actuator and electric unit (control unit).	•	
	•	control unit)
		Somo unit.

[VDC/TCS/ABS]

А

SLIP INDICATOR LAMP

< COMPONENT DIAGNOSIS >

SLIP INDICATOR LAMP

Description

INFOID:000000001342106

INFOID:000000001342107

INFOID:000000001342108

[VDC/TCS/ABS]

×:	ON	-:	O	FF
· · ·	~		<u> </u>	

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

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 <u>BRC-202, "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-148, "CONSULT-III Function</u> (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 <u>MWI-4, "Work Flow"</u>. <u>Is the inspection result normal?</u>

- YES >> Replace ABS actuator and electric unit (control unit).
- NO >> Repair or replace combination meter.

< ECU DIAGNOSIS >

ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000001342109

А

С

[VDC/TCS/ABS]

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.

		Data monitor				
Monitor item	Display content	Condition	Reference value in normal operation			
FR LH SENSOR		0 [km/h]	Vehicle stopped			
FR RH SENSOR RR LH SENSOR RR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)			
	Droke podel energian	When brake pedal is de- pressed	ON			
STOP LAMP SW	Brake pedal operation	When brake pedal is not depressed	OFF			
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V			
SLCT LVR POSI	A/T shift position	P position R position N position D position	P R N D			
	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indica- tor lamp is ON)	ON			
OFF SW	VDC OFF Switch ON/OFF	VDC OFF switch OFF (When VDC OFF indica- tor lamp is OFF)	OFF			
	You gets detected human sets (side C sensor	When vehicle stop	Approx. 0 d/s			
YAW RATE SEN	Yaw rate detected by yaw rate/side G sensor	When vehicle turning	-75 to 75 d/s			
ACCEL POS SIG	Throttle actuator opening/closing is displayed (linked with	Accelerator pedal not de- pressed (ignition switch is ON)	0 %			
	accelerator pedal)	Depress accelerator ped- al (ignition switch is ON)	0 - 100 %			
		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)			
		Straight-ahead	Approx. 0°			
STR ANGLE SIG	Steering angle detected by steering angle sensor	Steering wheel turned	-720 to 720°			
		With ignition switch turned ON and brake pedal released	Approx. 0 bar			
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	With ignition switch turned ON and brake pedal depressed	–40 to 300 bar			

< ECU DIAGNOSIS >

/	
[VDC/TCS/ABS	51
	'

		Data mo	onitor
Monitor item	Display content	Condition	Reference value in normal operation
		With engine stopped	0 rpm
ENGINE RPM	With engine running	Engine running	Almost in accor- dance with tachome- ter display
FLUID LEV SW	Brake fluid level switch	When brake fluid level switch ON	ON
		When brake fluid level switch OFF	OFF
PARK BRAKE SW	Darking brake owitab	Parking brake switch is active	ON
PARK BRAKE SW	Parking brake switch	Parking brake switch is inactive	OFF
FR LH IN SOL FR LH OUT SOL FR RH IN SOL FR RH OUT SOL RR LH IN SOL	Operation status of all solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or ac- tuator relay is inactive (in fail-safe mode)	ON
RR LH OUT SOL RR RH IN SOL RR RH OUT SOL		When the actuator (sole- noid valve) is not active and actuator relay is ac- tive (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 operat- ing	OFF
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	ON
(Note 2)		When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	ON
	(Note 3)	When ABS warning lamp is OFF	OFF
OFF LAMP	VDC OFF indicator lamp	When VDC OFF indica- tor lamp is ON	ON
OFF LAMP	(Note 3)	When VDC OFF indica- tor lamp is OFF	OFF
	SLIP indicator lamp	When SLIP indicator lamp is ON	ON
SLIP LAMP	(Note 3)	When SLIP indicator lamp is OFF	OFF
		When snow mode switch is ON	ON
SNOW MODE SW	Snow mode switch	When snow mode switch is OFF	OFF
BST OPER SIG	Not applied but displayed	_	OFF
M-MODE SIG	Manual mode activated	When the manual mode is active	ON
		When the manual mode is inactive	OFF

< ECU DIAGNOSIS >

 -/
[VDC/TCS/ABS]

		Data monitor				
Monitor item	Display content	Condition	Reference value in normal operation			
EBD SIGNAL		EBD is active	ON			
EBD SIGNAL	EBD operation	EBD is inactive	OFF			
		ABS is active	ON			
ABS SIGNAL	ABS operation	ABS is inactive	OFF			
TCS SIGNAL	TCC exercise	TCS is active	ON			
ICS SIGNAL	TCS operation	TCS is inactive	OFF			
	VPC aparetian	VDC is active	ON			
VDC SIGNAL	VDC operation	VDC is inactive	OFF			
EBD FAIL SIG	EPD foil oofo oignol	In EBD fail-safe	ON			
EDD FAIL SIG	EBD fail-safe signal	EBD is normal	OFF			
	APS fail cofe signal	In ABS fail-safe	ON			
ABS FAIL SIG	ABS fail-safe signal	ABS is normal	OFF			
		In TCS fail-safe	ON			
TCS FAIL SIG	TCS fail-safe signal	TCS is normal	OFF			
		In VDC fail-safe	ON			
VDC FAIL SIG	VDC fail-safe signal	VDC is normal	OFF			
	Oracli an antian	Crank is active	ON			
CRANKING SIG	Crank operation	Crank is inactive	OFF			
USV HSV (FL-RR, FR-RL)	VDC switch-over valve	When actuator (switch- over valve) is active ("AC- TIVE TEST" with CON- SULT-III) or actuator relay is inactive (when in fail-safe mode)	ON			
(Note 2)		When actuator (switch- over valve) is not active and actuator relay is ac- tive (ignition switch ON)	OFF			
V/R OUTPUT	Solonoid valve relay activated	When the solenoid valve relay is active (When igni- tion switch OFF)	ON			
(Note 2)	Solenoid valve relay activated	When the solenoid valve relay is not active (in the fail-safe mode)	OFF			
M/R OUTPUT	Actuator motor and motor relay activated	When the actuator motor and motor relay are ac- tive ("ACTIVE TEST" with CONSULT-III)	ON			
		When the actuator motor and motor relay are inac- tive	OFF			

Note 1: Confirm tire pressure is normal.

Note 2: A brief moment of ON/OFF condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

Note 3: On and off timing for warning lamp and indicator lamp. Refer to BRC-144, "System Description".

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [VDC/TCS/ABS]

< ECU DIAGNOSIS >

Wiring Diagram - Coupe

INFOID:000000001342110



ALFWA0003GE



< ECU DIAGNOSIS >

[VDC/TCS/ABS]

BRAKE OIL IN

>

27

PKB

G/R



AWFIA0091GB

< ECU DIAGNOSIS >

[VDC/TCS/ABS]



< ECU DIAGNOSIS >

[VDC/TCS/ABS]



ALFIA0040GB

	TO WIRE			3 2 1	0				Signal Name	I	1	I	I				
Connector No. E29		Connector Color WHITE			HS.			9	Terminal No. Wire	4 R/W		13 L/Y	14 W/R	_			
Signal Name	DS FI	DPBI				DS FR	DIAG-K	CAN-M2	CAN-L	DP FL	DS RL	NZ	DS RR	BLS	ASR AUS	CAN-P2	CAN-H
Color of Wire		. ~	. 0/W		E E			Y/B	Ь	U	R/W	GR/R	B/R		SB /	~	L L
Terminal No.	ر. ا	ى د	o c	α	57	10	11	14	15	16	17	18	19	20	21	25	26
	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL		×				[[18 10 21 21	7 8 9 10 11 12 13 14 15			Signal Name	MGND	UB (MR)	UB (VR)	GND	
	Connector Name ABS A	(TINU	Connector Color BLACK				0 L		Ľ	- 11	Color of	l erminal No. Wire		2 G/R	3 R/B	4 B	
ני	<u>ပ</u>		0		ľ	r ·		C	=	IJ							J

< ECU DIAGNOSIS >

[VDC/TCS/ABS]

BRC-211

Ρ

< ECU DIAGNOSIS >



Connector No.	E44	Connector No. E46	E46	Connector No. E47	E47
Connector Name	Connector Name JUNCTION BLOCK	Connector Nai	Connector Name JUNCTION BLOCK	Connector Na	Connector Name JUNCTION BLOCK
Connector Color BROV	BROWN	Connector Color WHITE	or WHITE	Connector Color WHITE	or WHITE
H.S.	4	B.H.S.H	31 30 29 28 27 26 25 40 39 38 37 36 35 34 33 32	品 H.S.	42 1 46 45 44
Terminal No. Wire	or of Signal Name	Terminal No. Wire	Color of Signal Name	Terminal No. Wire	color of Signal Name Wire

T

GR

4

I. Т

0 BA

31 26 33 31

I

0

Т

SB

10

ALFIA0042GB

ī

4

DIAGNOSIS >		[VDC/TCS/ABS]
B43 REAR WHEEL SENSOR GRAY a 4 signal Name	SIG_LH SIG_RH SIG_RH	
	B/R R/R	
Connector No. Connector Name Gonnector Color H.S. Terminal No. Colo		
Connector No. Connector Nam Connector Colo H.S.	- α α 4	
B10 WIRE TO WIRE WHITE 3		
	MA ANN ANN ANN ANN ANN ANN ANN ANN ANN A	
inector No inector No inector Co minal No.	τ ω ^τ ^τ ^τ ^τ	
Connector No. E49 Connector Name JUNCTION BLOCK Connector Color BROWN 네요 [443]환 51		
Leta JUNCTION BROWN S4 53 25 51 Fo Fo Sig		
Connector No. E49 Connector Name JUNCTIC Connector Color BROWN E49 54 53 22 E 54 53 22 E 54 53 22 E	CBR/R	
Connector No. Connector Nam Connector Colc H.S. H.S.	3 2	

ALFIA0043GB

Ρ

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [VDC/TCS/ABS]

< ECU DIAGNOSIS >

Wiring Diagram - Sedan

INFOID:000000003188076



AWFWA0035GI

< ECU DIAGNOSIS >





Ρ

< ECU DIAGNOSIS >

[VDC/TCS/ABS]



AWFIA0145GB

BRAKE OIL IN

>
AB CU DIAGNOSIS		UATOF	r Al	ND ELECT	RIC	: U	IN	IT (CON	ſRC)L	U	N	IT) [VDC/TCS/ABS]
CONNECTOR-M01		Signal Name	1 1			BLOCK (J/B)		7P 6P 5P 4P 3P 2P 1P 16P15P14P13P12P11P10P 9P 8P	Signal Name	1	1	1	
5. M64 ame JOINT blor GRAY	0 0 4	Color of Wire	<u></u> ш		0. E6	FUSE	olor WHITE	7P 6P 5P 4P 16P 15P 14P 13P 1	Color of Wire	SB	R/G	Y/R	
Connector No. Connector Name Connector Color	园 H.S.	Terminal No.	∾ ത		Connector No	Connector Name	Connector Color	品 H.S.	Terminal No.	1P	2P	8Р	



< EC

Signal Name	I	I	I	
Color of Wire	В	В	В	
Terminal No.	4	5	8	

	YAW RATE/SIDE/DECEL G SENSOR	X		Signal Name	GND	CAN-L	CAN-H	IG
. M55		lor BLACK		Color of Wire	в	Y/B	≻	GR
Connector No.	Connector Name	Connector Color	雨 H.S.	Terminal No.	-	2	e	4

					c L
Connector No. M72	M72	Connector No. M73	M73	Connector No.	р Ц
Connector Name	Connector Name VDC OFF SWITCH	Connector Name	Connector Name PARKING BRAKE SWITCH	Connector Name FUSE	FUSE
Connector Color GRAY	GRAY		(WITH M/T)	Connector Color WHIT	TIHW
		Connector Color BLACK	BLACK		
俋				42	7P 6P 5P 4F
9	5 4 3 2 1			 	16P 15P 14P 13
		H.S.			
Terminal No. Wire	lor of Vire Signal Name	Terminal No. Wire	vlor of Signal Name	Terminal No. Wire	lor of Vire
		-			

Signal Name	-	I	
Color of Wire	SB	В	
Terminal No. Wire	ļ	2	

I

G/R

-



Ρ

А

В

С

D

Ε

BRC

G

Н

J

Κ

L

M

Ν

0

< ECU DIAGNOSIS >

[VDC/TCS/ABS]



ALFIA0040GB

AGN	05	15	>																										L			5/AI
E29	IRE TO WIRE	WHILE		7 6 5 4 3 2 1 16 15 14 13 12 11 10 9 8				ot Signal Name	1	1	1	1					E35	PARKING BRAKE SWITCH	VIIH CVI)	BLACK		-	-			Signal Name	1					
Connector No.	_	Connector Color W			H.S.			Terminal No. Wire	4 R/W	5 B/R							Connector No.	Connector Name P	-	Connector Color BI	4		H.S.		Color	Terminal No. Wire	1 G/R					
Signal Name	DS FL	DP RL	DP RR	DP FR	DS FR	DIAG-K	CAN-M2	CAN-L	DP FL	DS RL	ΠZ	DS RR	BLS	ASR AUS	CAN-P2	CAN-H		signal Name	I	1	1	I	I	-	I	I		1	1			
Color of Wire	E E	۲۸	W/R	в	8	0	Y/B	۵.	ŋ	R/W	GR/R	B/R	P/B	SB	~		Color of	Wire	۹.	_	G/R	>	0	L	٩.	GR	>	SB	Y/B	-		
Terminal No.	5	9	8	6	10	=	14	15	16	17	18	19	20	21	25	26		ġ.	98	15G	24G	31G	34G	51G	52G	67G	70G	75G	77G	-		
	· 				1	1		4 5							1	1		1		1					•	•		•	•	_		
	ELECTRIC UNIT (CONTROL					[ZU ZI ZZ Z3 Z4			Signal Name	MGND	UB (MR)	UB (VR)	GND			NIRE				G 8G 9G		16 326 336 346	iG 40G 41G	rG 48G 49G 50G	26 576 580		06 746 726 16 786 796 806	988		
			r BLACK				; ;	5 6 7 8 9		Color of		В	G/R	R/B	В		E30	e WIRE TO WIRE	r WHITE			3G 4G 5G 6G 7G 8G 9G 1G 2G 100 110 100 100 100 100 100		18G 19G 27G 28G 29G 30G 31G 20G 33G	356 366 376 396 39	426 436 446 456 466 476 486 496	55G 56G 57G 58G		64G 65G 67G 68G 69G 70G 71G 72G 54G 65G 73G 74G 75G 76G 77G 78G 79G 80G	816 826		
Connector No.	Connector Name		Connector Color			H.S.		2 3 4			Terminal No.	٢	2		4		Connector No.	Connector Name	Connector Color												//	

< ECU DIAGNOSIS >





T

P/B

AWFIA0146GB



ALFIA0043GB

INFOID:000000001342111

ABS, EBD SYSTEM

Fail-Safe

In case of electrical malfunctions with the ABS, ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp will turn on. In case of electrical malfunctions with the EBD, brake warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the fail-safe function.

BRC-221

< ECU DIAGNOSIS >

• For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without TCS/ABS system.

NOTE:

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition switch ON" and "The first starting" are being performed.

• For malfunction of EBD, EBD and ABS become inoperative, and the condition of vehicle is the same as the condition of vehicles without TCS/ABS, EBD system.

VDC / TCS

In case of malfunction in the VDC/TCS/ABS system, VDC OFF indicator lamp, SLIP indicator lamp are turned on, and the condition of vehicle is the same as the condition of vehicles without VDC/TCS control. **CAUTION:**

If the Fail-Safe function is activated, then perform self-diagnosis for VDC/TCS/ABS control system.

DTC No. Index

Display item	Malfunction detecting condition	Check item		
RR RH SENSOR-1 [C1101]	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is out- side the standard.			
RR LH SENSOR-1 [C1102]	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	BRC-155, "Diagno- sis Procedure"		
FR RH SENSOR-1 [C1103]	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	(Note 1)		
FR LH SENSOR-1 [C1104]	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.			
RR RH SENSOR-2 [C1105]	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.			
RR LH SENSOR-2 [C1106]	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.	BRC-158. "Diagno- sis Procedure"		
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the dis- tance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	(Note 1)		
FR LH SENSOR- 2 [C1108]	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.			
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-161, "Diagno- sis Procedure"		
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-163, "Diagno- sis Procedure"		
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.	BRC-164, "Diagno-		
[C1111]	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	sis Procedure"		
MAIN RELAY	During the actuator relay operating with OFF, when the actuator relay turns ON. Or when the control line for the relay is shorted to the ground.	BRC-166, "Diagno-		
[C1114]	During the actuator relay operating with ON, when the actuator relay turns OFF, or when the control line for the relay is open.	sis Procedure"		
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input signal is malfunctioning.	BRC-168, "Diagno- sis Procedure" (Note 1)		
STOP LAMP SW [C1116]	When stop lamp switch circuit is open.	BRC-171, "Diagno- sis Procedure"		

< ECU DIAGNOSIS >

[VDC/TCS/ABS]

Display item	Malfunction detecting condition	Check item
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-173, "Diagno-
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	sis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-175, "Diagno-
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	sis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	
ENGINE SIGNAL 1 [C1130]		
ENGINE SIGNAL 2 [C1131]		
ENGINE SIGNAL 3 [C1132]	Major engine components are malfunctioning.	BRC-177, "Diagno- sis Procedure"
ENGINE SIGNAL 4 [C1133]		
ENGINE SIGNAL 6 [C1136]		
PRESS SEN CIRCUIT [C1142]	Pressure sensor signal line is open or shorted, or pressure sensor is malfunctioning.	BRC-179, "Diagno- sis Procedure"
ST ANG SEN CIRCUIT [C1143]	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	BRC-181, "Diagno-
ST ANG SEN SIGNAL [C1144]	Neutral position correction of steering angle sensor is not finished.	sis Procedure"
YAW RATE SENSOR [C1145]	Yaw rate sensor is malfunctioning, or the yaw rate sensor signal line is open or shorted.	BRC-183, "Diagno-
SIDE G-SEN CIRCUIT [C1146]	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	sis Procedure"
USV LINE [FL-RR] [C1147]	VDC switch-over solenoid valve (USV1) on the primary side is open circuit or short- ed, or the control line is open or shorted to the power supply or the ground.	
USV LINE [FR-RL] [C1148]	VDC switch-over solenoid valve (USV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	BRC-186, "Diagno-
HSV LINE [FL-RR] [C1149]	VDC switch-over solenoid valve (HSV1) on the primary side is open circuit or short- ed, or the control line is open or shorted to the power supply or the ground.	sis Procedure"
HSV LINE [FR-RL] [C1150]	VDC switch-over solenoid valve (HSV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	
EMERGENCY BRAKE [C1153]	When ABS actuator and electric unit (control unit) is malfunctioning. (Pressure in- crease is too much or too little)	BRC-163, "Diagno- sis Procedure"
PNP POS SIG [C1154]	TCM or ABS actuator and electric unit (control unit) internal malfunction.	BRC-189, "Diagno- sis Procedure"
BR FLUID LEVEL LOW [C1155]	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.	BRC-190, "Diagno- sis Procedure"
ST ANG SEN COM CIR [C1156]	CAN communication circuit or steering angle sensor is malfunctioning.	BRC-193, "Diagno- sis Procedure"

< ECU DIAGNOSIS >

[VDC/TCS/ABS]

Display item	Malfunction detecting condition	Check item
VARIANT CODING [C1170]	In a case where VARIANT CODING is different.	BRC-163, "Diagno- sis Procedure"
CAN COMM CIRCUIT [U1000]	When there is a malfunction in the CAN communication circuit.	BRC-194, "Diagno- sis Procedure" (Note 2)

Note 1: After completing repairs of shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Make sure that ABS warning lamp turns off while driving vehicle at 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for wheels, check wheel sensor circuit and also check control unit power voltage. Note 2: When malfunctions are detected in several systems, including CAN communication circuit [U1000], troubleshoot CAN communication circuit. Refer to <u>BRC-194</u>, "<u>Diagnosis Procedure</u>".

SYMPTOM DIAGNOSIS VDC/TCS/ABS

Symptom Table

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

Symptom	Check item	Reference				
	Brake force distribution					
Excessive ABS function operation fre-	Looseness of front and rear axle	BRC-226, "Diag- nosis Procedure"				
10000	Wheel sensor and rotor system	<u>1100101110000010</u>				
Incorported podel reaction	Brake pedal stroke					
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.	<u>BRC-228, "Diag-</u> nosis Procedure"				
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-229, "Diag- nosis Procedure"				
Pedal vibration or ABS operation sound	Brake pedal	BRC-230, "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-	ТСМ	BRC-231, "Diag- nosis Procedure"				
	ECM	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 (just place a foot on it). However, this is normal.

- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [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]

L

Μ

Κ

J

0

Ρ

[VDC/TCS/ABS]

INFOID:000000001342113

А

В

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:000000001342114

[VDC/TCS/ABS]

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. "Inspection"</u>, Rear: <u>RAX-5. "On-vehicle Service"</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.
 - Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

- YES >> Normal
- NO >> Perform self-diagnosis. Refer to <u>BRC-148, "CONSULT-III Function (ABS)"</u>.

UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS >

UNEXPECTED PEDAL REACTION	Δ
Diagnosis Procedure	A
1.CHECK BRAKE PEDAL STROKE	В
Check brake pedal stroke. Refer to BR-12, "Inspection and Adjustment".	
Is the stroke too big?	0
 YES >> • Bleed air from brake tube and hose. Refer to <u>BR-15. "Bleeding Brake System"</u>. • Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: <u>BR-12. "Inspection and Adjustment"</u>, brake booster and 	U
master cylinder. NO >> GO TO 2	D
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.	E
Is the inspection result normal?	BRC
YES >> GO TO procedure 3 "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom 1. Refer to BRC-226, "Diagnosis Procedure".	DKC
NO >> Check brake system.	G

Н

J

Κ

L

Μ

Ν

Ο

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:000000001342116

[VDC/TCS/ABS]

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 >> GO TO procedure "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom. Refer to <u>BRC-226, "Diagnosis Procedure"</u>.
- NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

< SYMPT	OM DIAGNOS	ilS >
---------	------------	-------

INFOID:000000001342117

ABS FUNCTION DOES NOT OPERATE

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 >> GO TO procedure "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom. Refer to BRC-226, "Diagnosis Procedure".
- NO >> Perform self-diagnosis. Refer to <u>BRC-148, "CONSULT-III Function (ABS)"</u>.

А

В

С

BRC

Н

J

Κ

L

Μ

Ν

Ο

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:000000001342118

[VDC/TCS/ABS]

CAUTION:

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

- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [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 if there is pedal vibration or operation sound when the engine is started.

Do symptoms occur?

YES >> GO TO 2

NO >> Perform self -diagnosis. Refer to <u>BRC-148, "CONSULT-III Function (ABS)"</u>.

2.SYMPTOM CHECK 2

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 >> GO TO procedure "CHECK WHEEL SENSOR AND SENSOR ROTOR" of symptom. Refer to <u>BRC-226, "Diagnosis Procedure"</u>.

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL < SYMPTOM DIAGNOSIS > [VDC/TCS/ABS]
VEHICLE JERKS DURING VDC/TCS/ABS CONTROL
Diagnosis Procedure
1.SYMPTOM CHECK
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 Perform self-diagnostic of ABS actuator and electric unit (control unit). Are self-diagnosis results indicated?
 YES >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis. NO >> GO TO 3 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. <u>Are self-diagnosis results indicated?</u> YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. NO >> GO TO 4 <u>Arective Connector ABS actuator and electric unit (control unit) self-diagnosis. <u>Are self-diagnosis results indicated?</u> <u>YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. <u>AC ABS ACTUAL AC</u></u></u>
Perform ECM and CVT self-diagnosis. Are self-diagnosis results indicated? YES >> Check the corresponding items. • ECM: Refer to EC-1012. • CVT: Refer to TM-85. NO >> Replace ABS actuator and electric unit (control unit).

BRC-231

Ο

< PRECAUTION > PRECAUTION PRECAUTIONS

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

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

- Recommended fluid is brake fluid "DOT 3".
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted surface of body. If brake fluid is splashed on painted surfaces of body immediately wipe off then with cloth and then wash it away with water.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect connectors of ABS actuator and electric unit (control unit) or the battery cable from the negative terminal.

WARNING:

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

Precaution for Brake Control



INFOID:000000001342122

INFOID:000000001342121

- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or SLIP indicator lamp may light.

BRC-232

PRECAUTIONS

[VDC/TCS/ABS]

- When replacing the following parts with parts other than genuine parts or making modifications: Suspensionrelated parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).
- When driving with worn or deteriorated suspension, tires and brake-related parts.

Ε

А

В

С

D

BRC

Н

J

Κ

L

Μ

Ν

Ο

Ρ

G

BRC-233

< PRECAUTION >

PREPARATION

< PREPARATION > PREPARATION PREPARATION

Special Service Tool

INFOID:000000001342123

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
 (J-45741) ABS active wheel sensor tester	J-15741-BOX	Checking operation of ABS active wheel sensor

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	

WHEEL SENSORS

[VDC/TCS/ABS]

< ON-VEHICLE REPAIR > ON-VEHICLE REPAIR WHEEL SENSORS

Removal and Installation

INFOID:000000001342126



CAUTION:

- Be careful not to damage wheel sensor edge and sensor rotor teeth.
- When removing the front or rear wheel hub assembly, first remove the wheel sensor from the assembly. Failure to do so may result in damage to the wheel sensor wires making the sensor inoperative.
 CAUTION:
- Pull out the wheel sensor, being careful to turn it as little as possible. Do not pull on the wheel sensor harness.
- Installation should be performed while paying attention to the following, and then tighten bolts and nuts to the specified torque.
- Check if foreign objects such as iron fragments are adhered to the pick-up part of the sensor or to the inside of the hole for the wheel sensor, or if a foreign object is caught in the surface of the mating surface for the rotor. If something wrong is found, fix it and then install the wheel sensor.

REMOVAL

Fro	nt	M
1.	Remove wheel and tire using power tool.	
2.	Partially front wheel fender protector. Refer to EXT-19. "Removal and Installation".	
3.	Remove wheel sensor bolt and wheel sensor.	Ν
4.	Remove harness wire from mounts and disconnect wheel sensor harness connector.	
Rea NO	ar DTE:	0
Bot	th rear wheel sensors share one harness and must be replaced as an assembly.	
1.	Remove wheel and tire using power tool.	
2.	Remove wheel sensor bolts and wheel sensors from both rear wheels.	Ρ
3.	Remove harness wire from mounts and harness wire clips from suspension member.	

BRC-235

А

J

Κ

L

WHEEL SENSORS

< ON-VEHICLE REPAIR >

[VDC/TCS/ABS]

4. Disconnect wheel sensor harness connector (1).



INSTALLATION

Installation is in the reverse order of removal.

• When installing wheel and tire, refer to WT-37, "Adjustment".

< ON-VEHICLE REPAIR >

SENSOR ROTOR

Removal and Installation

The front and rear wheel sensor rotors are an integral part of the wheel hub assemblies and can not be disassembled. When replacing the sensor rotor, replace the wheel hub assembly. Refer to <u>FAX-7</u>, "<u>Removal and</u> <u>Installation</u>" (Front), <u>RAX-6</u>, "<u>Removal and Installation</u>" (Rear).

А

В

С

D

Е

BRC

G

Н

J

Κ

L

Μ

Ν

Ο

Ρ

< ON-VEHICLE REPAIR >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

COMPONENT

INFOID:000000001342128

[VDC/TCS/ABS]



- 1. From master cylinder secondary side 2. 4.
- Grommet
 - From master cylinder primary side 5. To front LH brake caliper To front RH brake caliper 8.
 - To rear LH brake caliper
- ⇐ Front

7.

Refer to GI section GI-4, "Components" for symbol marks in the figure.

Removal and Installation

REMOVAL

CAUTION:

- Be careful of the following.
- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut torque wrench.

3.

6.

9.

To rear RH brake caliper

ABS actuator and electric unit

- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Do not remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to **BR-15**, "Bleeding Brake System".

BRC-238

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [VDC/TCS/ABS] < ON-VEHICLE REPAIR > 1. Remove front wiper arms. Refer to WW-40, "FRONT WIPER ARMS : Removal and Installation". А 2. Remove cowl top. Refer to EXT-18, "Removal and Installation". Disconnect washer hose. 4. Remove tower bar, if equipped. Refer to FSU-11, "Exploded View". В 5. Disconnect ABS actuator and electric unit (control unit) connector. 6. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit). 7. Remove ABS actuator and electric unit (control unit) nuts. 8. Remove ABS actuator and electric unit (control unit) from vehicle. 9. Remove bracket as necessary. D INSTALLATION CAUTION: Be careful of the following. • Before servicing, disconnect the battery cable from negative terminal. Е • To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut torque wrench. Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it. BRC Do not remove and install actuator by holding harness. After work is completed, bleed air from brake tube. Refer to BR-15, "Bleeding Brake System". After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked. Installation is in the reverse order of removal.

Н

Κ

L

Μ

Ν

G SENSOR

Removal and Installation

REMOVAL

CAUTION:

• Do not drop or strike yaw rate/side G sensor, because it has little endurance to impact.

• Do not use power tool etc., because yaw rate/side G sensor is sensitive for the impact.

1. Remove center console. Refer to IP-16, "Exploded View".

- 2. Disconnect yaw rate/side G sensor harness connector.
- 3. Remove nuts. Remove yaw rate/side G sensor.

INSTALLATION

CAUTION:

• Do not drop or strike yaw rate/side G sensor, because it has little endurance to impact.

• Do not use power tool etc., because yaw rate/side G sensor is sensitive for the impact.

Installation is in the reverse order of removal.



STEERING ANGLE SENSOR

Removal and Installation

REMOVAL

- 1. Remove the spiral cable. Refer to <u>SR-6, "Removal and Installation"</u>.
- Remove the screws (A) and release clips (B) to remove the steering angle sensor (1) from spiral cable (2).

CAUTION:

In the case that the ABS actuator and electronic unit (control unit) is replaced, make sure to adjust position of steering angle sensor. Refer to <u>BRC-142, "ADJUSTMENT OF STEERING ANGLE SENSOR</u> ^G <u>NEUTRAL POSITION : Special Repair Requirement"</u>.

INSTALLATION

1. Installation is in the reverse order of removal.



INFOID:000000001737228

А

В

Н

J

Κ

L

Μ

Ν

0