SECTION BRC
BRAKE CONTROL SYSTEM

CONTENTS

ABS

TCS/ABS

VDC/TCS/ABS

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

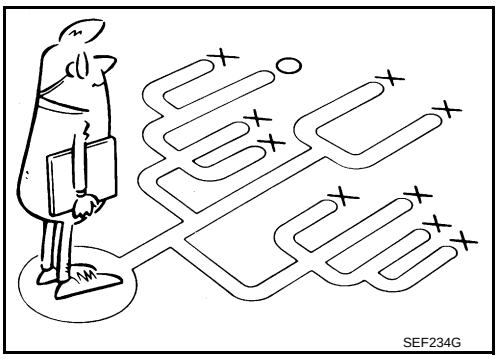
Work Flow

INFOID:0000000000992457

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”.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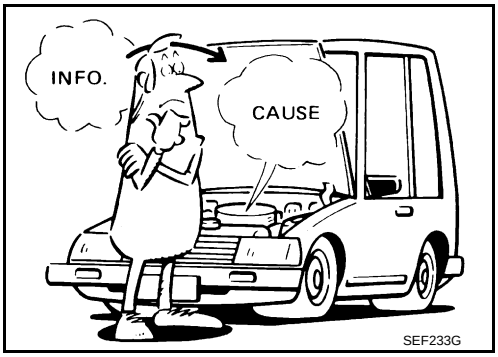
- It is essential to check symptoms right from the beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions 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 BRC-12, "CONSULT-III Function (ABS)".
- Always read “GI General Information” to confirm general precautions. Refer to BRC-12, "CONSULT-III Function (ABS)".



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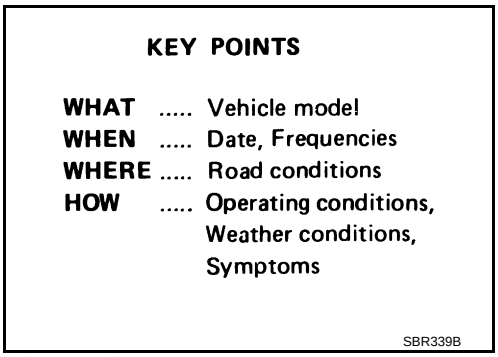
Asking Complaints

- 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.



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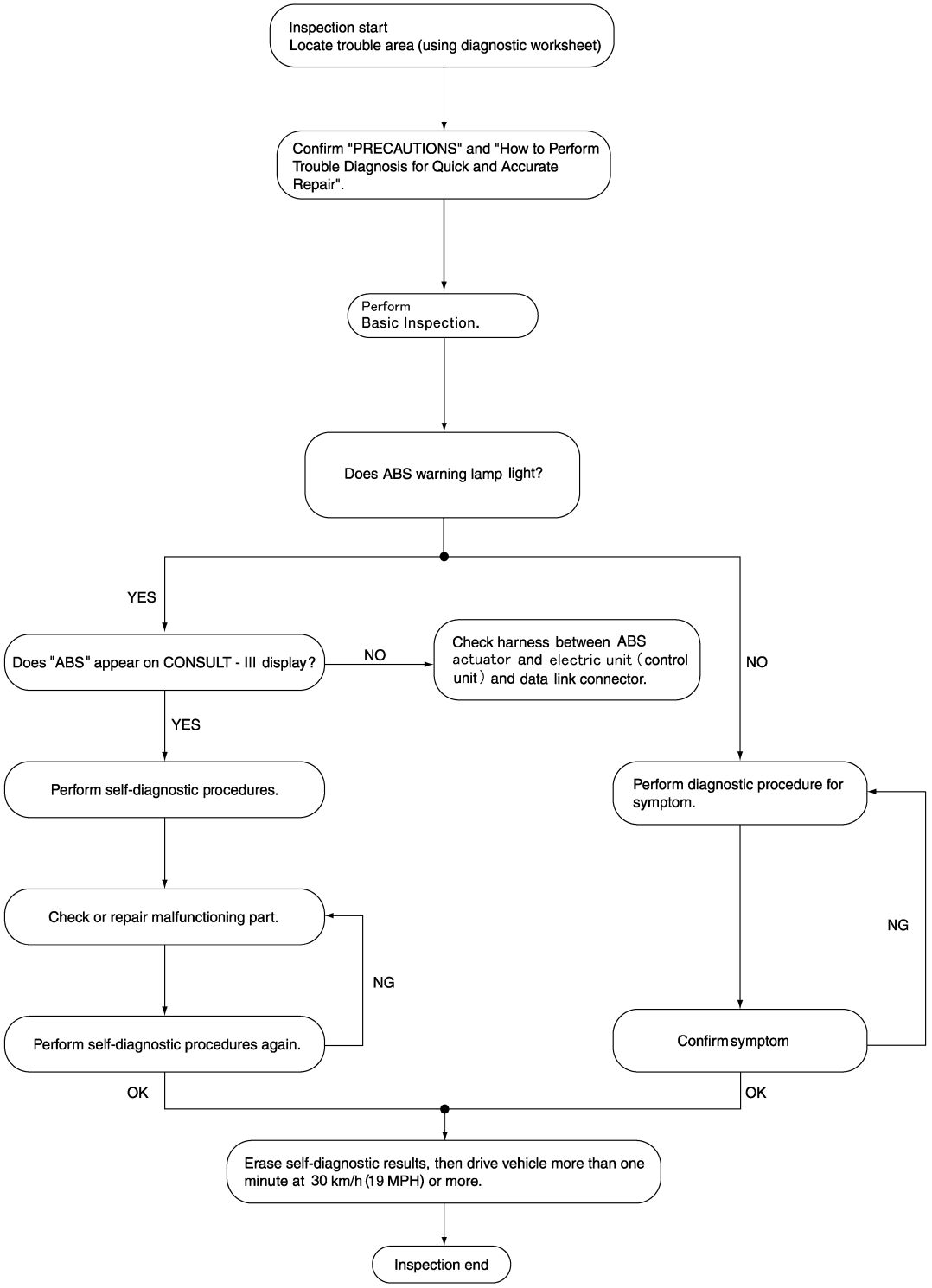
OVERALL SEQUENCE



WFIA0558E

Diagnostic Work Sheet

INFOID:0000000000992458

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ 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		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

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FUNCTION DIAGNOSIS

ABS

System Diagram

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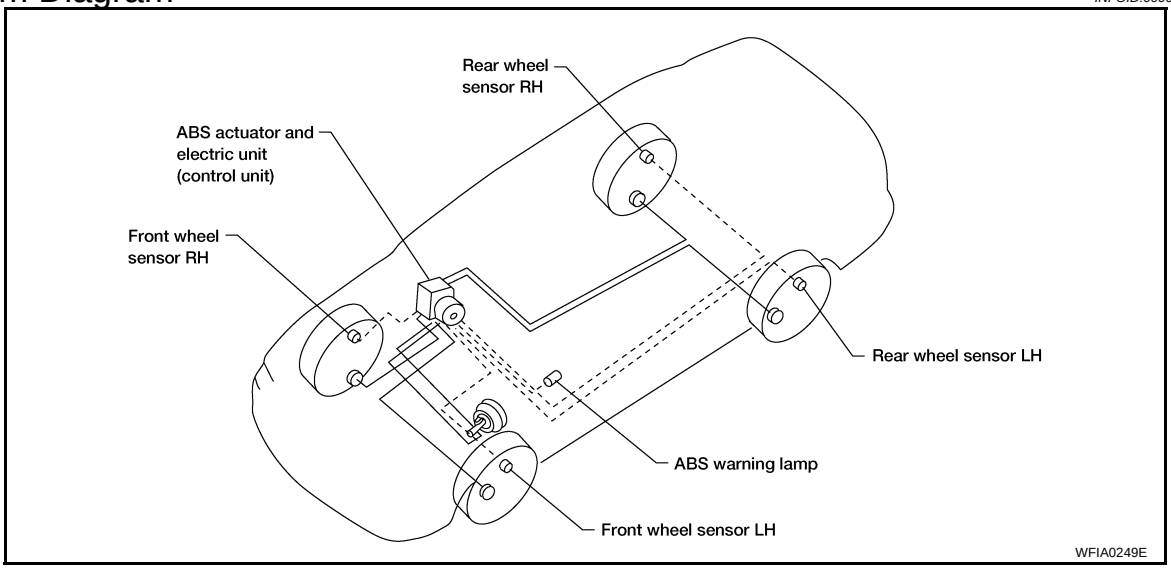


System Description

INFOID:0000000000992460

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 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.

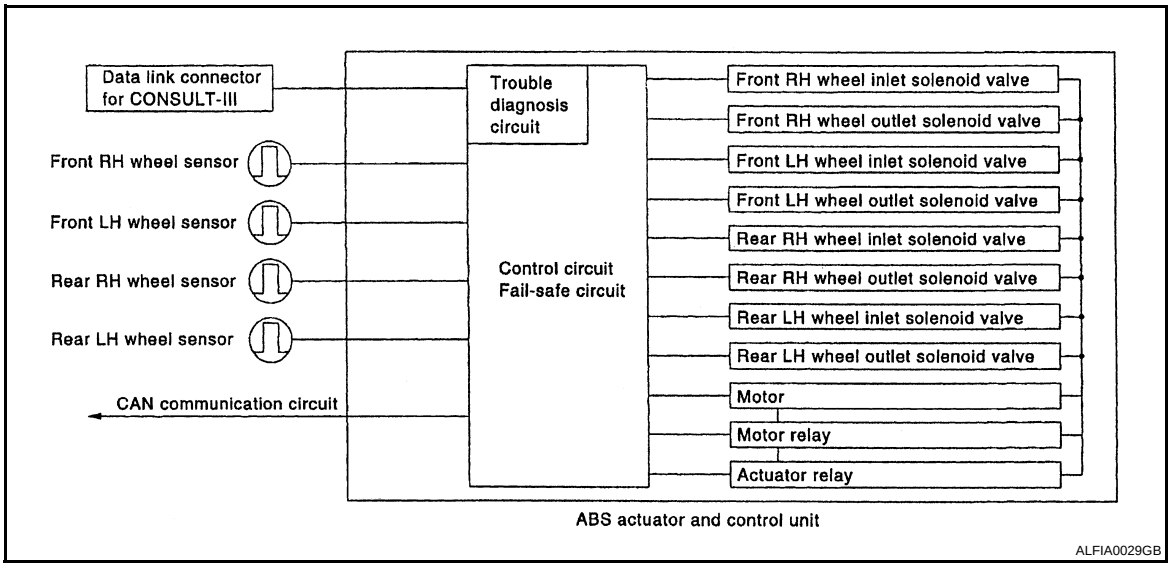
OPERATION

- 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 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.

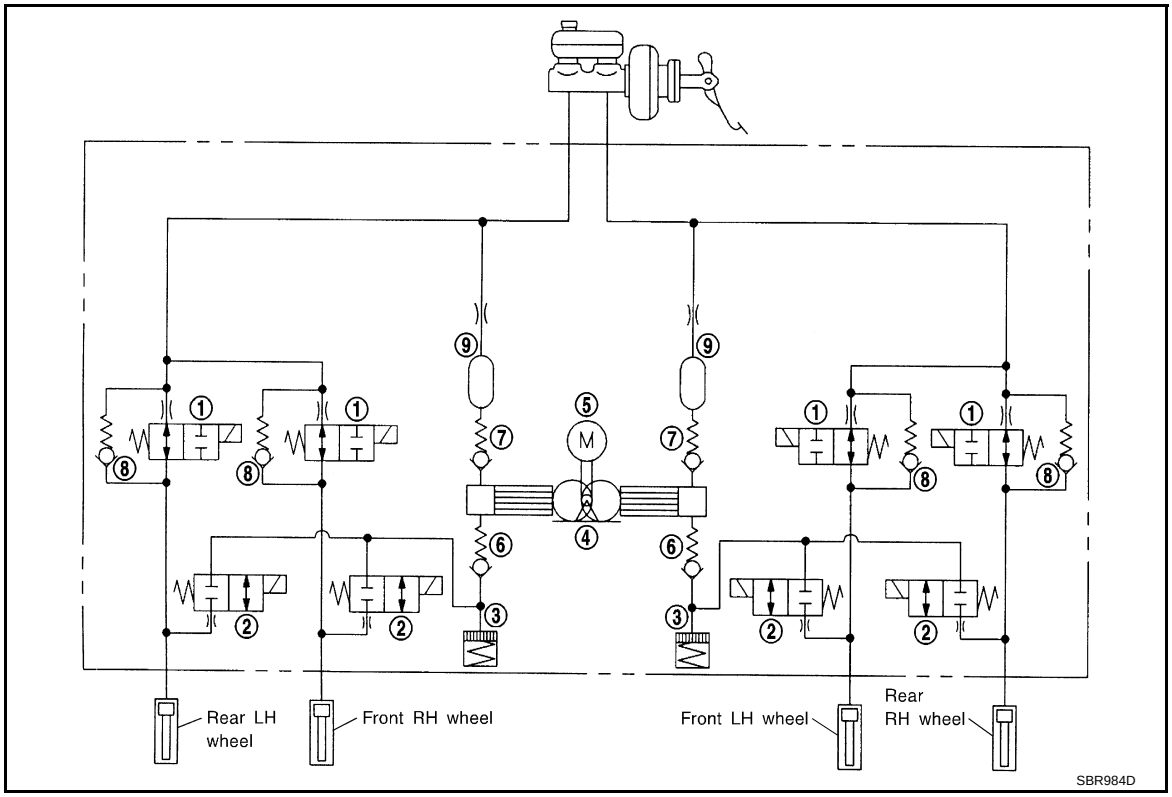
FAIL SAFE

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

ELECTRICAL COMPONENTS



HYDRAULIC CIRCUIT DIAGRAM



1. Inlet solenoid valve
2. Outlet solenoid valve
3. Reservoir
4. Pump
5. Motor
6. Inlet valve
7. Outlet valve
8. Bypass check valve
9. Damper

OPERATION THAT IS NOT "SYSTEM ERROR"

ABS

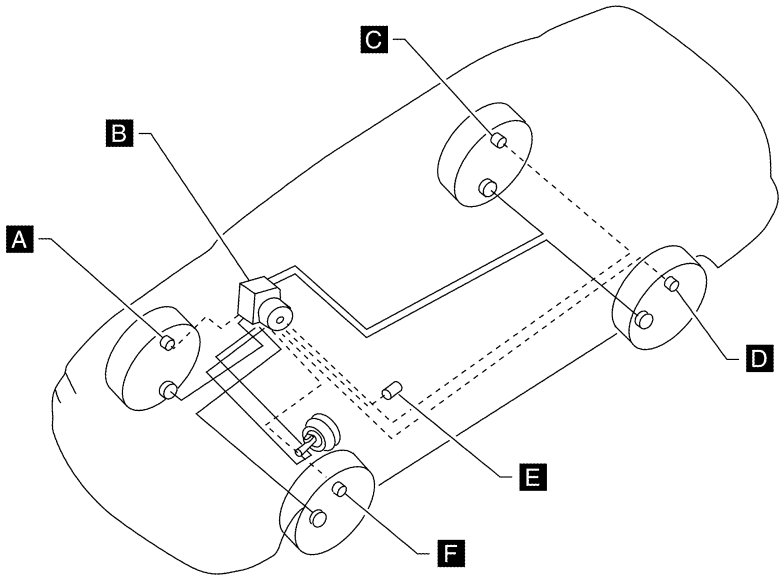
- When starting engine or just after starting vehicle, brake pedal may vibrate or the motor operating sound may be heard from engine room. This is a normal states of the operation check.
- During ABS operation, brake pedal lightly vibrates and a mechanical sound may be heard. This is normal.
- Stopping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

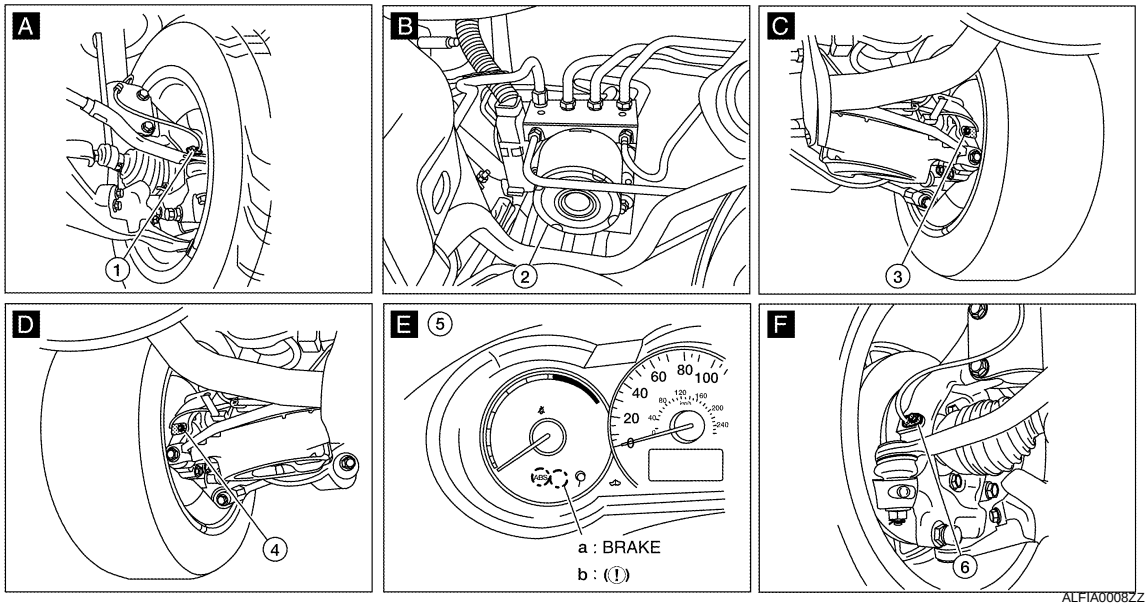
CAN Communication

Refer to LAN-7, "System Description".

Component Parts Location

INFOID:0000000000992461





1. Front wheel sensor RH E41
2. ABS actuator and electric unit (control unit) E26
3. Rear wheel sensor RH B43
4. Rear wheel sensor LH B43
5. Combination meter M24
   a. US models
   b. Canada models
6. Front wheel sensor LH E19

Component Description

INFOID:0000000000992462

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-25, "Description"
	Motor	
	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:0000000000992463

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 BRC-37, "Component Function Check".
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.
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-47, "CONSULT-III Data Link Connector (DLC) Circuit".
   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
RR RH SENSOR-1 [C1101]*1	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	BRC-16, "Diagnosis Procedure" (Note 1)
RR LH SENSOR-1 [C1102]*1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
FR RH SENSOR-1 [C1103]*1	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
FR LH SENSOR-1 [C1104]*1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
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.	BRC-19, "Diagnosis Procedure" (Note 1)
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.	
FR RH SENSOR-2 [C1107]*1	When the circuit in the front RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
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.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-22, "Diagnosis Procedure"
CONTROLLER FAILURE [C1110]*2	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-24, "Diagnosis Procedure"
PUMP MOTOR [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.	BRC-25, "Diagnosis Procedure"
	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	
MAIN RELAY [C1114]	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, "Diagnosis Procedure"
	During the actuator relay operating with ON, when the actuator relay turns OFF, or when the control line for the relay is open.	
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input signal is malfunctioning.	BRC-29, "Diagnosis Procedure" (Note 1)
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-32, "Diagnosis Procedure"
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-34, "Diagnosis Procedure"
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-32, "Diagnosis Procedure"
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-34, "Diagnosis Procedure"

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, "Diagnosis Procedure"
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-34, "Diagnosis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-32, "Diagnosis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-34, "Diagnosis Procedure"
CAN COMM CIRCUIT [U1000]*3	When there is a malfunction in the CAN communication circuit.	BRC-36, "Diagnosis 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 BRC-36, "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 (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
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 (control 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.
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 (Note)	ABS solenoid valve			ABS solenoid valve (ACT)		
	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.

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.

COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:0000000000992464

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:0000000000992465

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.	• Harness or connector • Wheel sensor • ABS actuator and electric unit (control unit)
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
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 CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-16, "Diagnosis Procedure".
NO >> INSPECTION END

DTC Confirmation Procedure

Diagnosis Procedure

INFOID:0000000000992466

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.

OK or NG

OK >> GO TO 2.
NG >> 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.

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 BRC-58, "Removal and Installation".

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

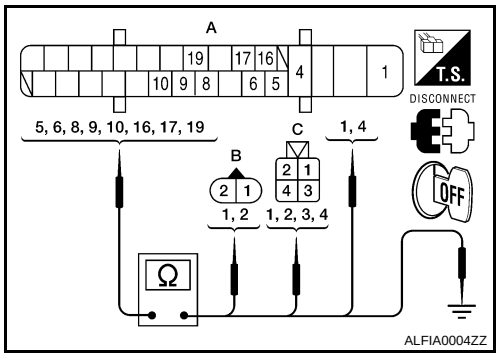
Check wheel bearing axial end play. Refer to FAX-5, "Inspection" (front) or RAX-5, "On-vehicle Service" (rear).

OK or NG

OK >> GO TO 5..
NG >> Repair or replace as necessary. Refer to FAX-7, "Removal and Installation" (front) or RAX-6, "Removal and Installation" (rear).

5.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.)



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

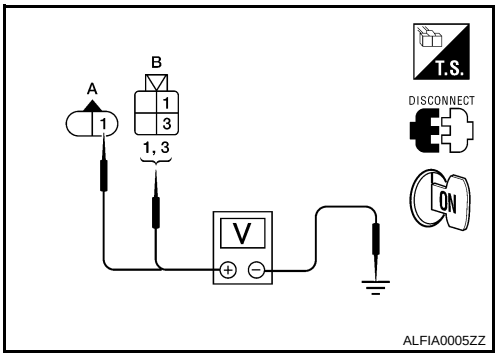
OK or NG

OK >> GO TO 6..
NG >> • Repair or replace malfunctioning components.

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

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)	1	—	8 V or more
Front LH (A)			
Rear LH (B)			
Rear RH (B)	3		

OK or NG

OK >> Inspection end.
NG >> Replace ABS actuator and electric unit (control unit).

Component Inspection

INFOID:0000000000992467

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-16, "Diagnosis Procedure".

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

INFOID:0000000000992468

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:0000000000992469

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.	• 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.	
C1107	FR RH SENSOR-2	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
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 BRC-19, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992470

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.

OK or NG

OK >> GO TO 2.
NG >> 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.

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 BRC-58, "Removal and Installation".

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

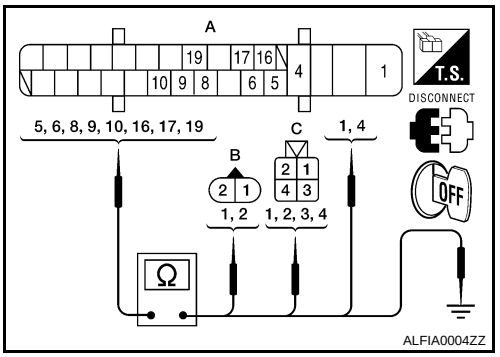
Check wheel bearing axial end play. Refer to FAX-5, "Inspection" (front) or RAX-5, "On-vehicle Service" (rear).

OK or NG

OK >> GO TO 5..
NG >> Repair or replace as necessary. Refer to FAX-7, "Removal and Installation" (front) or RAX-6, "Removal and Installation" (rear).

5.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.)



	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

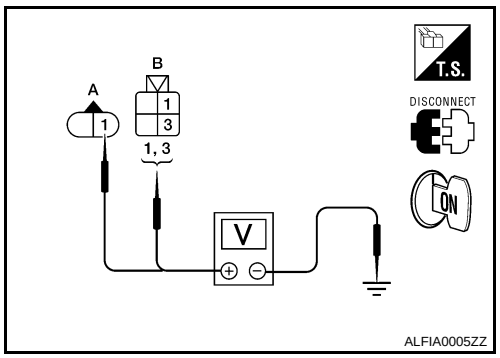
Power supply circuit : Continuity should exist.
Signal circuit : Continuity should exist.
Ground circuit : Continuity should not exist.

OK or NG

OK >> GO TO 6..
NG >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows “NO DTC IS DETECTED”.

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)	1	—	8 V or more
Front LH (A)			
Rear LH (B)			
Rear RH (B)	3		

OK or NG

OK >> Inspection end.
NG >> Replace ABS actuator and electric unit (control unit).

Component Inspection

INFOID:0000000000992471

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

Is the inspection result normal?

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

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

Description

INFOID:0000000000992472

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

DTC Logic

INFOID:0000000000992473

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-22, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992474

INSPECTION PROCEDURE

1.CHECK CONNECTOR

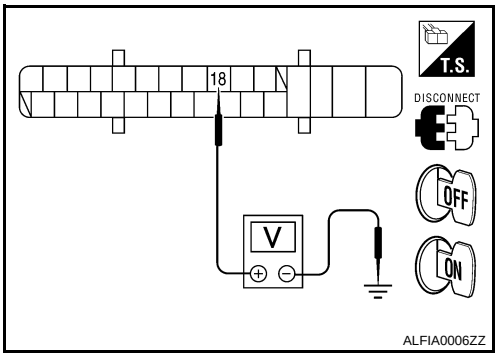
1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
2. Reconnect connector and perform self-diagnosis.

OK or NG

OK >> INSPECTION END
NG >> GO TO 2..

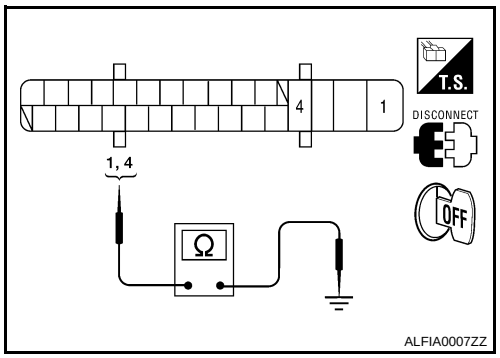
2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY CIRCUIT AND GROUND CIRCUIT

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.



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

OK or NG

OK >> • 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″.

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

DTC C1110 CONTROL FAILURE

DTC Logic

INFOID:0000000000992475

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 BRC-24, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992476

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

Description

INFOID:0000000000992477

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:0000000000992478

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-25, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992479

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.

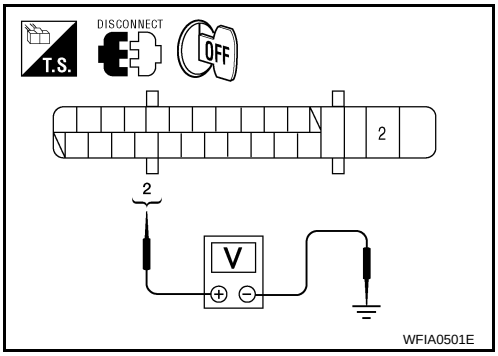
OK or NG

OK >> Inspection end.
NG >> GO TO 2..

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.

2. 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)

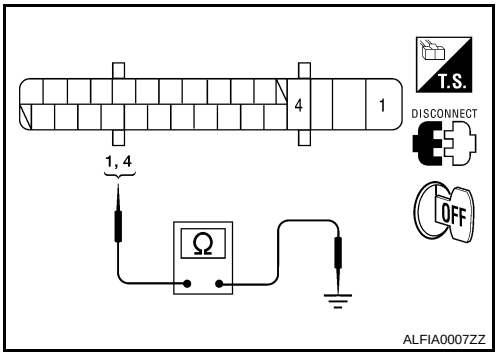
OK or NG

OK >> GO TO 3..

NG >> • 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

OK or NG

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

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

Component Inspection

INFOID:0000000000992480

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 BRC-25, "Diagnosis Procedure".

DTC C1114 MAIN RELAY

Description

INFOID:0000000000992481

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

DTC Logic

INFOID:0000000000992482

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 (control unit)
		During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open.	

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 BRC-27, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992483

INSPECTION PROCEDURE

1.CHECK CONNECTOR

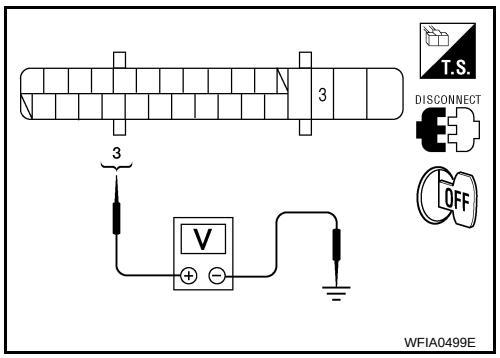
1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
2. Reconnect connector and perform self-diagnosis.

OK or NG

OK >> Inspection end.
NG >> 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.
2. Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.



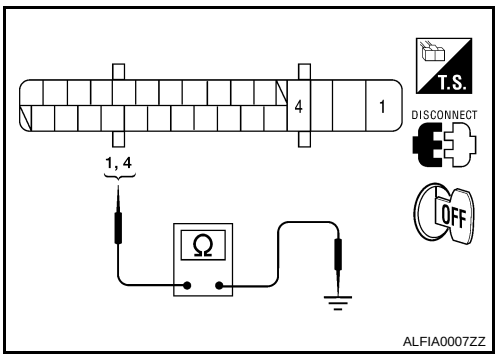
ABS actuator and electric unit (contorl unit)	Ground	Voltage
3	—	Battery voltage (Approx. 12 V)

OK or NG

OK >> GO TO 3..
NG >> • 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 (contorl unit)	Ground	Continuity
1, 4	—	Yes

OK or NG

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

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

Component Inspection

INFOID:0000000000992484

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 BRC-27, "Diagnosis Procedure".

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

Description

INFOID:0000000000992485

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:0000000000992486

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 BRC-29, "Diagnosis Procedure".
NO >> Inspection end.

Diagnosis Procedure

INFOID:0000000000992487

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.

OK or NG

OK >> GO TO 3..
NG >> • 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

1. 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.
2. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-12, "CONSULT-III Function (ABS)".

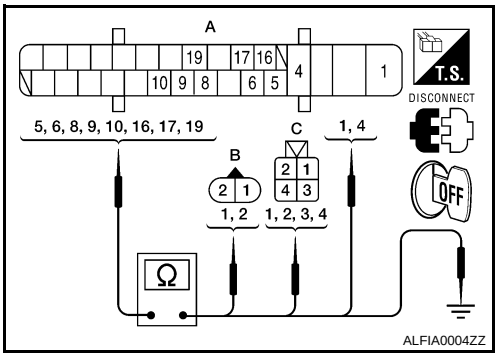
OK or NG

OK >> Inspection end.

NG >> GO TO 4..

4.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.)



	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) (A) (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.
Signal circuit : Continuity should exist.
Ground circuit : Continuity should not exist.

OK or NG

OK >> GO TO 5..
NG >> • 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.
2. 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?

OK >> Inspection end.
NG >> • 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

INFOID:0000000000992488

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

Is the inspection result normal?

YES >> Inspection end.
NO >> Go to diagnosis procedure. Refer to BRC-29, "Diagnosis Procedure".

C1120, C1122, C1124, C1126 IN ABS SOL

Description

INFOID:0000000000992489

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:0000000000992490

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.	• ABS actuator and electric unit (control unit)
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH inlet solenoid circuit.	
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH inlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-32, "Diagnosis Procedure".
NO >> Inspection end.

Diagnosis Procedure

INFOID:0000000000992491

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.

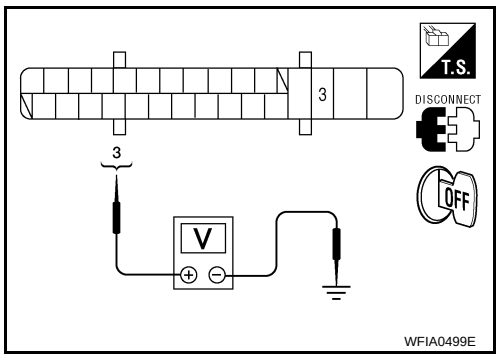
OK or NG

OK >> Inspection end.
NG >> 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.

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



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

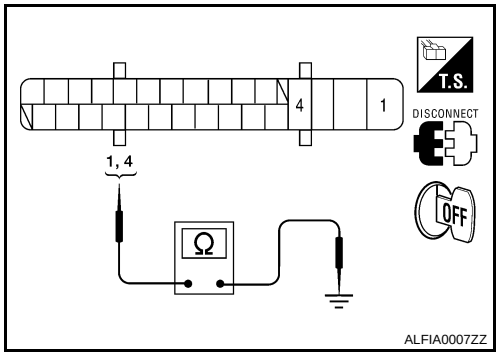
OK or NG

OK >> GO TO 3..

NG >> • 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 (contorl unit)	Ground	Continuity
1, 4	—	Yes

OK or NG

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

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

Component Inspection

INFOID:0000000000992492

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 BRC-32, "Diagnosis Procedure".

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

INFOID:0000000000992493

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:0000000000992494

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.	• ABS actuator and electric unit (control unit)
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-34, "Diagnosis Procedure".
NO >> Inspection end.

Diagnosis Procedure

INFOID:0000000000992495

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.

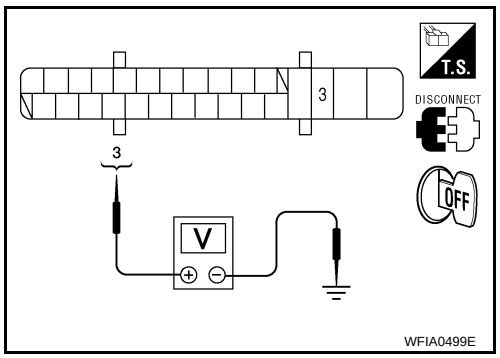
OK or NG

OK >> Inspection end.
NG >> 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.

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



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

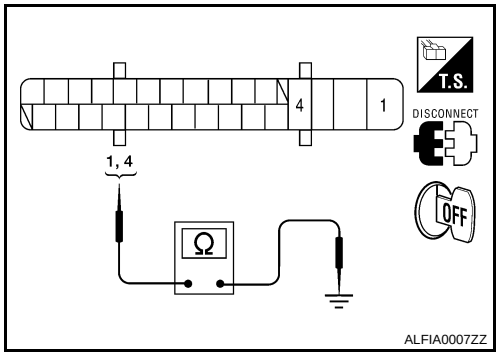
OK or NG

OK >> GO TO 3..

NG >> • 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 (contorl unit)	Ground	Continuity
1, 4	—	Yes

OK or NG

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

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

Component Inspection

INFOID:0000000000992496

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 BRC-34, "Diagnosis Procedure".

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000000992497

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:0000000000992498

DTC DETECTION LOGIC

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

Diagnosis Procedure

INFOID:0000000000992499

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 GI-47, "Description".
NO >> Inspection end.

ABS WARNING LAMP

Description

INFOID:0000000000992500

×: 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:0000000000992501

1.CHECK ABS WARNING LAMP OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-37, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000000992502

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-12, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-3, "Work Flow".

Is the inspection result normal?

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

BRAKE WARNING LAMP

Description

INFOID:0000000000992503

×: 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:0000000000992504

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 BRC-38, "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 BRC-185, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000000992505

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 BRC-185, "Diagnosis Procedure".

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 MWI-3, "Work Flow".

Is the inspection result normal?

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

ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000000992506

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	Wheel speed	0 [km/h]	Vehicle stopped
		Nearly matches the speed meter display (± 10 % or less)	Vehicle running (Note 1)
STOP LAMP SW	Brake pedal operation	When brake pedal is depressed	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
SLCT LVR POSI	A/T shift position	P position R position N position D position	P R N D
PARK BRAKE SW	Parking brake switch	Parking brake switch is active	ON
		Parking brake switch is inactive	OFF
FR RH IN SOL FR RH OUT SOL FR LH IN SOL FR LH OUT SOL RR RH IN SOL RR RH OUT SOL RR LH IN SOL RR LH OUT SOL	Operation status of all solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY (Note 2)	Actuator relay operation	When the actuator relay is operating	ON
		When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp (Note 3)	When ABS warning lamp is ON	ON
		When ABS warning lamp is OFF	OFF
ABS SIGNAL	ABS operation	ABS is active	ON
		ABS is inactive	OFF

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

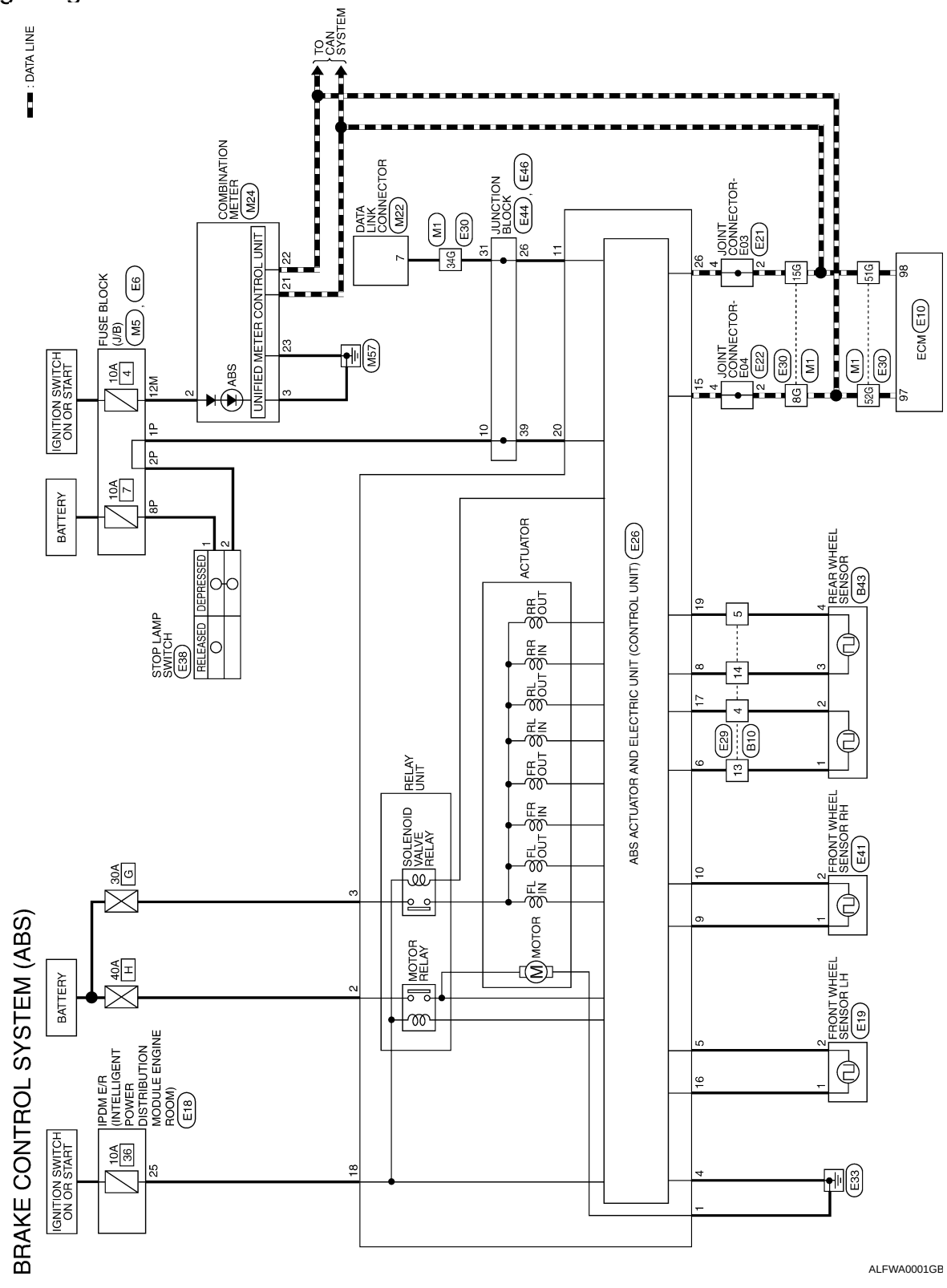
Note 1: Confirm tire pressure is normal.

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)".

Wiring Diagram

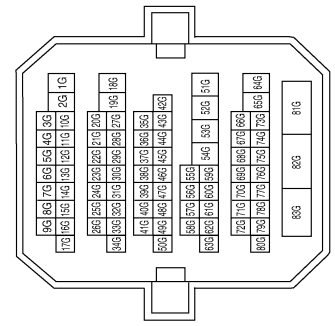
INFOID:0000000000992507



BRAKE CONTROL SYSTEM (ABS) CONNECTORS

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE

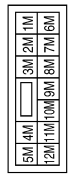
H.S.



Terminal No.	Color of wire	Signal Name
8G	P	–
15G	L	–
34G	O	–
51G	L	–
52G	P	–

Connector No.	M5
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

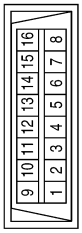
H.S.



Terminal No.	Color of wire	Signal Name
12M	P	–

Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Color	WHITE

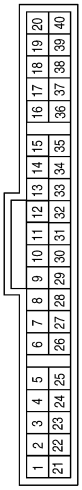
H.S.



Terminal No.	Color of wire	Signal Name
7	O	K-LINE

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

H.S.



Terminal No.	Color of wire	Signal Name
2	O	IGN
3	B	GND
21	L	CAN-H
22	P	CAN-L
23	B	GND

Connector No.	E6
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
1P	SB	–
2P	R/G	–
8P	Y/R	–

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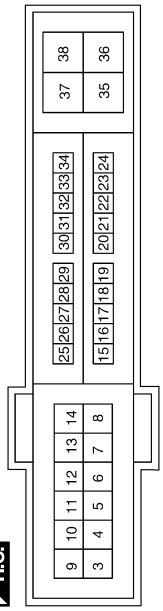
Connector No.	E19
Connector Name	FRONT WHEEL SENSOR LH
Connector Color	GRAY

H.S.

Terminal No.	Color of wire	Signal Name
1	G	–
2	R	–

Connector No.	E18
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

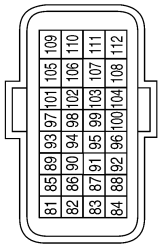
H.S.



Terminal No.	Color of wire	Signal Name
25	GR	ABS_ECU

Connector No.	E10
Connector Name	ECM
Connector Color	BLACK

H.S.



Terminal No.	Color of wire	Signal Name
97	P	CAN-L
98	L	CAN-H

Connector No.	E22
Connector Name	JOINT CONNECTOR-E04
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
2	P	–
4	P	–

Connector No.	E21
Connector Name	JOINT CONNECTOR-E03
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
2	L	–
4	L	–

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Connector No.	E26
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color	BLACK

H.S.

Terminal No.	Color of wire	Signal Name
1	B	MGND
2	G/R	UB (MR)
3	R/B	UB (VR)
4	B	GND

Terminal No.	Color of wire	Signal Name
5	R	DS FL
6	L/Y	DP RL
8	W/R	DP RR
9	B	DP FR
10	W	DS FR
11	O	DIAG-K
15	P	CAN-L
16	G	DP FL
17	R/W	DS RL
18	GR	IGN
19	B/R	DS RR
20	P/B	BLS
26	L	CAN-H

Connector No.	E29
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
4	R/W	–
5	B/R	–
13	L/Y	–
14	W/R	–

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
8G	P	–
15G	L	–
34G	O	–
51G	L	–
52G	P	–

Connector No.	E38
Connector Name	STOP LAMP SWITCH (WITH CVT)
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
1	Y/R	–
2	R/G	–
3	G/R	–
4	R/W	–

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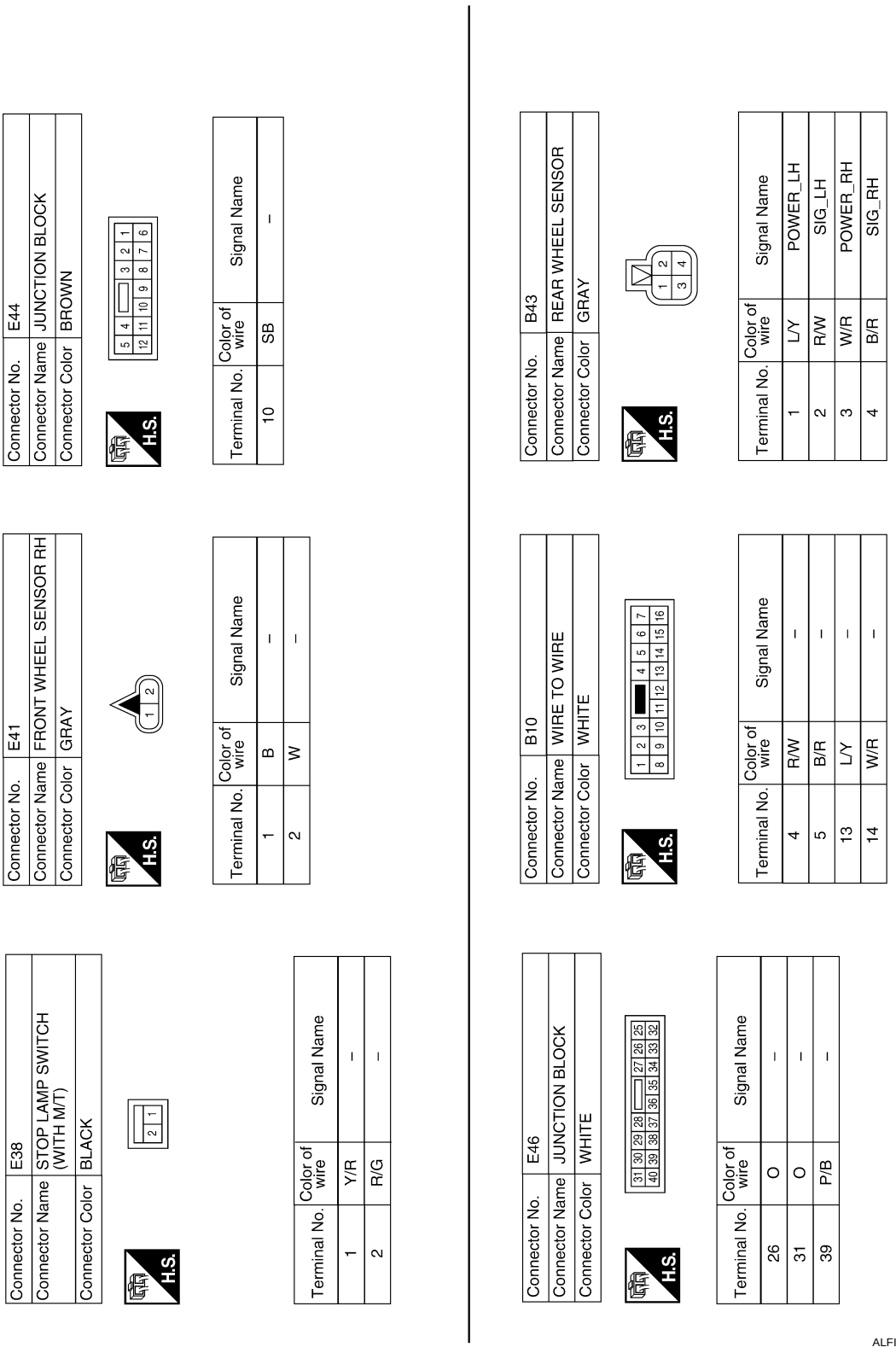

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Fail-Safe

INFOID:0000000000992508

ABS SYSTEM

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 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:0000000000992509

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 outside the standard.	BRC-16, "Diagnosis Procedure" (Note 1)
RR LH SENSOR-1 [C1102]*1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
FR RH SENSOR-1 [C1103]*1	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
FR LH SENSOR-1 [C1104]*1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
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.	BRC-19, "Diagnosis Procedure" (Note 1)
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.	
FR RH SENSOR-2 [C1107]*1	When the circuit in the front RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
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.	
BATTERY VOLTAGE [ABNORMAL] [C1109]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-22, "Diagnosis Procedure"
CONTROLLER FAILURE [C1110]*2	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-24, "Diagnosis Procedure"
PUMP MOTOR [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.	BRC-25, "Diagnosis Procedure"
	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	
MAIN RELAY [C1114]	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, "Diagnosis Procedure"
	During the actuator relay operating with ON, when the actuator relay turns OFF, or when the control line for the relay is open.	
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input signal is malfunctioning.	BRC-29, "Diagnosis Procedure" (Note 1)
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-32, "Diagnosis Procedure"
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-34, "Diagnosis Procedure"
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-32, "Diagnosis Procedure"
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-34, "Diagnosis Procedure"

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, "Diagnosis Procedure"
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-34, "Diagnosis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-32, "Diagnosis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-34, "Diagnosis Procedure"
CAN COMM CIRCUIT [U1000]*3	When there is a malfunction in the CAN communication circuit.	BRC-36, "Diagnosis 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 Refer to Service Manual.

SYMPTOM DIAGNOSIS

ABS

Symptom Table

INFOID:0000000000992510

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

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-49, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-50, "Diagnosis Procedure"
	Make sure the braking force is sufficient when the ABS is not operating.	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-51, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-52, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-53, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	

NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal.

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

Diagnosis Procedure

INFOID:0000000000992511

1.CHECK START

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

OK or NG

OK >> GO TO 2..
NG >> 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: FAX-7, "Removal and Installation", Rear: RAX-6, "Removal and Installation".

OK or NG

OK >> GO TO 3..
NG >> 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.

OK or NG

OK >> GO TO 4..
NG >> • 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.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-9, "System Description".

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000000992512

1.CHECK BRAKE PEDAL STROKE

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 BR-15, "Bleeding Brake System".
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: BR-44, "Brake Pedal", brake booster and master cylinder: BR-44, "Brake Booster".

NO >> GO TO 2..

2.CHECK FUNCTION

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

OK or NG

OK >> GO TO procedure 3 “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom 1. Refer to BRC-48, "Symptom Table".

NG >> Check brake system.

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000000992513

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.

OK or NG

OK >> GO TO procedure 3 “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom 1. Refer to BRC-48, "Symptom Table".

NG >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000000992514

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.

OK or NG

OK >> GO TO procedure 3 “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom 1. Refer to BRC-48, "Symptom Table".

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

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000000992515

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 BRC-12, "CONSULT-III Function (ABS)".

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-48, "Symptom Table".

NORMAL OPERATING CONDITION

Description

INFOID:0000000000992516

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

PRECAUTION

PRECAUTIONS

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

INFOID:0000000000992517

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 SRS and SB section of this Service Manual.

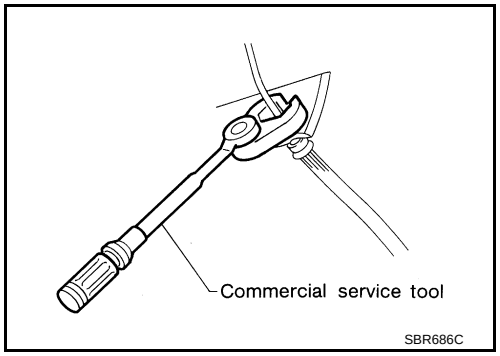
WARNING:

- **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 SRS 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

INFOID:0000000000992518

- 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:0000000000992519

- 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: Suspension-related parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related

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

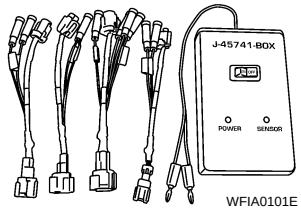
PREPARATION

PREPARATION

Special Service Tool

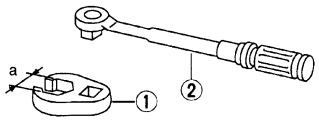
INFOID:0000000000992520

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  WFIA0101E	Checking operation of ABS active wheel sensor

Commercial Service Tool

INFOID:0000000000992521

Tool name	Description
1. Flare nut crowfoot 2. Torque wrench  S-NT360	Removing and installing brake piping **a: 10mm (0.39 in)/12mm (0.47 in)**

ON-VEHICLE REPAIR

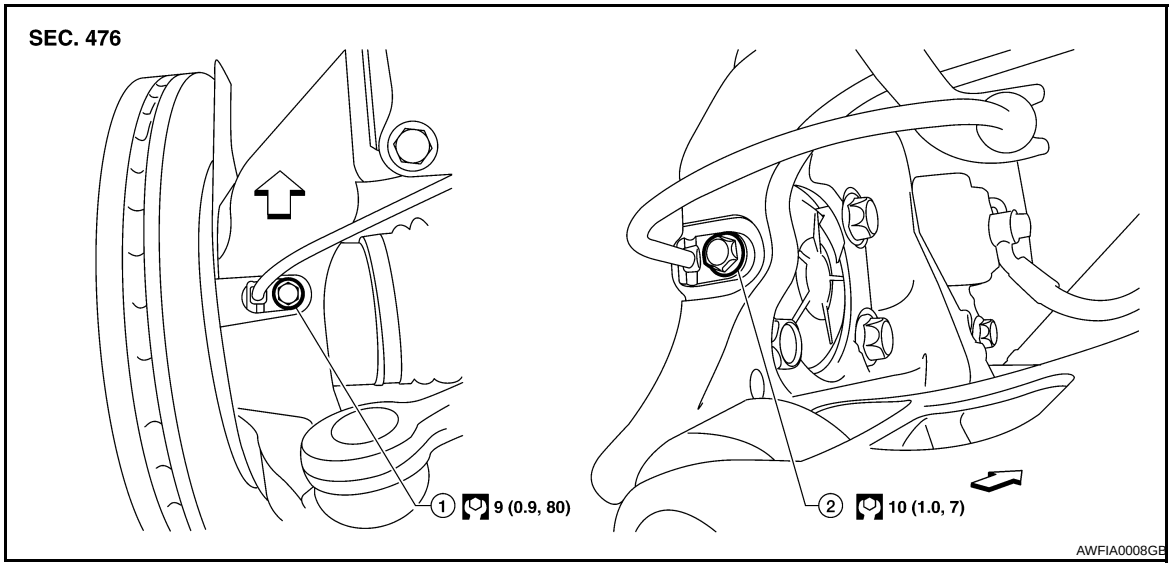
WHEEL SENSORS

Exploded View

INFOID:0000000000992522

Removal and Installation

INFOID:0000000000992523



1. Front wheel sensor
2. Rear wheel sensor
⇐ Front

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 mounting 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 mounting the wheel sensor, or if a foreign object is caught in the surface of the mounting for the rotor. If something wrong is found, fix it and then install the wheel sensor.

REMOVAL

Front

1. Remove wheel and tire using power tool.
2. Partially front wheel fender protector. Refer to EXT-18, "Removal and Installation".
3. Remove wheel sensor bolt and wheel sensor.
4. Remove harness wire from mounts and disconnect wheel sensor harness connector.

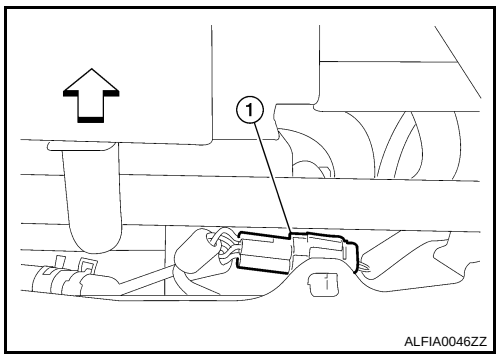
Rear

NOTE:

Both 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.
3. Remove harness wire from mounts and harness wire clips from suspension member.

4. Disconnect wheel sensor harness connector (1).



INSTALLATION

Installation is in the reverse order of removal.

- When installing wheel and tire, refer to WT-31, "Inspection".

SENSOR ROTOR

Removal and Installation

INFOID:0000000000992524

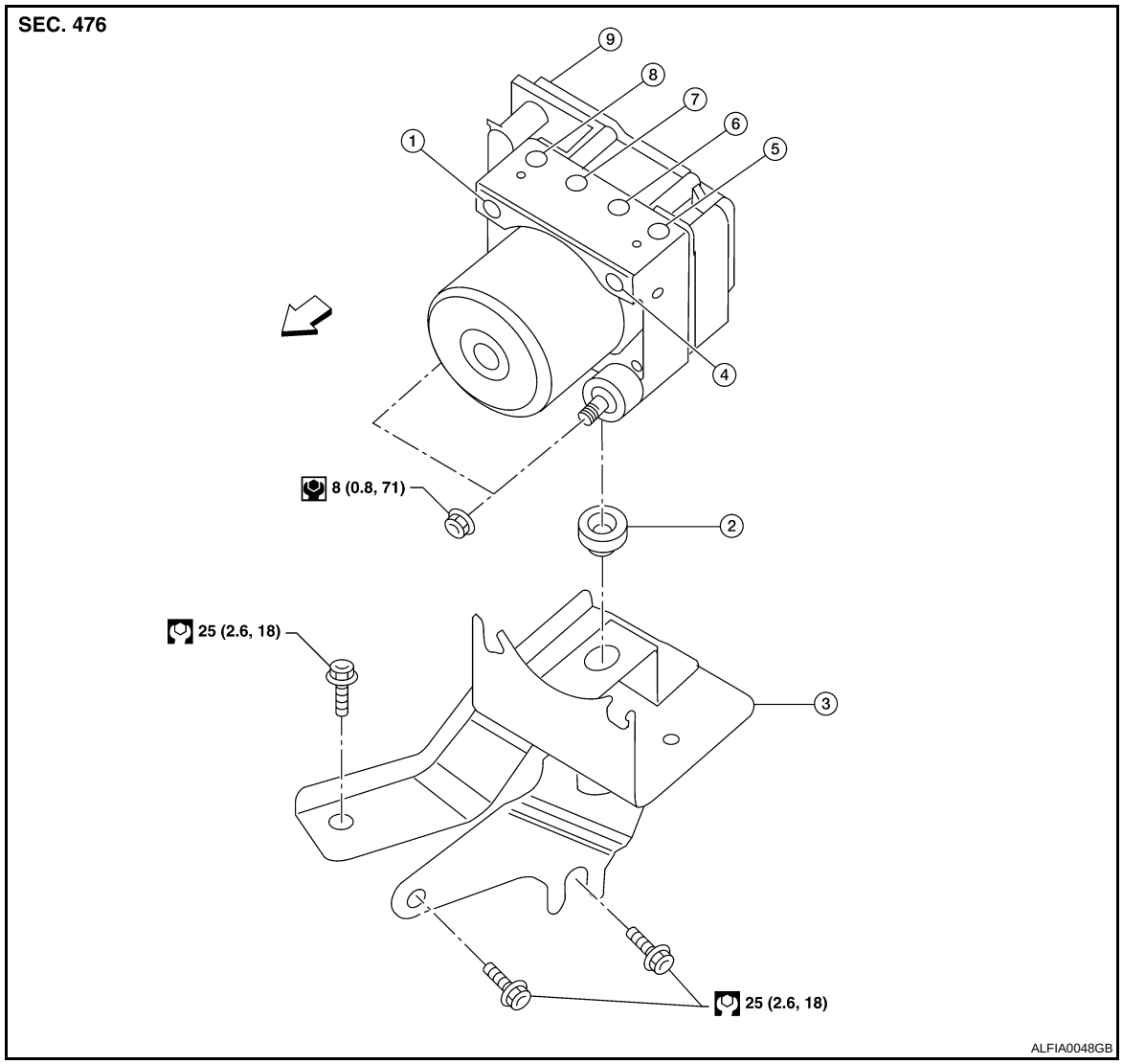
The front and rear wheel sensor rotors are an integral part of the wheel hub assemblies and can not be disassembled. When replacing the sensor rotor, replace the wheel hub assembly. Refer to FAX-7, "Removal and Installation" (Front), RAX-6, "Removal and Installation" (Rear).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:0000000000992525

COMPONENT



1.	From master cylinder secondary side	2.	Grommet	3.	Bracket
4.	From master cylinder primary side	5.	To front LH brake caliper	6.	To rear RH brake caliper
7.	To rear LH brake caliper	8.	To front RH brake caliper	9.	ABS actuator and electric unit
⇐	Front				

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

Removal and Installation

INFOID:0000000000992526

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".**

1. Remove front wiper arms. Refer to WW-35, "FRONT WIPER ARMS : Removal and Installation".
2. Remove cowl top. Refer to EXT-17, "Removal and Installation".
3. Disconnect washer hose.
4. Remove tower bar, if equipped. Refer to FSU-13, "Exploded View".
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.

INSTALLATION

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".**
- **After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked.**

Installation is the reverse order of removal.

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

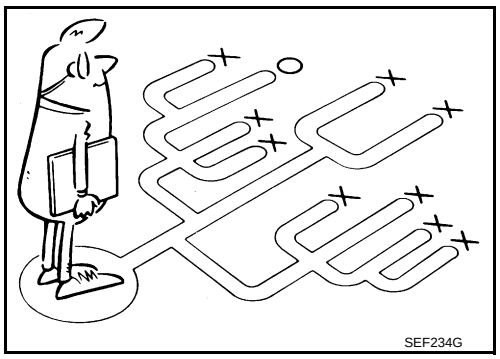
Work Flow

INFOID:0000000000992527

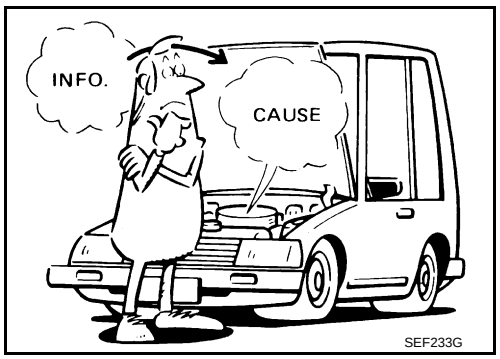
DESCRIPTION

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”.


SEF234G

- 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-71, "CONSULT-III Function (ABS)".
- Always read “GI General Information” to confirm general precautions. Refer to GI-25, "General Precautions".



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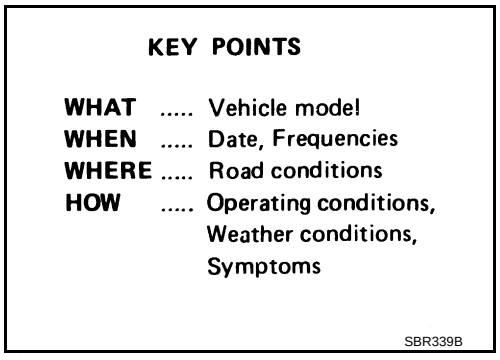
Asking Complaints

- 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.



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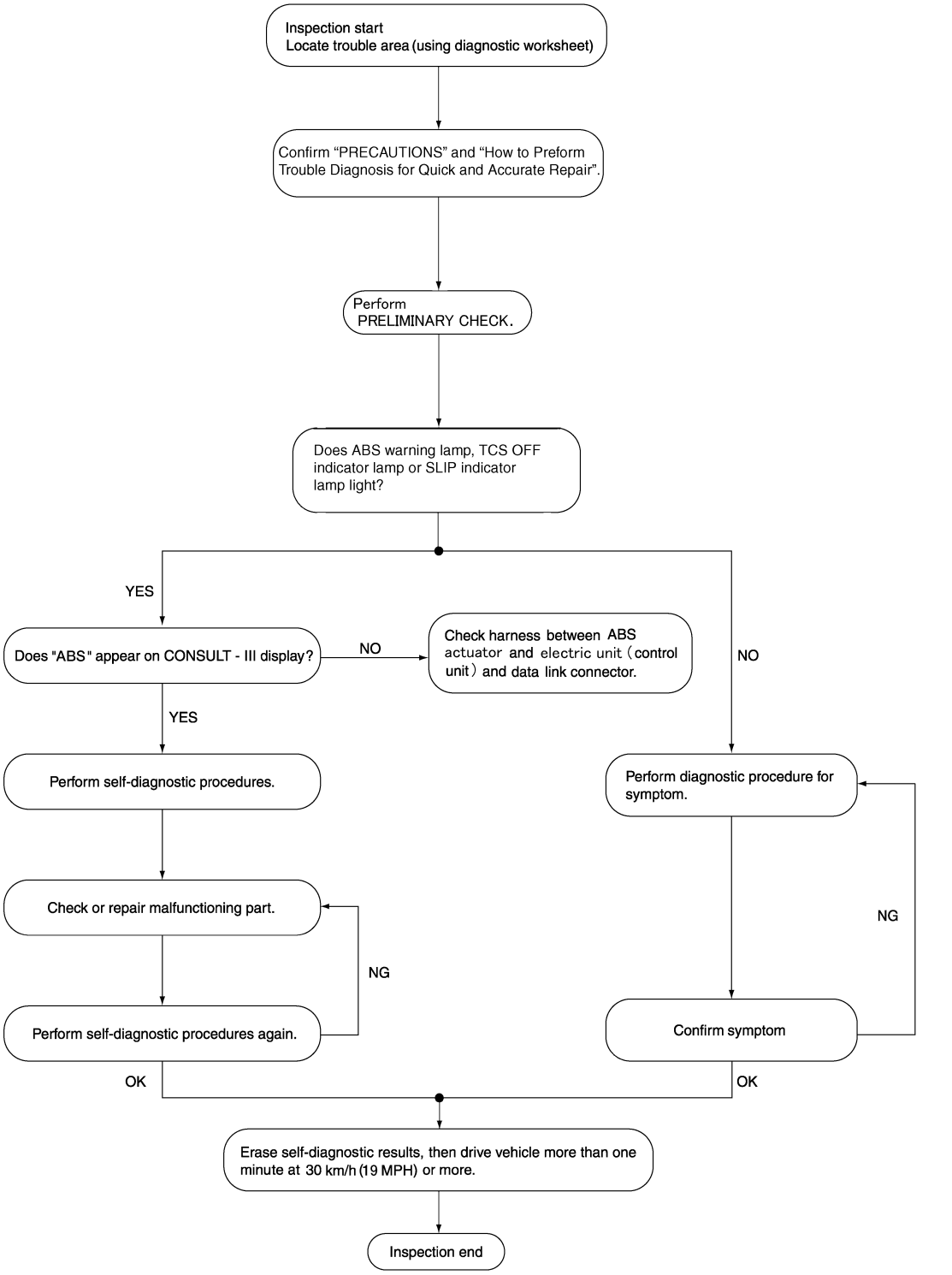
OVERALL SEQUENCE



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Diagnostic Work Sheet

INFOID:0000000000992528

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

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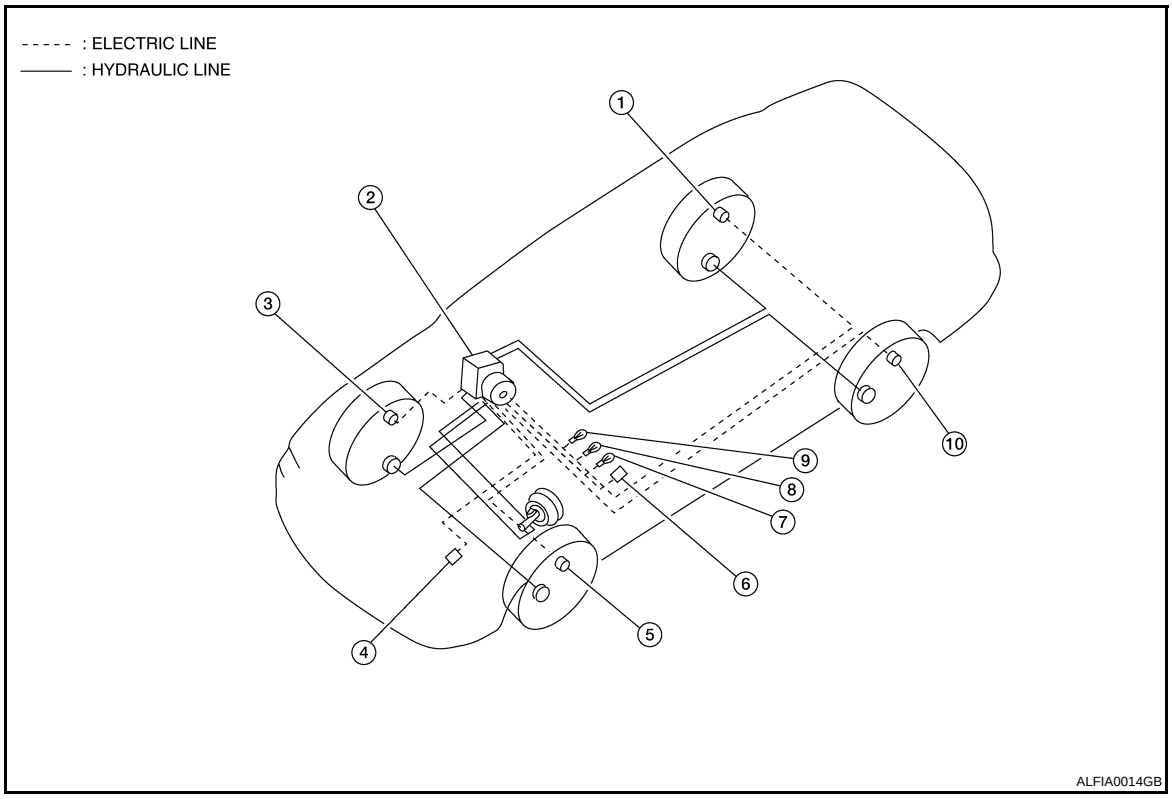
FUNCTION DIAGNOSIS

TCS

System Diagram

INFOID:0000000000992529



1. Rear RH wheel sensor
2. ABS actuator and electric unit (control unit)
3. Front RH wheel sensor
4. ECM
5. Front LH wheel sensor
6. TCF OFF switch
7. ABS Warning lamp indicator (combination meter)
8. SLIP indicator lamp (combination meter)
9. TCS OFF indicator lamp (combination meter)
10. Rear LH wheel sensor

System Description

INFOID:0000000000992530

CAUTION:
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.

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

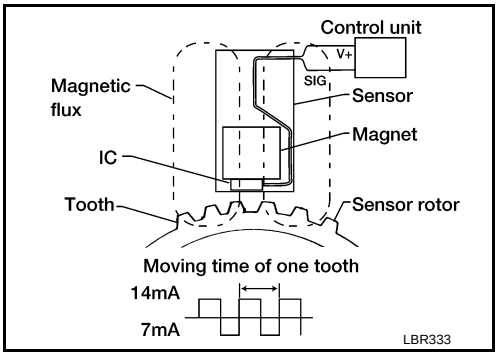
- Electronic Brake Distribution is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the brake fluid pressure which results in reduced rear wheel slippage.
- If the electrical system malfunctions, 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

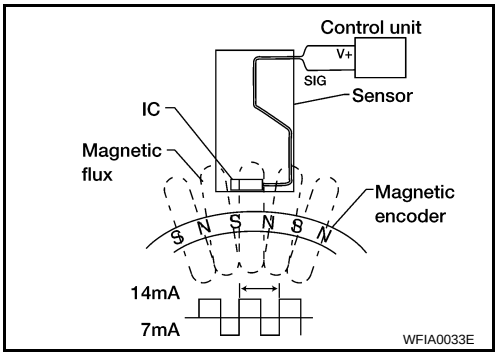
- Spinning of the drive wheels is detected by the ABS/TCS control unit using inputs from the wheel speed sensors. If wheel spin occurs, the drive wheel right and left brake fluid pressure control and engine fuel cut are conducted while the throttle value is restricted to reduce the engine torque and 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

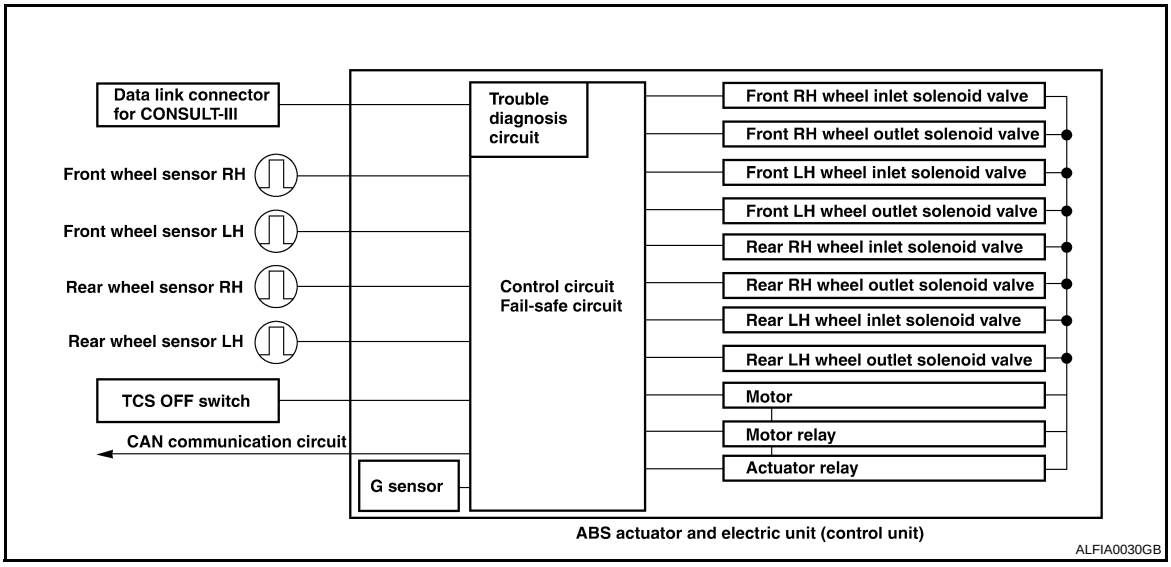
The front sensor units consist of a gear-shaped sensor rotor and a sensor element. The element contains a magnet around which a coil is wound. The front wheel sensors are installed on the front of the wheel knuckles. As the wheel rotates, the sensor generates a square-wave signal. The frequency increases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



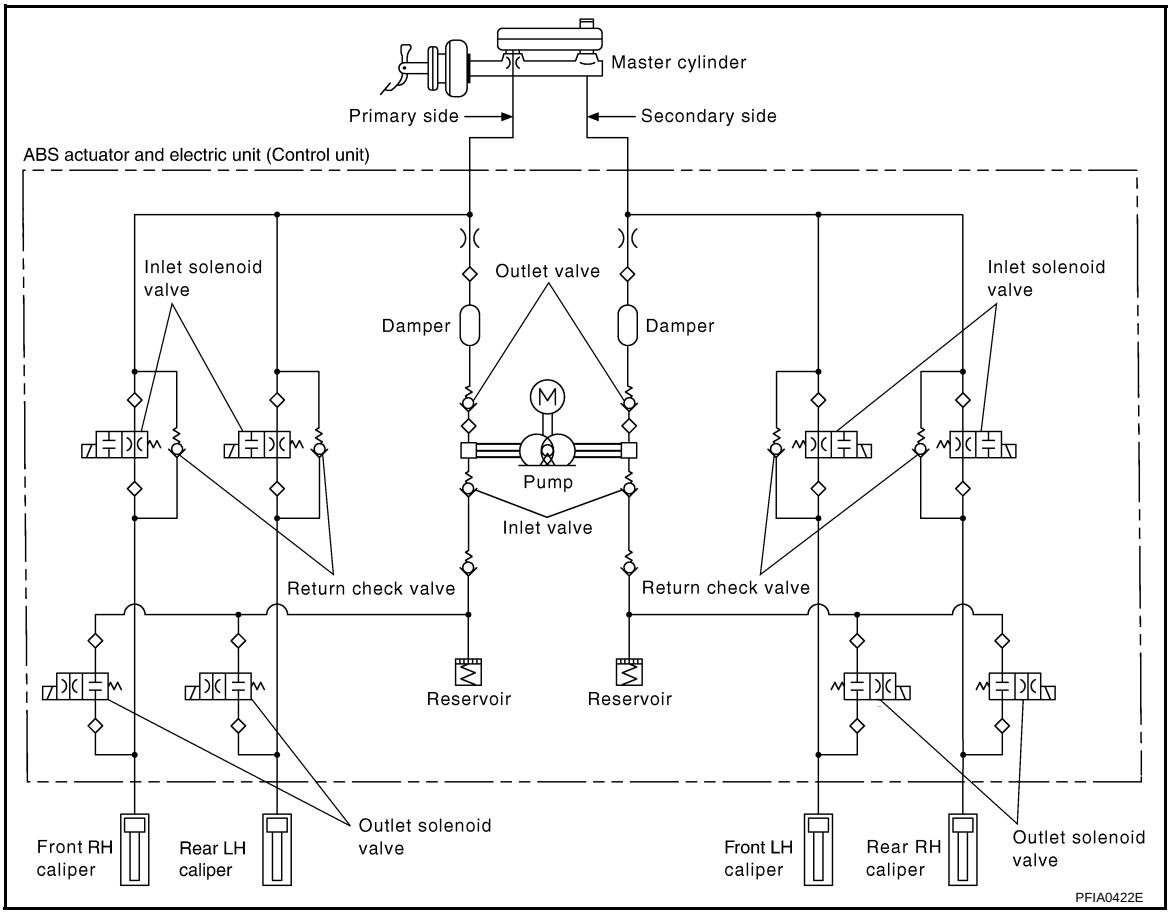
The rear sensor units consist of wheel hubs with a series of internal magnets and a sensor element. The rear wheel sensors are installed on the inner side of the wheel knuckles. As the wheel rotates, the sensor generates a square-wave signal. The frequency increases as the wheel speed increases.



ELECTRICAL COMPONENTS



HYDRAULIC CIRCUIT DIAGRAM



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 Refer to Service Manual.

Component Parts Location

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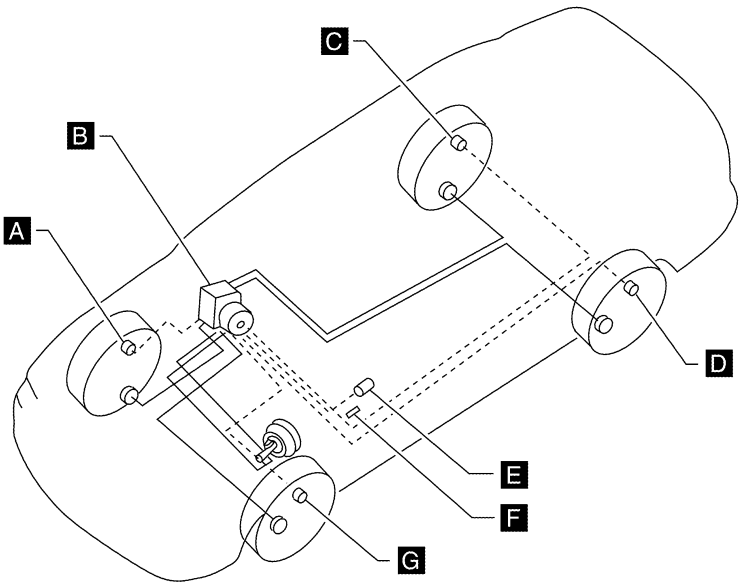

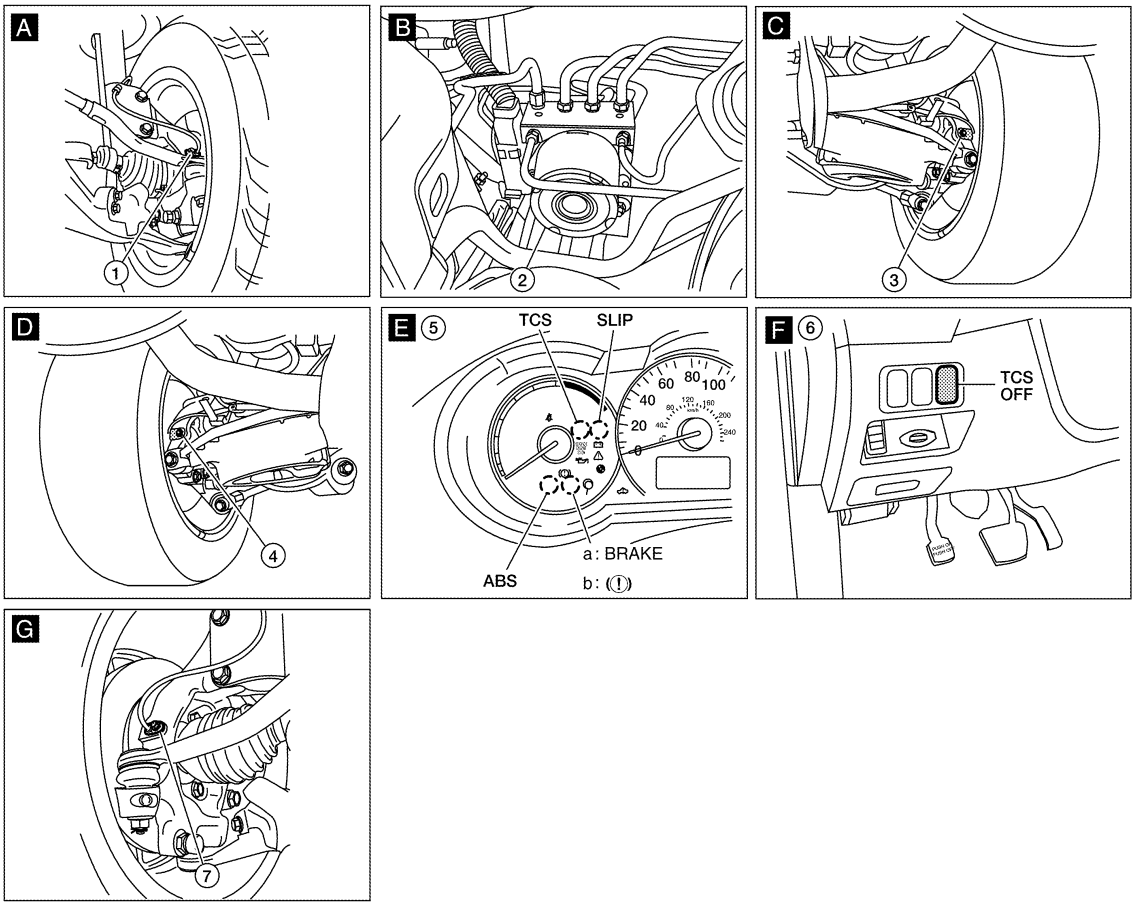

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1. Front wheel sensor RH E41
2. ABS actuator and electric unit (control unit) E26 (engine removed for clarity)
3. Rear wheel sensor RH B43
4. Rear wheel sensor LH B43
5. Combination meter M24
6. TCS ON/OFF switch M72
7. Front wheel sensor LH E19

Component Description

INFOID:0000000000992532

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-85, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-87, "Description"
	Solenoid valve	BRC-92, "Description"
Wheel sensor		BRC-76, "Description"
TCS OFF switch		BRC-100, "Description"
ABS warning lamp		BRC-98, "Description"
Brake warning lamp		BRC-99, "Description"

CONSULT-III Function (ABS)

INFOID:0000000000992533

SELF-DIAGNOSIS RESULTS

Operation Procedure

1. Turn ignition switch ON.
2. Start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
3. After stopping vehicle, with the engine running, touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS” in order on the CONSULT-III screen.
4. The self-diagnostic results are displayed.
   - 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-98, "Description".
5. Perform the appropriate inspection from display item list, and repair or replace the malfunctioning component.Refer to "Display Item List".
6. 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, 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

1. Turn ignition switch OFF.
2. Start engine and touch “START (NISSAN BASED VHCL)”, “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-47, "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.

NOTE:
- 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 OFF switch should not stay in the "ON" position.

Display Item List

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.	BRC-76, "Diagnosis Procedure" (Note)
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.	
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 distance 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-82, "Diagnosis Procedure"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-84, "Diagnosis Procedure"
PUMP MOTOR [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.	BRC-85, "Diagnosis Procedure"
	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	
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-87, "Diagnosis Procedure"
ABS SENSOR [C1115]	Teeth damage on sensor rotor or improper installation of wheel sensor.	BRC-89, "Diagnosis Procedure"
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-92, "Diagnosis Procedure"
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-94, "Diagnosis Procedure"
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-92, "Diagnosis Procedure"
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-94, "Diagnosis Procedure"
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	BRC-92, "Diagnosis Procedure"
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-94, "Diagnosis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-92, "Diagnosis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-94, "Diagnosis Procedure"

Display item	Malfunction detecting condition	Check item
ENGINE SIGNAL 1 [C1130]	Fuel cut control abnormal.	BRC-96, "Diagnosis Procedure"
ENGINE SIGNAL 2 [C1131]	Electric throttle control abnormal.	
ENGINE SIGNAL 3 [C1132]	ECM CAN communication abnormal.	
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-97, "Diagnosis 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 (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
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 (control 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.

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 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 (Note)	ABS solenoid valve			ABS solenoid valve (ACT)		
	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.

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.

COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:0000000000992534

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:0000000000992535

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.	• Harness or connector • Wheel sensor • ABS actuator and electric unit (control unit)
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
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 CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-76, "Diagnosis Procedure".
NO >> INSPECTION END

DTC Confirmation Procedure

Diagnosis Procedure

INFOID:0000000000992536

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.

OK or NG

OK >> GO TO 2.
NG >> 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.

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 BRC-123, "Removal and Installation".

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

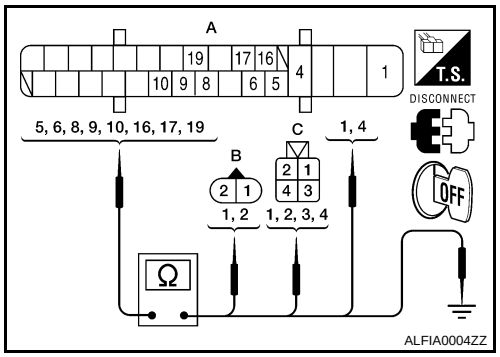
Check wheel bearing axial end play. Refer to FAX-5, "Inspection" (front) or RAX-5, "On-vehicle Service" (rear).

OK or NG

OK >> GO TO 5..
NG >> Repair or replace as necessary. Refer to FAX-7, "Removal and Installation" (front) or RAX-6, "Removal and Installation" (rear).

5.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.)



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

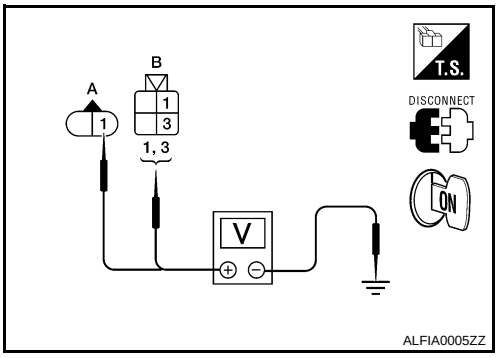
OK or NG

OK >> GO TO 6..
NG >> • Repair or replace malfunctioning components.

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

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)	1	—	8 V or more
Front LH (A)			
Rear LH (B)			
Rear RH (B)	3		

OK or NG

OK >> Inspection end.
NG >> Replace ABS actuator and electric unit (control unit).

Component Inspection

INFOID:0000000000992537

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-76, "Diagnosis Procedure".

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

INFOID:0000000000992538

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:0000000000992539

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.	• 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.	
C1107	FR RH SENSOR-2	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
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 BRC-79, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992540

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.

OK or NG

OK >> GO TO 2.
NG >> 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.

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 BRC-123, "Removal and Installation".

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

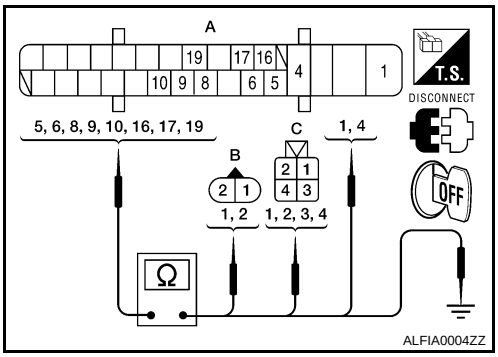
Check wheel bearing axial end play. Refer to FAX-5, "Inspection" (front) or RAX-5, "On-vehicle Service" (rear).

OK or NG

OK >> GO TO 5..
NG >> Repair or replace as necessary. Refer to FAX-7, "Removal and Installation" (front) or RAX-6, "Removal and Installation" (rear).

5.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.)



	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

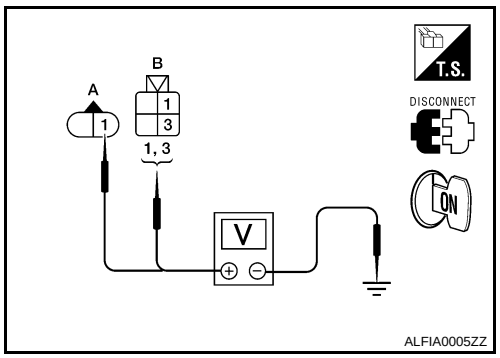
Power supply circuit : Continuity should exist.
Signal circuit : Continuity should exist.
Ground circuit : Continuity should not exist.

OK or NG

OK >> GO TO 6..
NG >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows “NO DTC IS DETECTED”.

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)	1	—	8 V or more
Front LH (A)			
Rear LH (B)			
Rear RH (B)	3		

OK or NG

OK >> Inspection end.
NG >> Replace ABS actuator and electric unit (control unit).

Component Inspection

INFOID:0000000000992541

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-79, "Diagnosis Procedure".

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

Description

INFOID:0000000000992542

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

DTC Logic

INFOID:0000000000992543

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-82, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992544

INSPECTION PROCEDURE

1.CHECK CONNECTOR

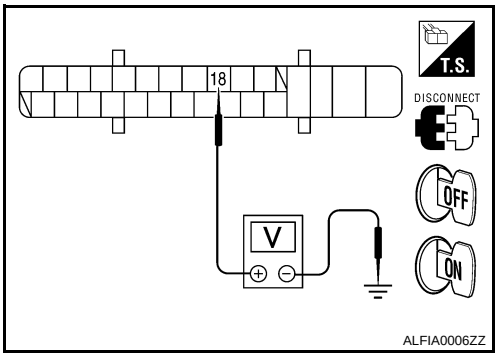
1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
2. Reconnect connector and perform self-diagnosis.

OK or NG

OK >> INSPECTION END
NG >> GO TO 2..

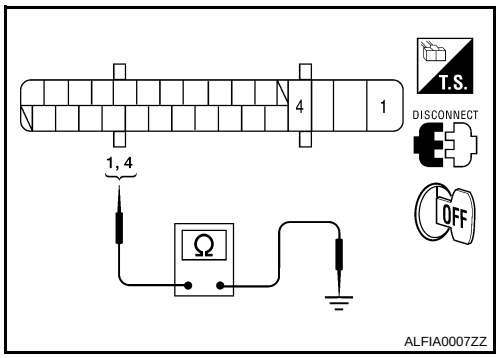
2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY CIRCUIT AND GROUND CIRCUIT

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.



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

OK or NG

OK >> • 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″.

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

DTC C1110 CONTROL FAILURE

DTC Logic

INFOID:0000000000992545

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 BRC-84, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992546

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

Description

INFOID:0000000000992547

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:0000000000992548

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-85, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992549

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.

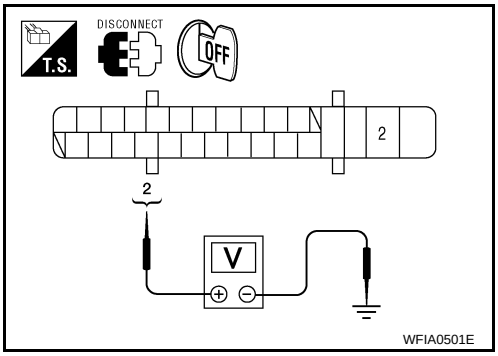
OK or NG

OK >> Inspection end.
NG >> GO TO 2..

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.

2. 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)

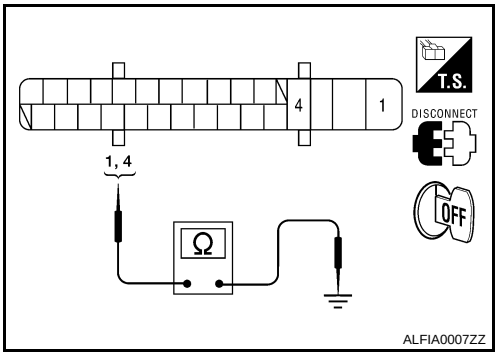
OK or NG

OK >> GO TO 3..

NG >> • 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

OK or NG

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

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

Component Inspection

INFOID:0000000000992550

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 BRC-85, "Diagnosis Procedure".

DTC C1114 MAIN RELAY

Description

INFOID:0000000000992551

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

DTC Logic

INFOID:0000000000992552

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 (control unit)
		During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open.	

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 BRC-87, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992553

INSPECTION PROCEDURE

1.CHECK CONNECTOR

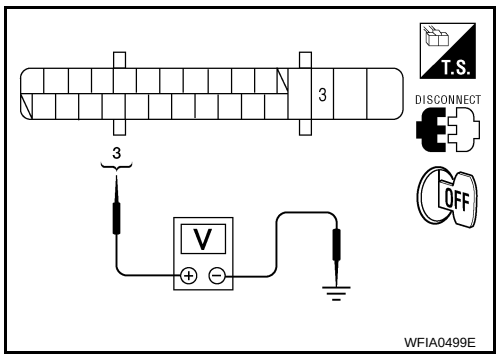
1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
2. Reconnect connector and perform self-diagnosis.

OK or NG

OK >> Inspection end.
NG >> 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.
2. Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.



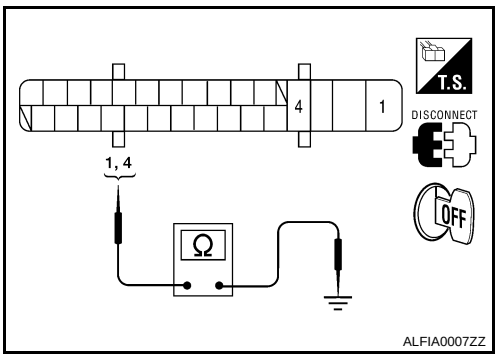
ABS actuator and electric unit (contorl unit)	Ground	Voltage
3	—	Battery voltage (Approx. 12 V)

OK or NG

OK >> GO TO 3..
NG >> • 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 (contorl unit)	Ground	Continuity
1, 4	—	Yes

OK or NG

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

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

Component Inspection

INFOID:0000000000992554

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 BRC-87, "Diagnosis Procedure".

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

Description

INFOID:0000000000992555

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:0000000000992556

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 BRC-89, "Diagnosis Procedure".
NO >> Inspection end.

Diagnosis Procedure

INFOID:0000000000992557

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.

OK or NG

OK >> GO TO 3..
NG >> • 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

1. 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.
2. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-71, "CONSULT-III Function (ABS)".

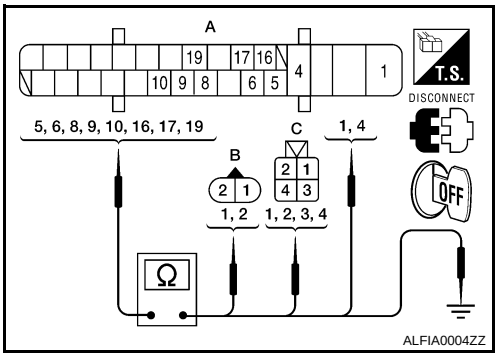
OK or NG

OK >> Inspection end.

NG >> GO TO 4..

4.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.)



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

OK or NG

OK >> GO TO 5..
NG >> • 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.
2. 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?

OK >> Inspection end.
NG >> • 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

INFOID:0000000000992558

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

Is the inspection result normal?

YES >> Inspection end.

NO >> Go to diagnosis procedure. Refer to BRC-89, "Diagnosis Procedure".

C1120, C1122, C1124, C1126 IN ABS SOL

Description

INFOID:0000000000992559

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:0000000000992560

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.	• ABS actuator and electric unit (control unit)
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH inlet solenoid circuit.	
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH inlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-92, "Diagnosis Procedure".
NO >> Inspection end.

Diagnosis Procedure

INFOID:0000000000992561

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.

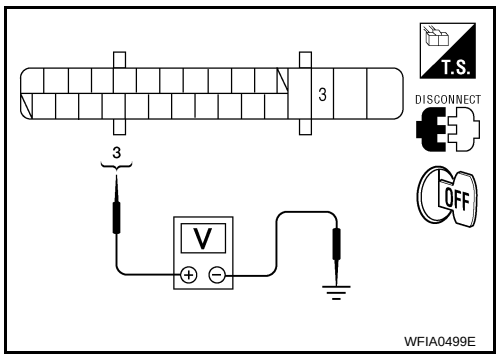
OK or NG

OK >> Inspection end.
NG >> 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.

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



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

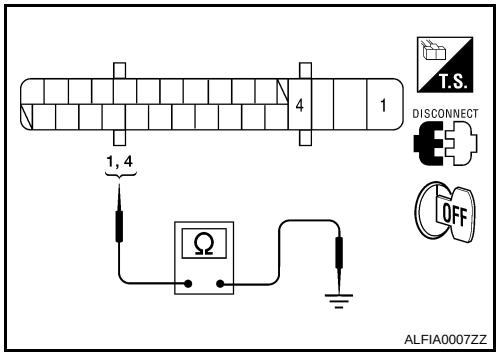
OK or NG

OK >> GO TO 3..

NG >> • 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 (contorl unit)	Ground	Continuity
1, 4	—	Yes

OK or NG

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

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

Component Inspection

INFOID:0000000000992562

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 BRC-92, "Diagnosis Procedure".

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

INFOID:0000000000992563

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:0000000000992564

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.	• ABS actuator and electric unit (control unit)
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-94, "Diagnosis Procedure".
NO >> Inspection end.

Diagnosis Procedure

INFOID:0000000000992565

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.

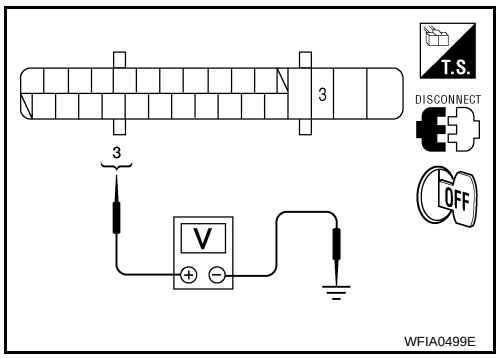
OK or NG

OK >> Inspection end.
NG >> 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.

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



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

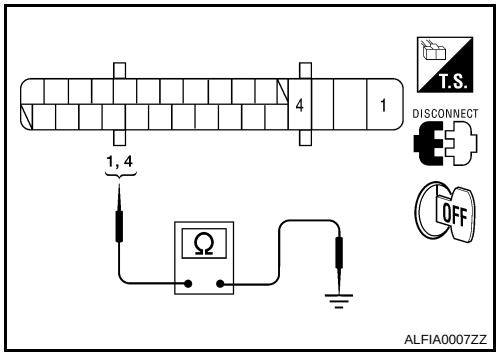
OK or NG

OK >> GO TO 3..

NG >> • 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 (contorl unit)	Ground	Continuity
1, 4	—	Yes

OK or NG

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

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

Component Inspection

INFOID:0000000000992566

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 BRC-94, "Diagnosis Procedure".

C1130, C1131, C1132, C1133 ENGINE SIGNAL

Description

INFOID:0000000000992567

DTC Logic

INFOID:0000000000992568

DTC DETECTION LOGIC

DTC Detection Logic

DTC CONFIRMATION PROCEDURE

DTC Confirmation Procedure

Diagnosis Procedure

INFOID:0000000000992569

INSPECTION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4

Is above displayed on the self-diagnosis display?

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

2.CHECK ENGINE SYSTEM

1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to EC-118, "Diagnosis Description" (VQ35DE), EC-1129, "Diagnosis Description" (QR25DE), or EC-619, "Diagnosis Description" (QR25DE CAL).
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

OK or NG

OK >> Inspection end.
NG >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection & Special Repair Requirement

INFOID:0000000000992570

COMPONENT INSPECTION

Component Inspection

SPECIAL REPAIR REQUIREMENT

Special Repair Requirement

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000000992571

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:0000000000992572

DTC DETECTION LOGIC

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

Diagnosis Procedure

INFOID:0000000000992573

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.

ABS WARNING LAMP

Description

INFOID:0000000000992574

×: 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:0000000000992575

1.CHECK ABS WARNING LAMP OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-98, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000000992576

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-71, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-16, "Diagnosis Description".

Is the inspection result normal?

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

BRAKE WARNING LAMP

Description

INFOID:0000000000992577

×: 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:0000000000992578

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 BRC-99, "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 BRC-185, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000000992579

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 MWI-28, "Diagnosis Procedure".

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 MWI-16, "Diagnosis Description".

Is the inspection result normal?

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

TCS OFF SWITCH

Description

INFOID:0000000000992580

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

Component Function Check

INFOID:0000000000992581

1.CHECK VDC 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.

Condition	TCS OFF indicator lamp illumination status
TCS OFF switch: ON	ON
TCS OFF switch: OFF	OFF

Is the inspection result normal?

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

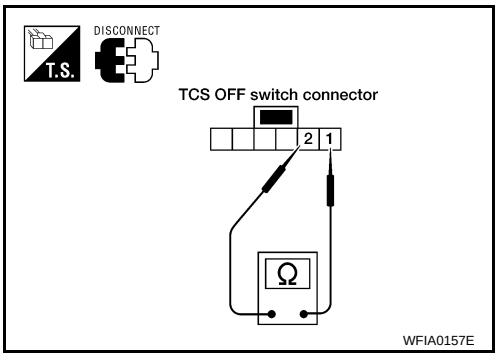
Diagnosis Procedure

INFOID:0000000000992582

INSPECTION PROCEDURE

1.CHECK TCS OFF SWITCH

1. Turn ignition switch OFF and disconnect TCS OFF switch connector M72.
2. Check continuity between TCS OFF switch connector M72 terminal 1 and 2.



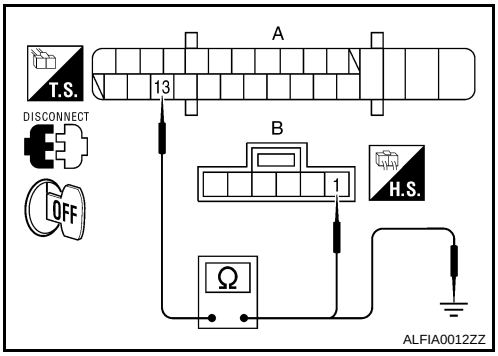
TCS OFF switch	Condition	Continuity
1, 2	TCS OFF switch ON	Yes
	TCS OFF switch OFF	No

OK or NG

OK >> GO TO 2..
NG >> TCS OFF switch is malfunctioning. Replace TCS OFF 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 unit) connector (A) E26 terminal 13 and TCS OFF switch connector M72 terminal 1.



ABS actuator and electric unit (control unit)	TCS OFF switch	Continuity
13	1	Yes

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

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

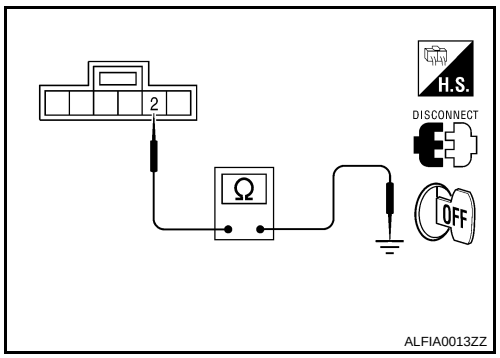
OK or NG

OK >> Inspection end.
NG >> 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



OK or NG

OK >> Inspection end.
NG >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000000992583

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.

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace TCS OFF switch.

ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000000992584

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	Wheel speed	0 [km/h]	Vehicle stopped
		Nearly matches the speed meter display (± 10 % or less)	Vehicle running (Note 1)
STOP LAMP SW	Brake pedal operation	When brake pedal is depressed	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 indicator lamp is ON)	ON
		TCS OFF switch OFF (When TCS OFF indicator lamp is OFF)	OFF
ENGINE RPM	With engine running	With engine stopped	0 rpm
		Engine running	Almost in accordance with tachometer display
FR RH IN SOL FR RH OUT SOL FR LH IN SOL FR LH OUT SOL RR RH IN SOL RR RH OUT SOL RR LH IN SOL RR LH OUT SOL	Operation status of all solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY (Note 2)	Actuator relay operation	When the actuator relay is operating	ON
		When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp (Note 3)	When ABS warning lamp is ON	ON
		When ABS warning lamp is OFF	OFF

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

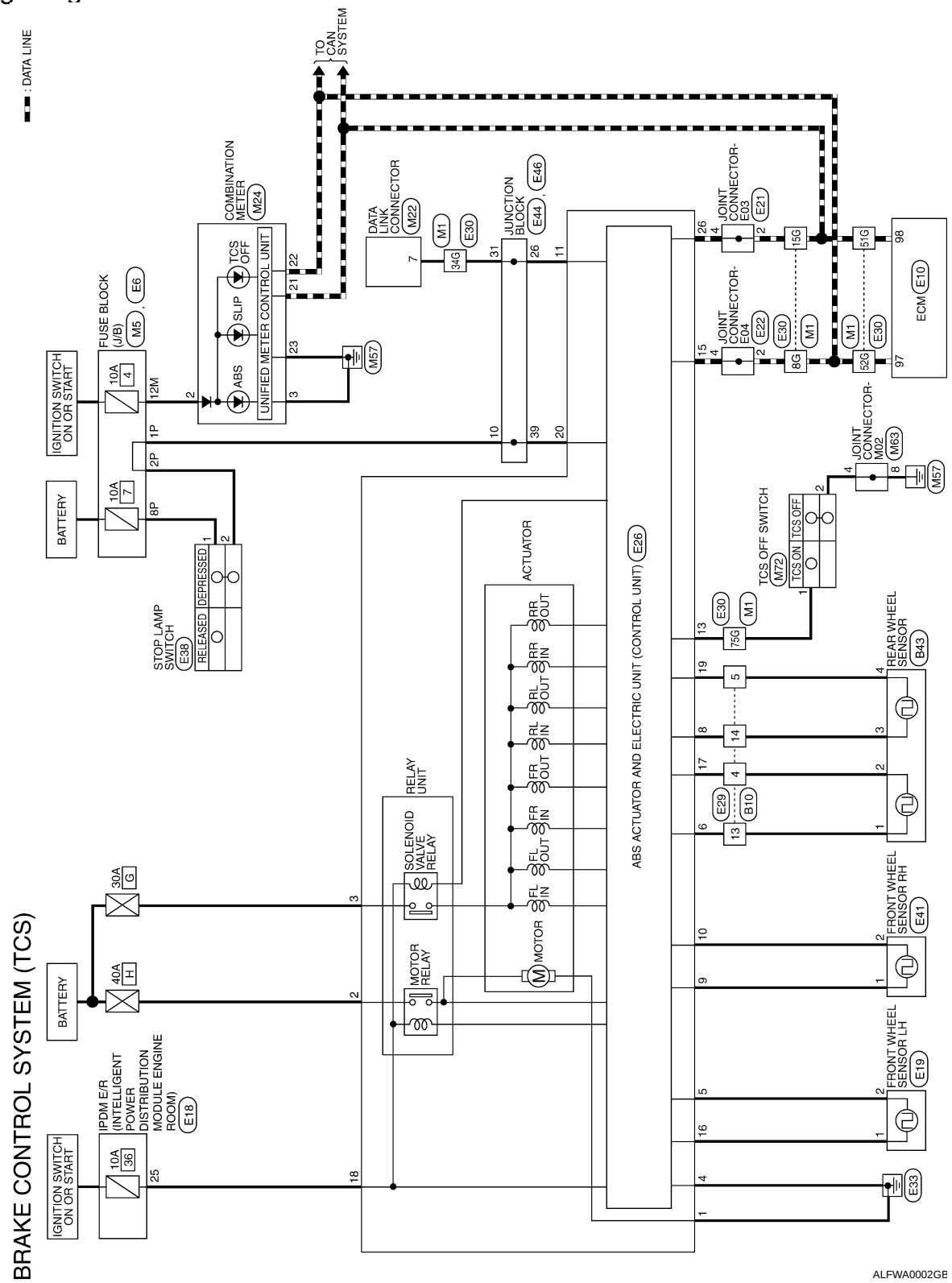
Note 1: Confirm tire pressure is normal.

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-71, "CONSULT-III Function (ABS)".

Wiring Diagram

INFOID:0000000000992585



BRAKE CONTROL SYSTEM (TCS) CONNECTORS

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
8G	P	–
15G	L	–
34G	O	–
51G	L	–
52G	P	–
75G	SB	–

Connector No.	M5
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
12M	P	–

Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
7	O	K-LINE

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
2	O	IGN
3	B	GND
21	L	CAN-H
22	P	CAN-L
23	B	GND

Connector No.	M63
Connector Name	JOINT CONNECTOR-M02
Connector Color	BLUE

H.S.

Terminal No.	Color of wire	Signal Name
4	B	–
8	B	–

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Connector No.	M72
Connector Name	TCS OFF SWITCH
Connector Color	GRAY

H.S.

6	5	4	3	2	1

Terminal No.	Color of wire	Signal Name
1	SB	–
2	B	–

Connector No.	E6
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.

7P	6P	5P	4P		3P	2P	1P
16P	15P	14P	13P	12P	11P	10P	9P	8P

Terminal No.	Color of wire	Signal Name
1P	SB	–
2P	R/G	–
8P	Y/R	–

Connector No.	E10
Connector Name	ECM
Connector Color	BLACK

H.S.

81	85	89	93	97	101	105	109
82	86	90	94	98	102	106	110
83	87	91	95	99	103	107	111
84	88	92	96	100	104	108	112

Terminal No.	Color of wire	Signal Name
97	P	CAN-L
98	L	CAN-H

Connector No.	E18
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

9	10	11	12	13	14
3	4	5	6	7	8

25	26	27	28	29	30	31	32	33	34
15	16	17	18	19	20	21	22	23	24

37	38
35	36

Terminal No.	Color of wire	Signal Name
25	GR	ABS_ECU

Connector No.	E19
Connector Name	FRONT WHEEL SENSOR LH
Connector Color	GRAY

H.S.

1	2

Terminal No.	Color of wire	Signal Name
1	G	–
2	R	–

Connector No.	E21
Connector Name	JOINT CONNECTOR-E03
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of wire	Signal Name
2	L	–
4	L	–

ALFIA0035GB

Terminal No.	Color of wire	Signal Name
5	R	DS FL
6	L/Y	DP RL
8	W/R	DP RR
9	B	DP FR
10	W	DS FR
11	O	DIAG-K
13	SB	ASR AUS (TCS)
15	P	CAN-L
16	G	DP FL
17	R/W	DS RL
18	GR/R	UZ
19	B/R	DS RR
20	P/B	BLS
26	L	CAN-H

Connector No.	E26
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color	BLACK

H.S.

Terminal No.	Color of wire	Signal Name
1	B	MGND
2	G/R	UB (MR)
3	R/B	UB (VR)
4	B	GND

Terminal No.	Color of wire	Signal Name
8G	P	–
15G	L	–
34G	O	–
51G	L	–
52G	P	–
75G	SB	–

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Connector No.	E22
Connector Name	JOINT CONNECTOR-E04
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
2	P	–
4	P	–

Connector No.	E29
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
4	R/W	–
5	B/R	–
13	L/Y	–
14	W/R	–

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Connector No.	E38
Connector Name	STOP LAMP SWITCH (WITH CVT)
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
1	Y/R	–
2	R/G	–
3	G/R	–
4	R/W	–

Connector No.	E38
Connector Name	STOP LAMP SWITCH (WITH M/T)
Connector Color	BLACK

H.S.

Terminal No.	Color of wire	Signal Name
1	Y/R	–
2	R/G	–

Connector No.	E41
Connector Name	FRONT WHEEL SENSOR RH
Connector Color	GRAY

H.S.

Terminal No.	Color of wire	Signal Name
1	B	–
2	W	–

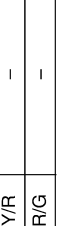
Connector No.	E44
Connector Name	JUNCTION BLOCK
Connector Color	BROWN

H.S.

Terminal No.	Color of wire	Signal Name
10	SB	–

Connector No.	E46
Connector Name	JUNCTION BLOCK
Connector Color	WHITE

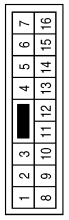
H.S.



Terminal No.	Color of wire	Signal Name
26	O	–
31	O	–
39	P/B	–

Connector No.	B10
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



Terminal No.	Color of wire	Signal Name
4	R/W	–
5	B/R	–
13	L/Y	–
14	W/R	–

ALFIA0037GB

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

Terminal No.	Color of wire	Signal Name
1	L/Y	POWER_LH
2	R/W	SIG_LH
3	W/R	POWER_RH
4	B/R	SIG_RH

ALFIA0038GB

Fail-Safe

INFOID:0000000000992586

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.

- 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:0000000000992587

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.	BRC-76, "Diagnosis Procedure" (Note)
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.	
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 distance 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-82, "Diagnosis Procedure"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-84, "Diagnosis Procedure"
PUMP MOTOR [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.	BRC-85, "Diagnosis Procedure"
	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	
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-87, "Diagnosis Procedure"
ABS SENSOR [C1115]	Teeth damage on sensor rotor or improper installation of wheel sensor.	BRC-89, "Diagnosis Procedure"
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-92, "Diagnosis Procedure"
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-94, "Diagnosis Procedure"
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-92, "Diagnosis Procedure"

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-94, "Diagnosis Procedure"
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	BRC-92, "Diagnosis Procedure"
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-94, "Diagnosis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-92, "Diagnosis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-94, "Diagnosis Procedure"
ENGINE SIGNAL 1 [C1130]	Fuel cut control abnormal.	BRC-96, "Diagnosis Procedure"
ENGINE SIGNAL 2 [C1131]	Electric throttle control abnormal.	
ENGINE SIGNAL 3 [C1132]	ECM CAN communication abnormal.	
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-97, "Diagnosis 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.

SYMPTOM DIAGNOSIS

TCS

Symptom Table

INFOID:0000000000992588

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

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-113, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-114, "Diagnosis Procedure"
	Make sure the braking force is sufficient when the ABS is not operating.	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-115, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-116, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-117, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-118, "Diagnosis Procedure"
	ECM	

NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (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

Diagnosis Procedure

INFOID:0000000000992589

1.CHECK START

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

OK or NG

OK >> GO TO 2..
NG >> 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: FAX-5, "Inspection", Rear: RAX-5, "On-vehicle Service".

OK or NG

OK >> GO TO 3..
NG >> 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.

OK or NG

OK >> GO TO 4..
NG >> • 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.

OK or NG

OK >> System normal.
NG >> Perform self-diagnosis. Refer to BRC-12, "CONSULT-III Function (ABS)".

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000000992590

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-12, "Inspection and Adjustment".

Is the stroke too big?

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

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.

OK or NG

OK >> GO TO procedure 3 “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom 1. Refer to BRC-49, "Diagnosis Procedure".

NG >> Check brake system.

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000000992591

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.

OK or NG

OK >> GO TO procedure 3 “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom 1. Refer to BRC-49, "Diagnosis Procedure".

NG >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000000992592

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.

OK or NG

OK >> GO TO procedure 3 “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom 1. Refer to BRC-49, "Diagnosis Procedure".

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

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000000992593

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 BRC-71, "CONSULT-III Function (ABS)".

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-12, "CONSULT-III Function (ABS)".

VEHICLE JERKS DURING TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000000992594

1.SYMPTOM CHECK

Check if the vehicle jerks during TCS/ABS control.

OK or NG

OK >> Normal.
NG >> 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-130, "CONSULT-III Function" (VQ35DE), EC-1141, "CONSULT-III Function" (QR25DE FED) or EC-632, "CONSULT-III Function" (QR25DE CAL).
- CVT: Refer to TM-110, "Diagnosis Description" (RE0F09B) or TM-264, "Diagnosis Description" (RE0F10A).

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

NORMAL OPERATING CONDITION

Description

INFOID:0000000000992595

Symptom	Result
Slight vibrations are felt on the brake pedal and the operation noises occur, when TCS or ABS is activated.	This is a normal condition due to the TCS or ABS activation.
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	
The brake pedal 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.
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because TCS places the highest priority on the optimum traction (stability).
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	
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 condition is restored, there is no malfunction. At that time, erase the self-diagnosis memory.
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).	
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 inspection on a chassis dynamometer.)
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 system error but results from characteristic change of tire.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000000992596

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 SRS and SB section of this Service Manual.

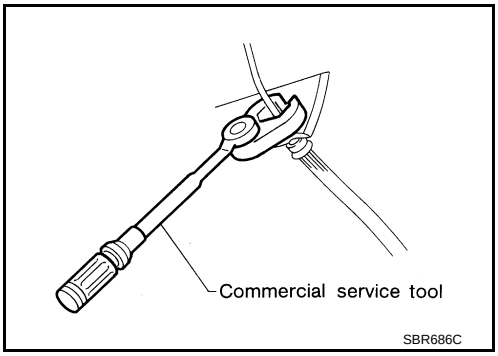
WARNING:

- **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 SRS 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

INFOID:0000000000992597

- 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:0000000000992598

- 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: Suspension-related parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related

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

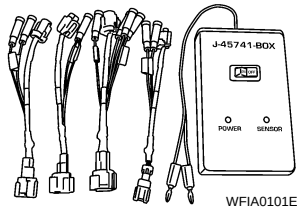
PREPARATION

PREPARATION

Special Service Tool

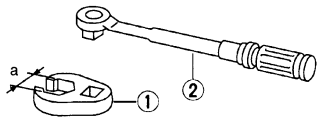
INFOID:0000000000992599

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  WFIA0101E	Checking operation of ABS active wheel sensor

Commercial Service Tool

INFOID:0000000000992600

Tool name	Description
1. Flare nut crowfoot 2. Torque wrench  S-NT360	Removing and installing brake piping **a: 10mm (0.39 in)/12mm (0.47 in)**

ON-VEHICLE REPAIR

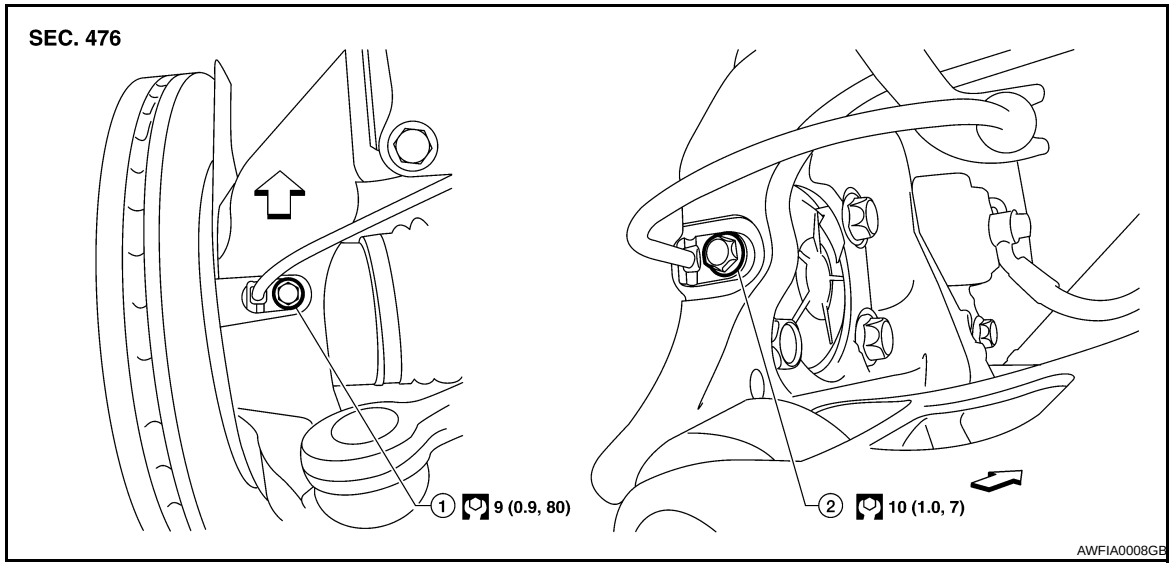
WHEEL SENSORS

Exploded View

INFOID:0000000000992601

Removal and Installation

INFOID:0000000000992602



1. Front wheel sensor
2. Rear wheel sensor
⇐ Front

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 mounting 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 mounting the wheel sensor, or if a foreign object is caught in the surface of the mounting for the rotor. If something wrong is found, fix it and then install the wheel sensor.**

REMOVAL

Front

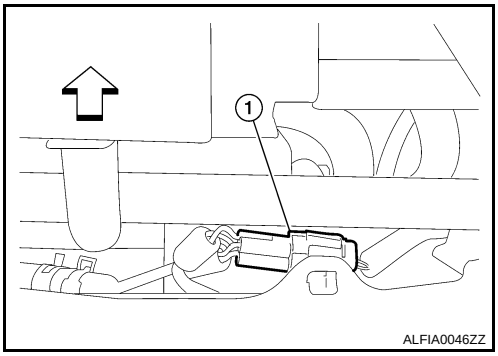
1. Remove wheel and tire using power tool.
2. Partially front wheel fender protector. Refer to EXT-18, "Removal and Installation".
3. Remove wheel sensor bolt and wheel sensor.
4. Remove harness wire from mounts and disconnect wheel sensor harness connector.

Rear

NOTE:
Both 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.
3. Remove harness wire from mounts and harness wire clips from suspension member.

4. Disconnect wheel sensor harness connector (1).



INSTALLATION

Installation is in the reverse order of removal.

- When installing wheel and tire, refer to WT-33, "Adjustment".

SENSOR ROTOR

Removal and Installation

INFOID:0000000000992603

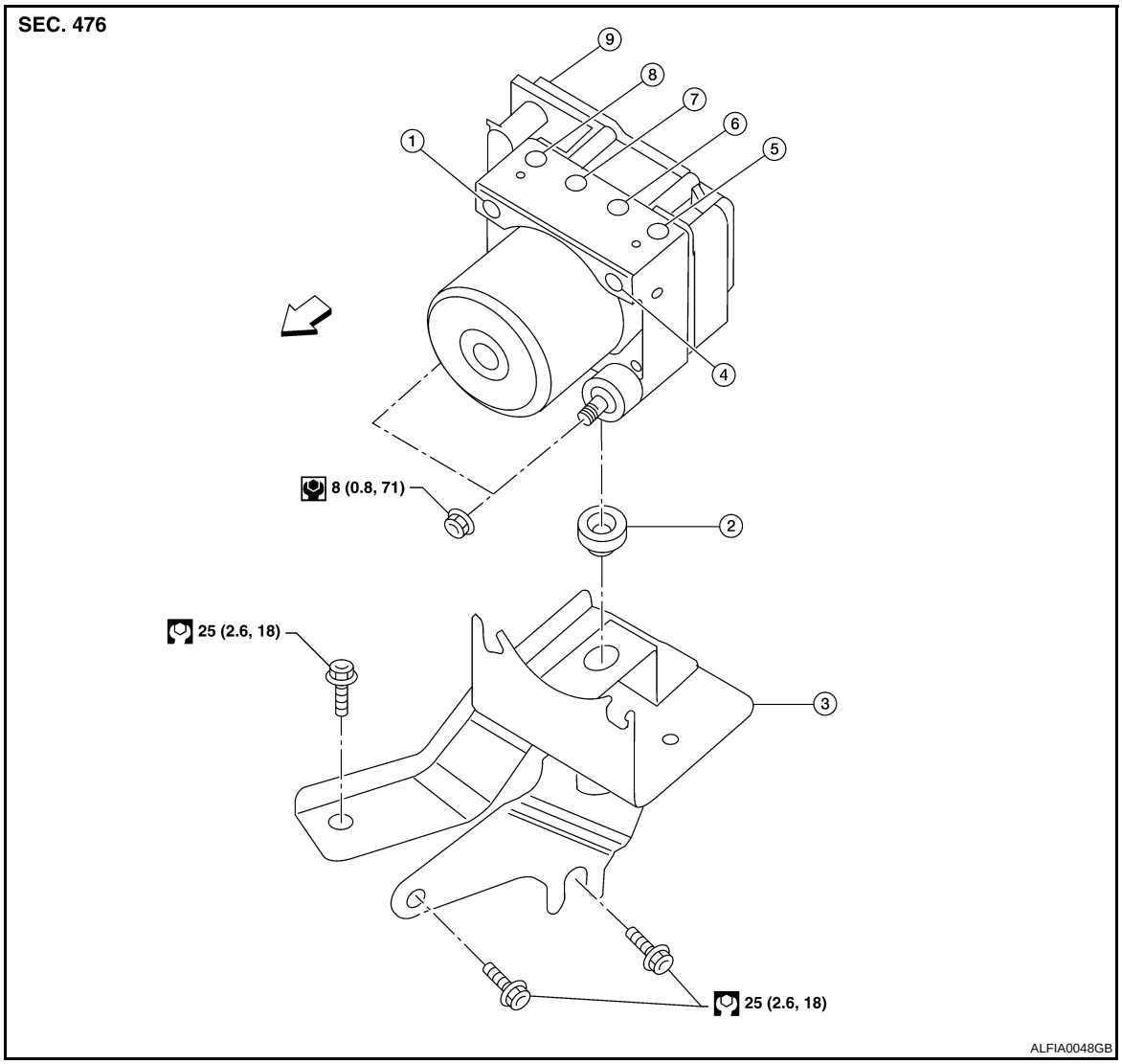
The front and rear wheel sensor rotors are an integral part of the wheel hub assemblies and can not be disassembled. When replacing the sensor rotor, replace the wheel hub assembly. Refer to FAX-7, "Removal and Installation" (Front), RAX-6, "Removal and Installation" (Rear).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:0000000000992604

COMPONENT



1.	From master cylinder secondary side	2.	Grommet	3.	Bracket
4.	From master cylinder primary side	5.	To front LH brake caliper	6.	To rear RH brake caliper
7.	To rear LH brake caliper	8.	To front RH brake caliper	9.	ABS actuator and electric unit
⇐	Front				

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

Removal and Installation

INFOID:0000000000992605

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".**

1. Remove front wiper arms. Refer to WW-35, "FRONT WIPER ARMS : Removal and Installation".
2. Remove cowl top. Refer to EXT-17, "Removal and Installation".
3. Disconnect washer hose.
4. Remove tower bar, if equipped. Refer to FSU-13, "Exploded View".
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.

INSTALLATION

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".**
- **After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked.**

Installation is the reverse order of removal.

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000000992606

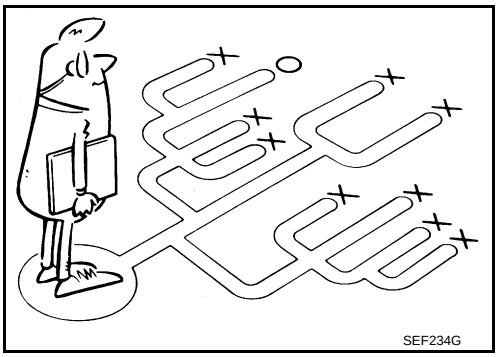
PRECAUTIONS FOR DIAGNOSIS

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-132, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

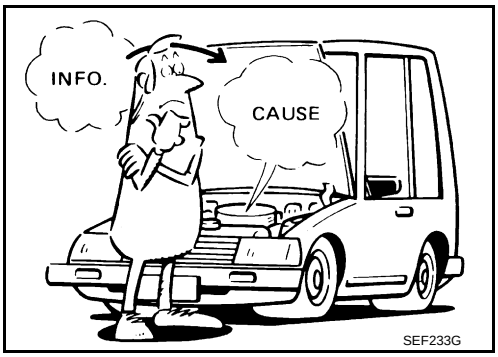
DESCRIPTION

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”.


SEF234G

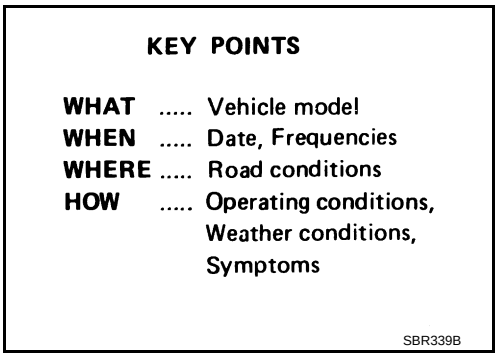
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are 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-138, "CONSULT-III Function (ABS)".
- Always read “GI General Information” to confirm general precautions. Refer to Refer to Service Manual.



SEF233G

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.



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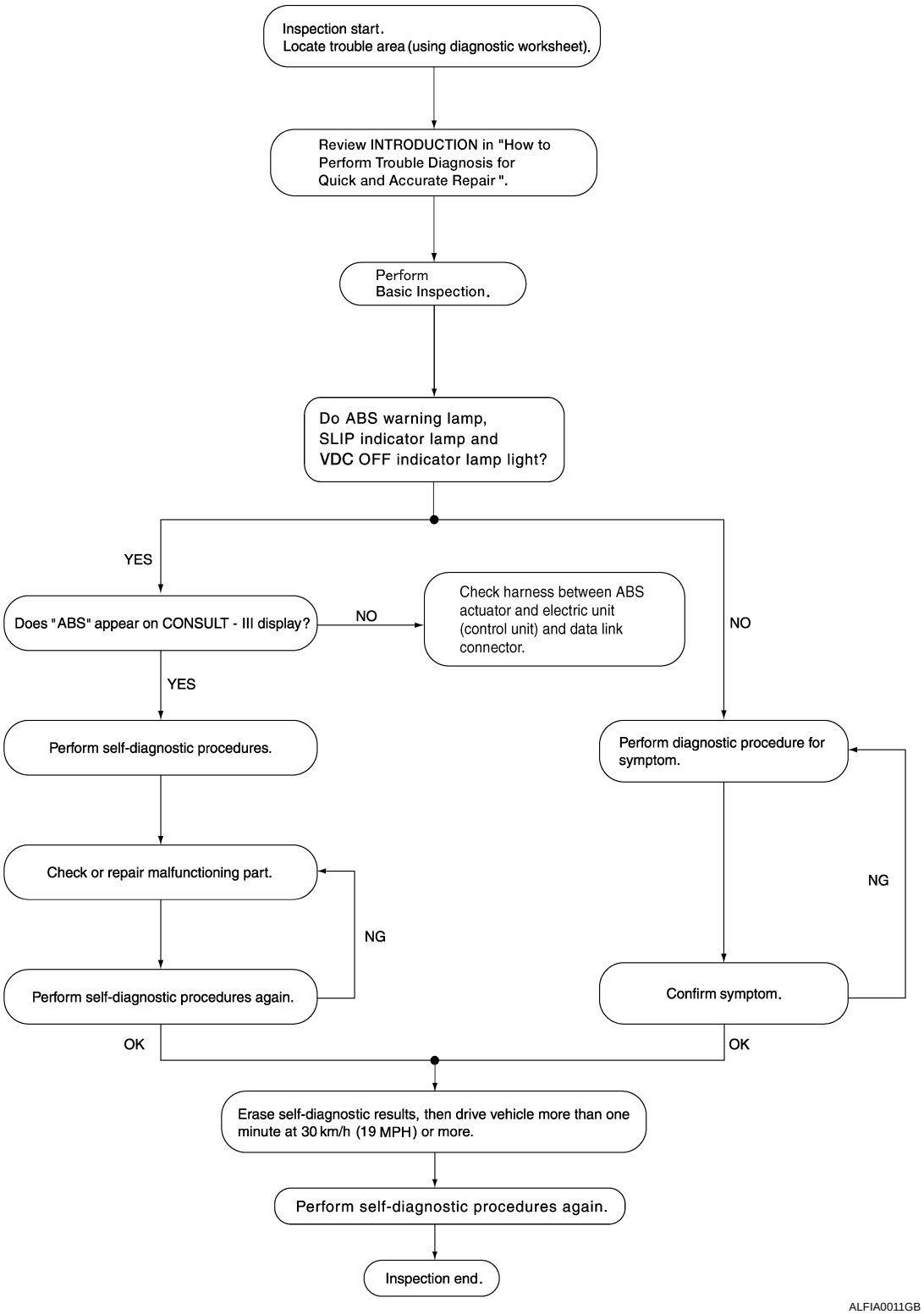
OVERALL SEQUENCE



DETAILED FLOW

1. COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to BRC-131, "Diagnostic Work Sheet".

>> GO TO 2.

2.PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function. Refer to BRC-138, "CONSULT-III Function (ABS)".

Is there any DTC displayed?

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

3.PERFORM THE SYSTEM DIAGNOSIS

Perform the diagnosis applicable to the displayed DTC. Refer to BRC-204, "DTC No. Index".

>> GO TO 7.

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

Check that the symptom is a normal operation that is not considered a system malfunction. Refer to BRC-138, "CONSULT-III Function (ABS)".

Is the symptom is a normal operation?

YES >> INSPECTION END
NO >> GO TO 5.

5.CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.
- ABS warning lamp: Refer to BRC-189, "Description".
- Brake warning lamp: Refer to BRC-190, "Description".
- VDC OFF indicator lamp: Refer to BRC-191, "Description".
- SLIP indicator lamp: Refer to BRC-192, "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-138, "CONSULT-III Function (ABS)".

Is no other DTC present and the repair completed?

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

Diagnostic Work Sheet

INFOID:0000000000992607

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

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INSPECTION AND ADJUSTMENT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

INFOID:0000000000992608

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

INFOID:0000000000992609

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to BRC-132, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:0000000000992610

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

×: 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

INFOID:0000000000992611

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

CAUTION:

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

1.ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

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

1. On the CONSULT-III screen, touch "WORK SUPPORT", then "ST ANG SEN ADJUSTMENT".
2. Touch “START”.
   CAUTION:
   Do not touch steering wheel while adjusting steering angle sensor.
3. After approximately 10 seconds, touch “END”.
   NOTE:
   After approximately 60 seconds, the adjustment ends automatically.
4. Turn ignition switch OFF, then turn it ON again.
   CAUTION:
   Be sure to perform above operation.

>> GO TO 3.

3.CHECK DATA MONITOR

1. Run vehicle with front wheels in straight-ahead position, then stop.
2. Select “DATA MONITOR”. Then make sure “STR ANGLE SIG” is within 0±2.5°.

Is the steering angle within the specified range?

YES >> GO TO 4.
NO >> Perform the neutral position adjustment for the steering angle sensor again, GO TO 1.

4.ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memories of the ABS actuator and electric unit (control unit) and ECM.
- ABS actuator and electric unit (control unit): Refer to BRC-138, "CONSULT-III Function (ABS)".
- ECM: Refer to BRC-138, "CONSULT-III Function (ABS)".

Are the memories erased?

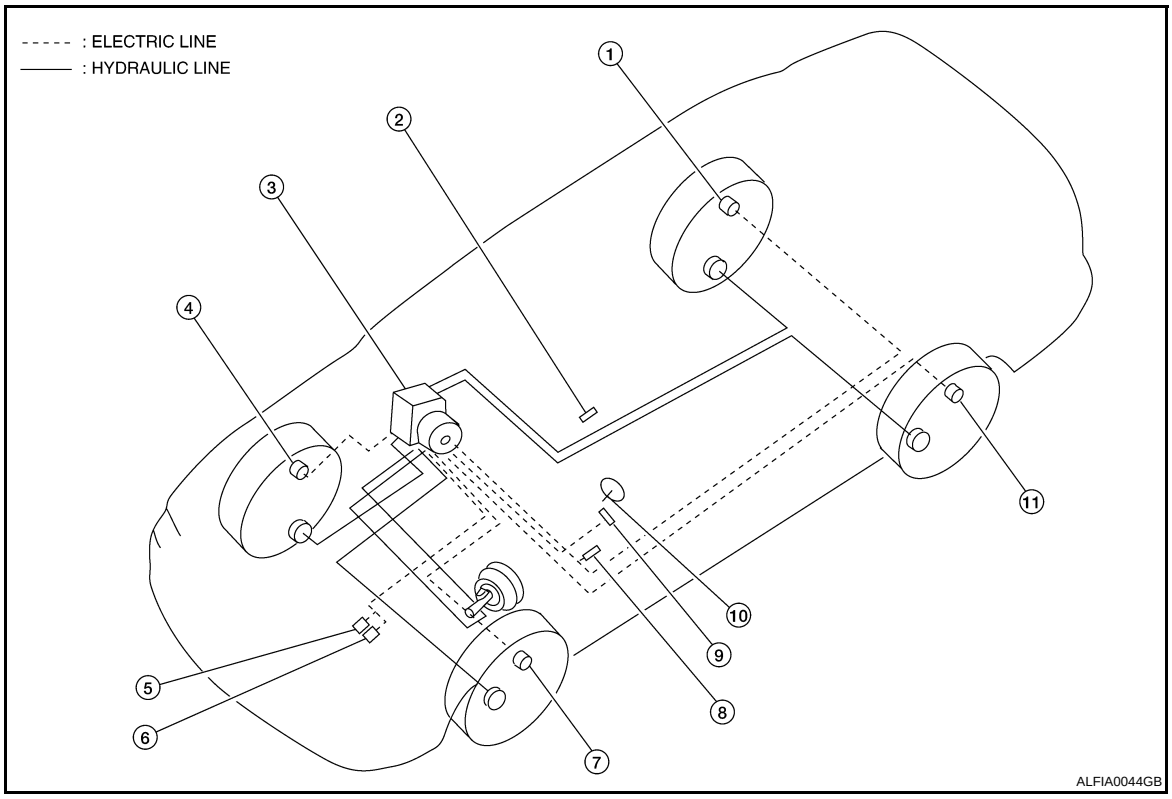
YES >> INSPECTION END
NO >> Check the items indicated by the self-diagnosis.

FUNCTION DIAGNOSIS

VDC/TCS/ABS

System Diagram

INFOID:0000000000992612



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

System Description

INFOID:0000000000992613

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.

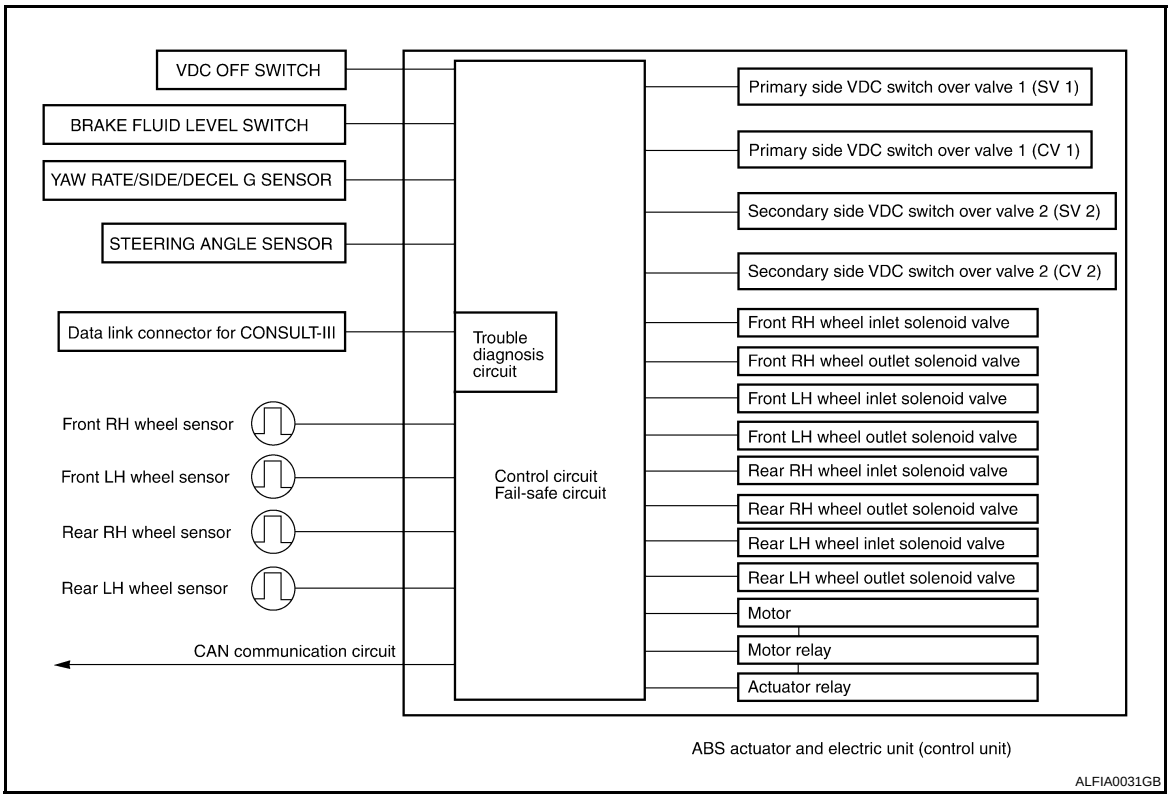
VDC / TCS

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.

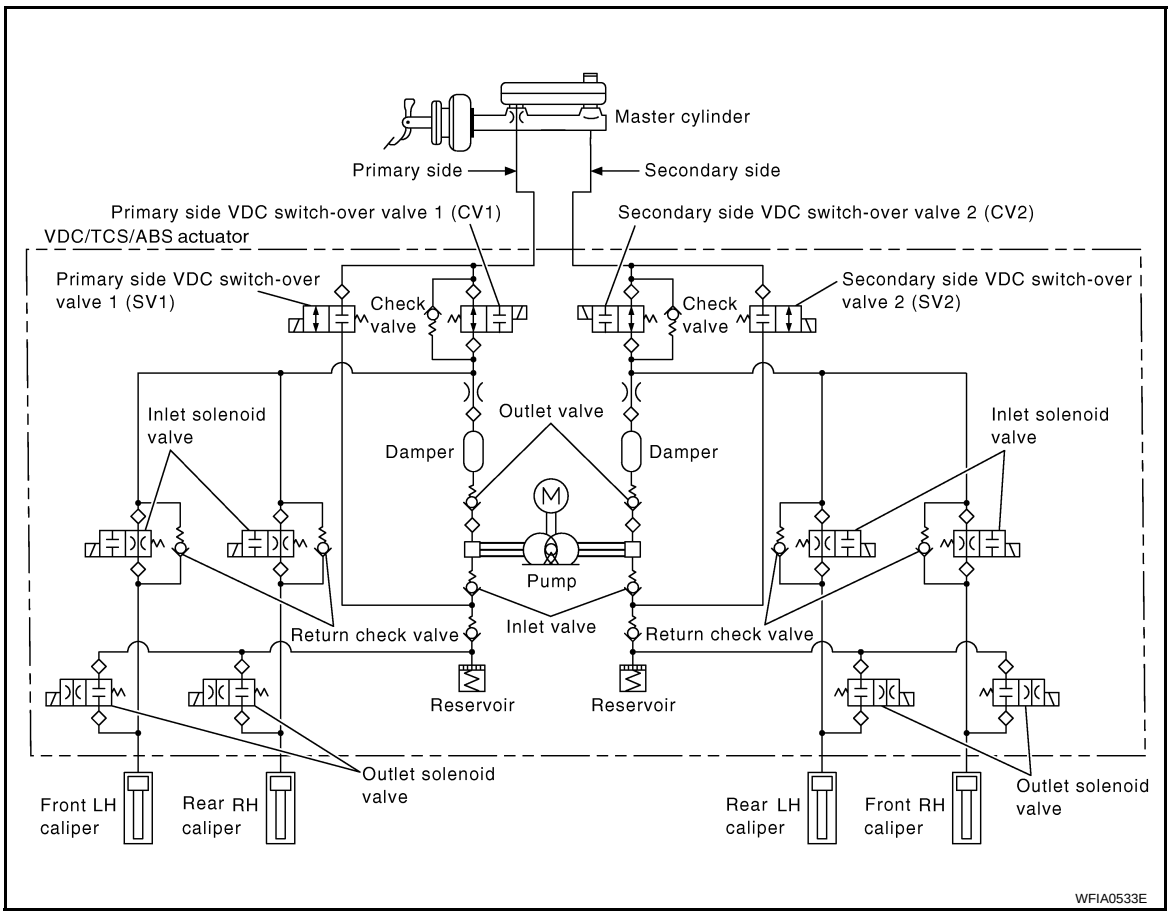
CAUTION:

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

ELECTRICAL COMPONENTS



VDC / TCS



OPERATION THAT IS NOT "SYSTEM ERROR"

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.

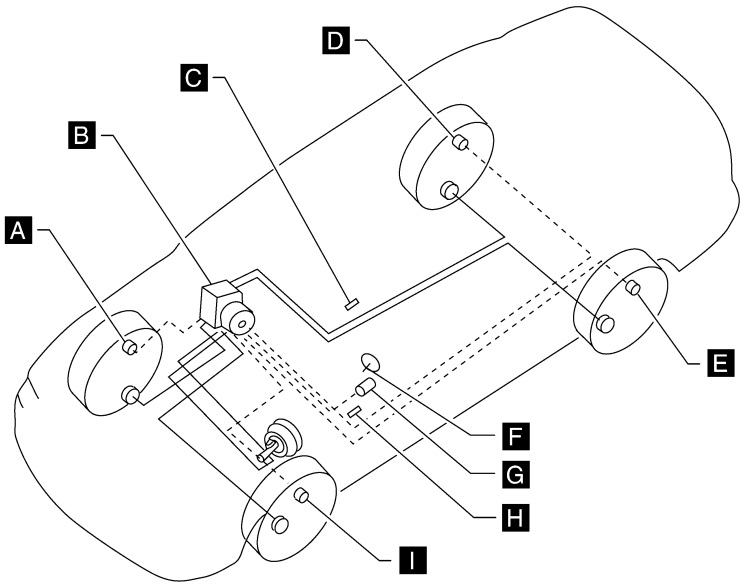
TCS
- Depending on road circumstances, driver may have a sluggish feel. This is normal, because optimum traction has highest priority under TCS operation.
- When vehicle is passing through a road where surface friction varies, downshifting or depressing accelerator pedal fully may activate TCS temporarily.

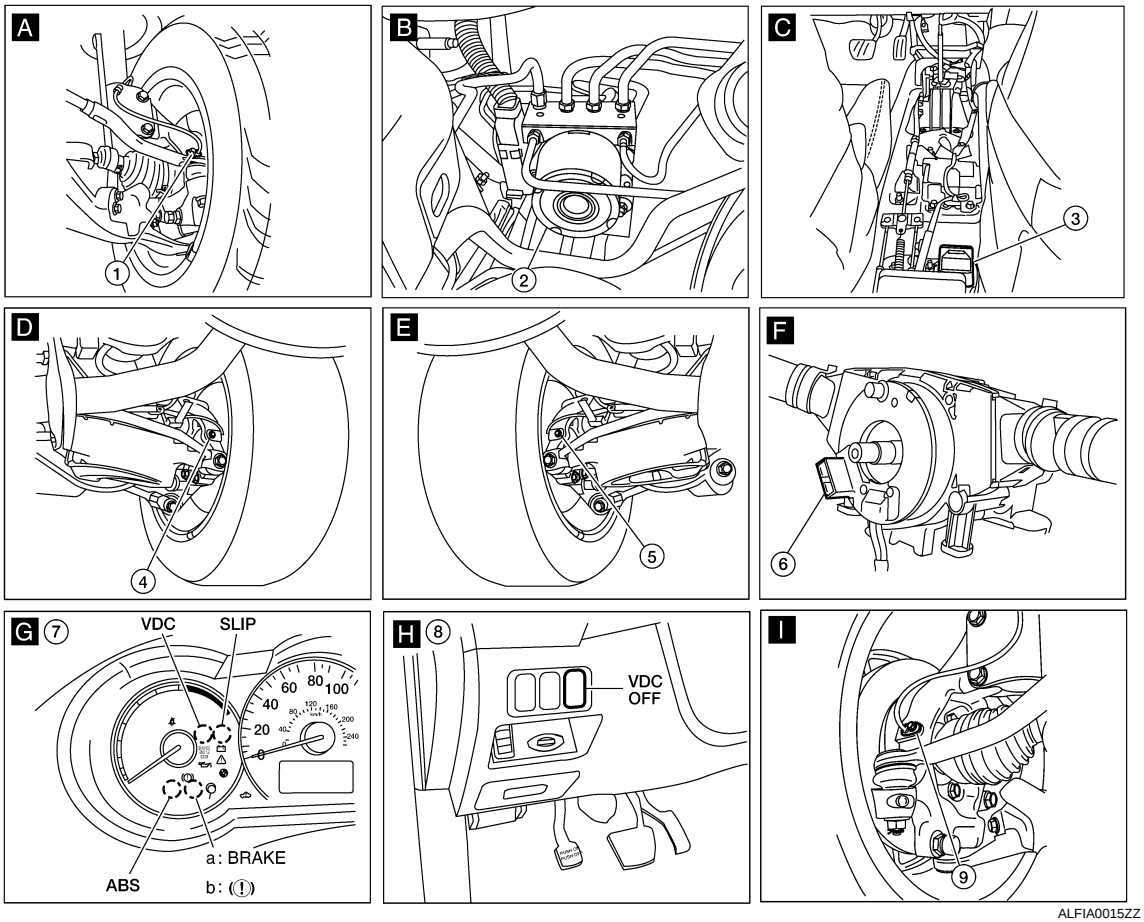
VDC
- During VDC operation, body and brake pedal lightly vibrate and mechanical sounds may be heard. This is normal.
- If vehicle is rotated on turn table, or rolled and rocked on ship, ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp may turn on. In this case, start engine on normal 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 BRC-138, "CONSULT-III Function (ABS)".
- 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 BRC-138, "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".

Component Parts Location

INFOID:0000000000992614





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1. Front wheel sensor RH
2. ABS actuator and electric unit (control unit)
3. Yaw rate/side/decel G sensor
4. Rear wheel sensor RH
5. Rear wheel sensor LH
6. Spiral cable (includes steering angle sensor) (Steering wheel removed for clarity)
7. Warning indicator lamps
8. VDC OFF switch
9. Front wheel sensor LH

Component Description

INFOID:0000000000992615

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-154, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-156, "Description"
	Solenoid valve	BRC-163, "Description"
	Pressure sensor	BRC-169, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-187, "Description"
Wheel sensor		BRC-145, "Description"
Yaw rate/side G sensor		BRC-173, "Description"
Steering angle sensor		BRC-171, "Description"
VDC OFF switch		BRC-187, "Description"
ABS warning lamp		BRC-189, "Description"
Brake warning lamp		BRC-190, "Description"
Parking brake switch		BRC-185, "Description"
VDC OFF indicator lamp		BRC-191, "Description"
SLIP indicator lamp		BRC-192, "Description"

CONSULT-III Function (ABS)

INFOID:0000000000992616

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

CAUTION:

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

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”.
3. Touch “START”.
   CAUTION:
   Do not touch steering wheel while adjusting steering angle sensor.

4. After approximately 10 seconds, touch “END”. (After approximately 60 seconds, it ends automatically.)
5. Turn ignition switch OFF, then turn it ON again.
   CAUTION:
   Be sure to perform above operation.
6. Run vehicle with front wheels in straight-ahead position, then stop.
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.
8. Erase memory of ABS actuator and electric unit (control unit) and ECM. ABS actuator and electric unit (control unit): Refer to BRC-138, "CONSULT-III Function (ABS)". ECM: Refer to EC-20, "Work Flow" (VQ35DE), EC-528, "Work Flow" (QR25DE California), EC-1043, "Work Flow" (QR25DE non-California).
9. Turn ignition switch OFF.

SELF-DIAGNOSIS RESULTS

Operation Procedure

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 “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS” in order on the CONSULT-III screen.
   CAUTION:
   If “START (NISSAN BASED VHCL)” is touched immediately after starting engine or turning on the ignition switch, “ABS” might not be displayed in the “SELECT SYSTEM” screen. In this case, repeat the operation from step 1.
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 BRC-207, "Symptom Table".
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.
   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.

Erase Memory

1. Turn ignition switch OFF.
2. Start engine and touch “START (NISSAN BASED VHCL)”, “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-47, "Description".
   CAUTION:
   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.
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.

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).
- VDC OFF switch should not stay "ON" position.

Display Item List

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.	BRC-145, "Description" (Note 1)
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.	
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 distance 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-151, "Description"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-153, "Diagnosis Procedure"
PUMP MOTOR [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.	BRC-154, "Description"
	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	
MAIN RELAY [C1114]	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-156, "Description"
	During the actuator relay operating with ON, when the actuator relay turns OFF, or when the control line for the relay is open.	
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input signal is malfunctioning.	BRC-158, "Description" (Note 1)
STOP LAMP SW [C1116]	When stop lamp switch circuit is open.	BRC-161, "Description"

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.	BRC-163, "Description"
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	
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.	
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	
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.	
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	
ENGINE SIGNAL 1 [C1130]	Major engine components are malfunctioning.	BRC-167, "Description"
ENGINE SIGNAL 2 [C1131]		
ENGINE SIGNAL 3 [C1132]		
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-169, "Description"
ST ANG SEN CIRCUIT [C1143]	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	BRC-171, "Description"
ST ANG SEN SIGNAL [C1144]	Neutral position correction of steering angle sensor is not finished.	
YAW RATE SENSOR [C1145]	Yaw rate sensor is malfunctioning, or the yaw rate sensor signal line is open or shorted.	BRC-173, "Description"
SIDE G-SEN CIRCUIT [C1146]	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	
USV LINE [FL-RR] [C1147]	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.	BRC-176, "Description"
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.	
HSV LINE [FL-RR] [C1149]	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.	
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.	
PNP POS SIG [C1154]	TCM or ABS actuator and electric unit (control unit) internal malfunction.	BRC-179, "Description"
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-180, "Description"
ST ANG SEN COM CIR [C1156]	CAN communication circuit or steering angle sensor is malfunctioning.	BRC-183, "Description"
CAN COMM CIRCUIT [U1000]	When there is a malfunction in the CAN communication circuit.	BRC-184, "Description" (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 toLAN-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 (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
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 (control 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 communication 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.

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 communication 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

–: 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, 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 (Note)	ABS solenoid valve			ABS solenoid valve (ACT)		
	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.

COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:0000000000992617

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:0000000000992618

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.	• Harness or connector • Wheel sensor • ABS actuator and electric unit (control unit)
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
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 CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-145, "Diagnosis Procedure".
NO >> INSPECTION END

DTC Confirmation Procedure

Diagnosis Procedure

INFOID:0000000000992619

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.

OK or NG

OK >> GO TO 2.
NG >> 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.

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 BRC-217, "Removal and Installation".

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

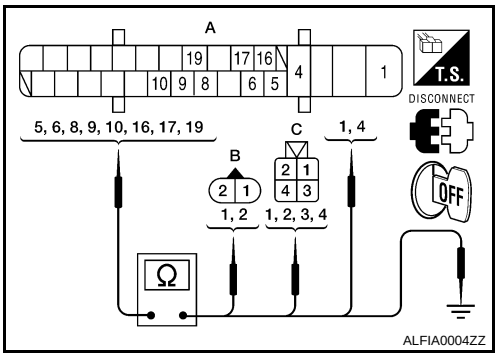
Check wheel bearing axial end play. Refer to FAX-5, "Inspection" (front) or RAX-5, "On-vehicle Service" (rear).

OK or NG

OK >> GO TO 5..
NG >> Repair or replace as necessary. Refer to FAX-7, "Removal and Installation" (front) or RAX-8, "Wheel Bearing (Rear)" (rear).

5.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.)



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

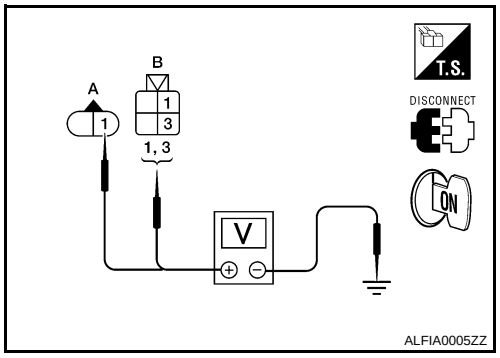
OK or NG

OK >> GO TO 6..
NG >> • Repair or replace malfunctioning components.

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

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)	1	—	8 V or more
Front LH (A)			
Rear LH (B)			
Rear RH (B)	3		

OK or NG

OK >> Inspection end.
NG >> Replace ABS actuator and electric unit (control unit).

Component Inspection

INFOID:0000000000992620

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-145, "Diagnosis Procedure".

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

INFOID:0000000000992621

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:0000000000992622

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.	• 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.	
C1107	FR RH SENSOR-2	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
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 BRC-148, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992623

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.

OK or NG

OK >> GO TO 2.
NG >> 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.

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 BRC-217, "Removal and Installation".

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

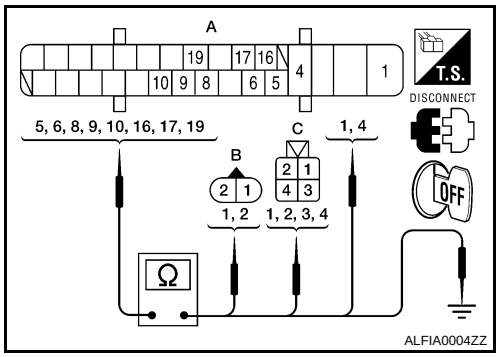
Check wheel bearing axial end play. Refer to FAX-5, "Inspection" (front) or RAX-5, "On-vehicle Service" (rear).

OK or NG

OK >> GO TO 5..
NG >> Repair or replace as necessary. Refer to FAX-7, "Removal and Installation" (front) or RAX-8, "Wheel Bearing (Rear)" (rear).

5.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.)



	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

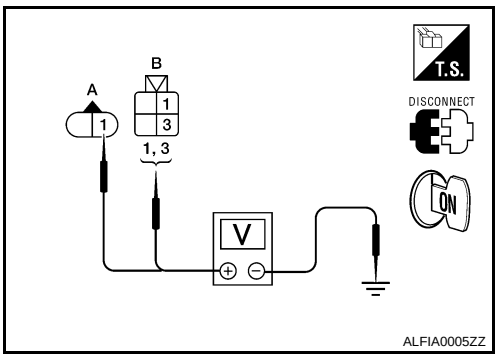
Power supply circuit : Continuity should exist.
Signal circuit : Continuity should exist.
Ground circuit : Continuity should not exist.

OK or NG

OK >> GO TO 6..
NG >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows “NO DTC IS DETECTED”.

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)	1	—	8 V or more
Front LH (A)			
Rear LH (B)			
Rear RH (B)	3		

OK or NG

OK >> Inspection end.
NG >> Replace ABS actuator and electric unit (control unit).

Component Inspection

INFOID:0000000000992624

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-148, "Diagnosis Procedure".

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

Description

INFOID:0000000000992625

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

DTC Logic

INFOID:0000000000992626

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-151, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992627

INSPECTION PROCEDURE

1.CHECK CONNECTOR

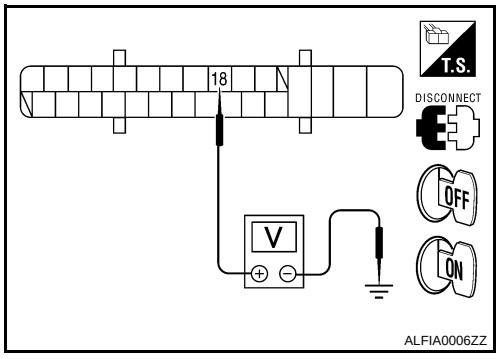
1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
2. Reconnect connector and perform self-diagnosis.

OK or NG

OK >> INSPECTION END
NG >> GO TO 2..

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

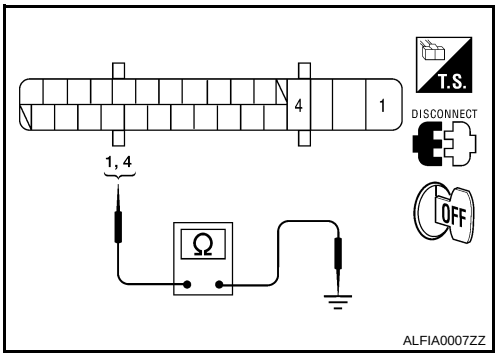
1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26.
2. Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 18 and ground.



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



OK or NG

OK >> • 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″.

NG >> • 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)

DTC Logic

INFOID:0000000000992628

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)
C1153	EMERGENCY BRAKE	When ABS actuator and electric unit (control unit) is malfunctioning. (Pressure increase is too much or too little)	
C1170	VARIANT CODING	In a case where VARIANT CODING is different.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE
EMERGENCY BRAKE
VARIANT CODING

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-153, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992629

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)..

Special Repair Requirement

INFOID:0000000000992630

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 BRC-223, "Removal and Installation".

>> END

DTC C1111 PUMP MOTOR

Description

INFOID:0000000000992631

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:0000000000992632

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-154, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992633

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.

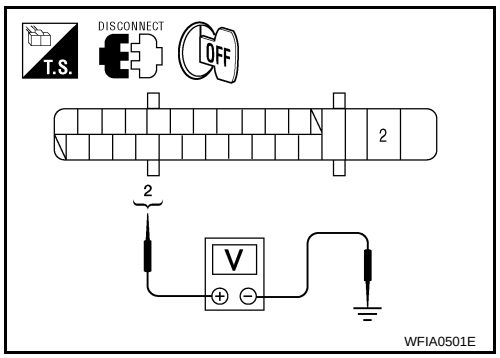
OK or NG

OK >> Inspection end.
NG >> GO TO 2..

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.

2. 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)

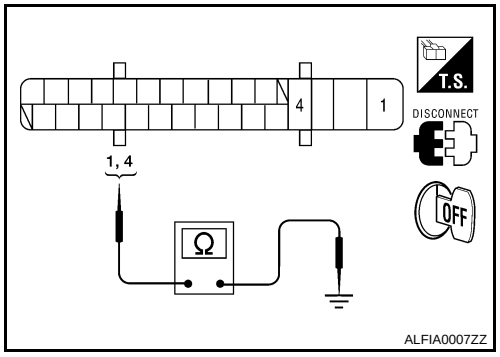
OK or NG

OK >> GO TO 3..

NG >> • 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

OK or NG

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

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

Component Inspection

INFOID:0000000000992634

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 BRC-154, "Diagnosis Procedure".

DTC C1114 MAIN RELAY

Description

INFOID:0000000000992635

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

DTC Logic

INFOID:0000000000992636

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 (control unit)
		During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open.	

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 BRC-156, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992637

INSPECTION PROCEDURE

1.CHECK CONNECTOR

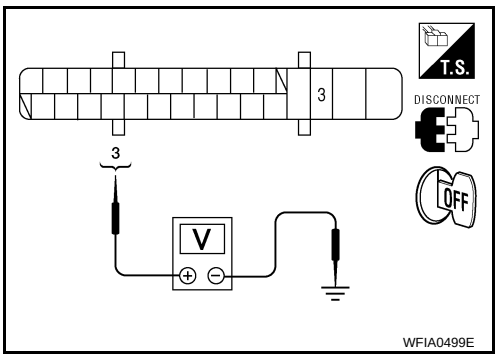
1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
2. Reconnect connector and perform self-diagnosis.

OK or NG

OK >> Inspection end.
NG >> 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.
2. Check voltage between ABS actuator and electric unit (control unit) harness connector E26 terminal 3 and ground.



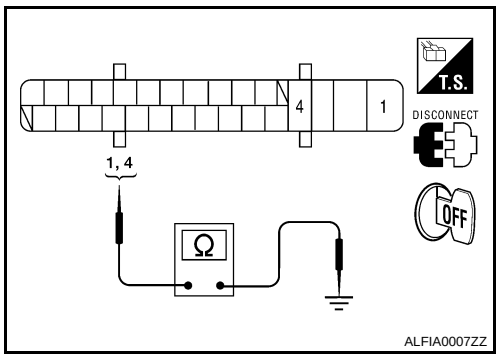
ABS actuator and electric unit (contorl unit)	Ground	Voltage
3	—	Battery voltage (Approx. 12 V)

OK or NG

OK >> GO TO 3..
NG >> • 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 (contorl unit)	Ground	Continuity
1, 4	—	Yes

OK or NG

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

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

Component Inspection

INFOID:0000000000992638

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 BRC-156, "Diagnosis Procedure".

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

Description

INFOID:0000000000992639

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:0000000000992640

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 BRC-158, "Diagnosis Procedure".
NO >> Inspection end.

Diagnosis Procedure

INFOID:0000000000992641

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.

OK or NG

OK >> GO TO 3..
NG >> • 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

1. 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.
2. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-138, "CONSULT-III Function (ABS)".

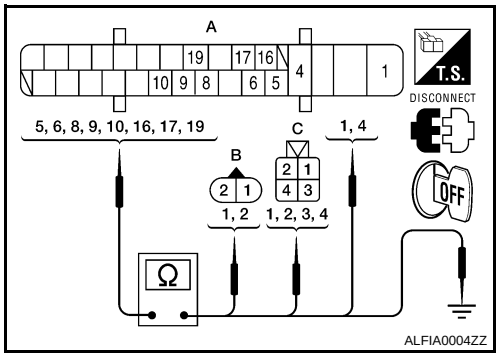
OK or NG

OK >> Inspection end.

NG >> GO TO 4..

4.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.)



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

OK or NG

OK >> GO TO 5..
NG >> • 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.
2. 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?

OK >> Inspection end.
NG >> • 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

INFOID:0000000000992642

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

Is the inspection result normal?

YES >> Inspection end.
NO >> Go to diagnosis procedure. Refer to BRC-158, "Diagnosis Procedure".

DTC C1116 STOP LAMP SW

Description

INFOID:0000000000992643

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

DTC Logic

INFOID:0000000000992644

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
STOP LAMP SWITCH

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-161, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992645

INSPECTION PROCEDURE

1.CHECK CONNECTOR

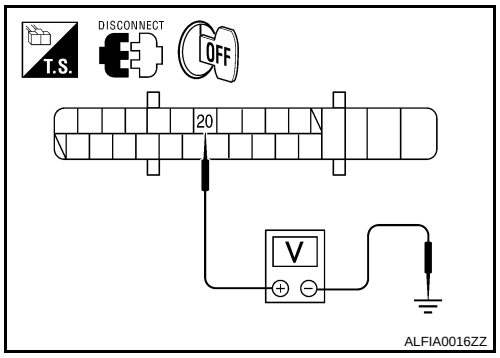
1. Turn ignition switch OFF and disconnect stop lamp switch connector E38 and ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
2. Reconnect connectors securely.
3. Start engine.
4. Repeat pumping brake pedal carefully several times, and perform self-diagnosis.

OK or NG

OK >> Inspection end.
NG >> GO TO 2..

2.CHECK STOP LAMP SWITCH 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 20 and ground.



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

OK or NG

OK >> Perform self-diagnosis.
NG >> • Repair or replace stop lamp switch circuit.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000000992646

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 lamp switch		Condition	Continuity
Connector	Terminals		
E38	1 – 2	Release stop lamp switch (When brake pedal is depressed.)	Yes
		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 BRC-132, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1120, C1122, C1124, C1126 IN ABS SOL

Description

INFOID:0000000000992647

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:0000000000992648

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.	• ABS actuator and electric unit (control unit)
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH inlet solenoid circuit.	
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH inlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-163, "Diagnosis Procedure".
NO >> Inspection end.

Diagnosis Procedure

INFOID:0000000000992649

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.

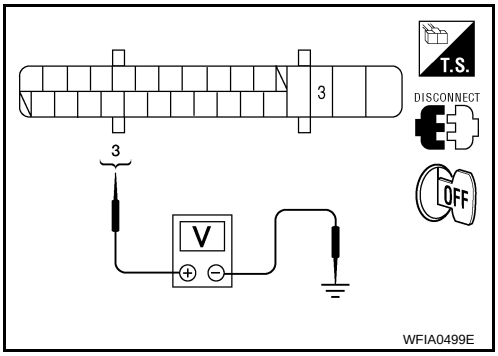
OK or NG

OK >> Inspection end.
NG >> 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.

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



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

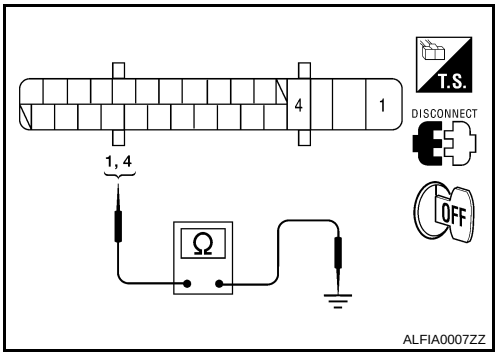
OK or NG

OK >> GO TO 3..

NG >> • 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 (contorl unit)	Ground	Continuity
1, 4	—	Yes

OK or NG

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

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

Component Inspection

INFOID:0000000000992650

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 BRC-163, "Diagnosis Procedure".

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

INFOID:0000000000992651

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:0000000000992652

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.	• ABS actuator and electric unit (control unit)
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-165, "Diagnosis Procedure".
NO >> Inspection end.

Diagnosis Procedure

INFOID:0000000000992653

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.

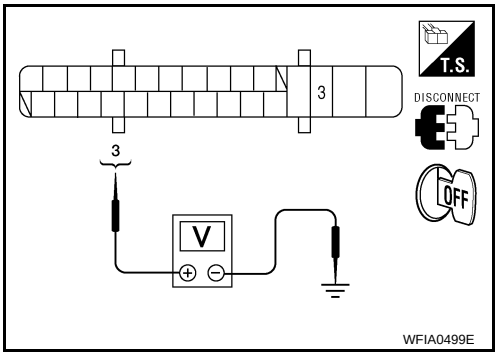
OK or NG

OK >> Inspection end.
NG >> 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.

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



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

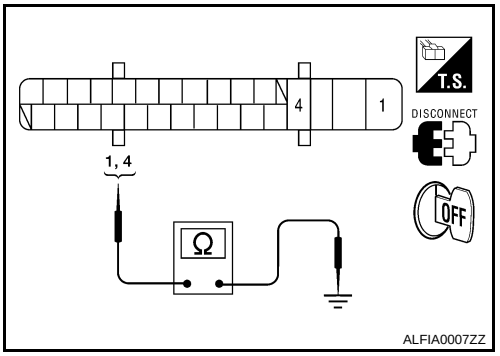
OK or NG

OK >> GO TO 3..

NG >> • 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 (contorl unit)	Ground	Continuity
1, 4	—	Yes

OK or NG

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

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

Component Inspection

INFOID:0000000000992654

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 BRC-165, "Diagnosis Procedure".

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description

INFOID:0000000000992655

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

DTC Logic

INFOID:0000000000992656

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1	Major engine components are malfunctioning.	• Harness or connector • ABS actuator and electric unit (control unit) • ECM • CAN communication line
C1131	ENGINE SIGNAL 2		
C1132	ENGINE SIGNAL 3		
C1133	ENGINE SIGNAL 4		
C1136	ENGINE SIGNAL 6		

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 6

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-167, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992657

INSPECTION PROCEDURE

1.CHECK ENGINE SYSTEM

1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to EC-20, "Work Flow" (VQ35DE), EC-528, "Work Flow" (QR25DE California), EC-1043, "Work Flow" (QR25DE non-Califoania).
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

OK or NG

OK >> Inspection end.
NG >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Special Repair Requirement

INFOID:0000000000992658

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 BRC-132, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

DTC C1142 PRESS SEN CIRCUIT

Description

INFOID:0000000000992659

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

INFOID:0000000000992660

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
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)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PRESS SEN CIRCUIT

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-169, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992661

INSPECTION PROCEDURE

1.CHECK STOP LAMP SWITCH CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Disconnect stop lamp switch connector.
4. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
5. Reconnect connectors securely.
6. Start engine.
7. Repeat pumping brake pedal carefully several times, and perform self-diagnosis.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Poor connection of connector terminal. Repair or replace connector..

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

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		
E26	20	Brake pedal is depressed	Battery voltage
		Brake pedal is released	Approx. 0 V

Is the inspection result normal?

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

INFOID:0000000000992662

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 BRC-169, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000000992663

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 BRC-132, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1143, C1144 STEERING ANGLE SENSOR

Description

INFOID:0000000000992664

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:0000000000992665

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ST ANG SEN CIRCUIT
ST ANG SEN SIGNAL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-171, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992666

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.

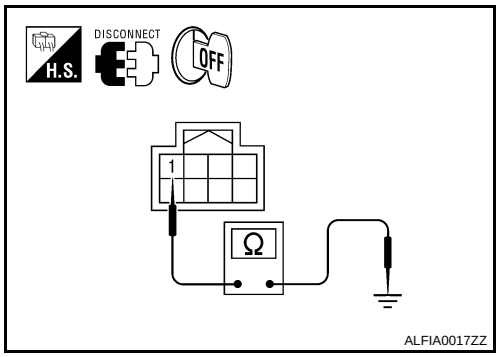
OK or NG

OK >> Inspection end.
NG >> GO TO 2..

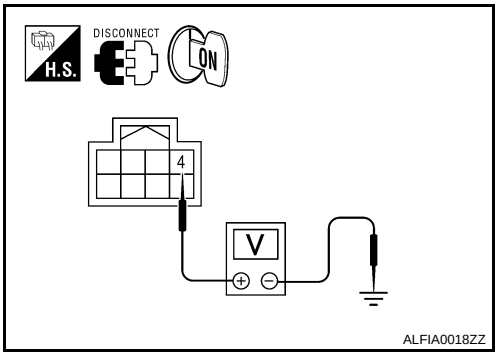
2.CHECK STEERING ANGLE SENSOR HARNESS

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

Steering angle sensor	Ground	Continuity
1	—	Yes



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)

OK or NG

OK >> GO TO 3..
NG >> • 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 °

OK or NG

OK >> Perform self-diagnosis.
NG >> • Replace spiral cable (steering angle sensor) and adjust neutral position of steering angle sensor. Refer to BRC-223, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000000992667

1.CHECK DATA MONITOR

Select “STR ANGLE SIG” in “DATA MONITOR” and check steering angle sensor signal.

Steering condition	STR ANGLE SIG (DATA MONITOR)
Driving straight	±2.5 °
Turn 90 ° to right	Approx. +90 °
Turn 90 ° to left	Approx. –90 °

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-171, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000000992668

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 BRC-223, "Removal and Installation".

>> END

C1145, C1146 YAW RATE/SIDE G SENSOR

Description

INFOID:0000000000992669

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

DTC Logic

INFOID:0000000000992670

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
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 (control unit) • Yaw rate/side G sensor
C1146	SIDE G-SEN CIRCUIT	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	

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 BRC-173, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992671

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. However, 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 malfunction. However, in this case there is no malfunction in yaw rate sensor system. Take vehicle off of turn-table or other moving surface, and start engine. Results will return to normal. And after doing spin turns or acceleration turns with VDC function is being off (VDC OFF switch “ON”), too, the results will return to a normal condition by re-starting vehicle.**

INSPECTION PROCEDURE

1.CHECK CONNECTOR

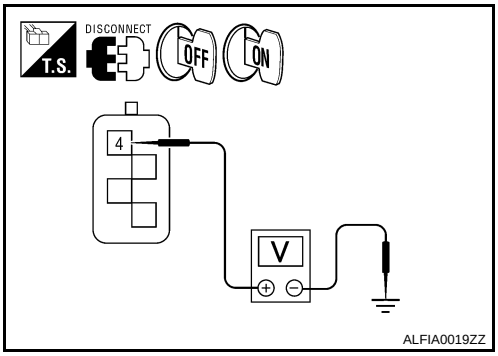
1. Turn ignition switch OFF and disconnect yaw rate/side/decel G sensor connector M55 and ABS actuator and electric unit (control unit) connector E26, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
2. Reconnect connector and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

OK or NG

OK >> Inspection end.
NG >> GO TO 2..

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

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



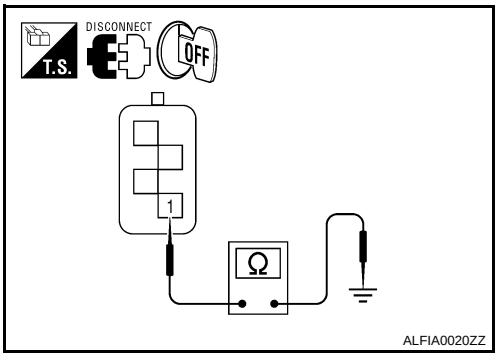
Yaw rate/side/decel G sensor	Ground	Condition	Voltage
4	—	Ignition switch ON	Battery voltage (Approx. 12 V)
		Ignition switch OFF	Approx. 0V

OK or NG

OK >> GO TO 3..
NG >> • 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.



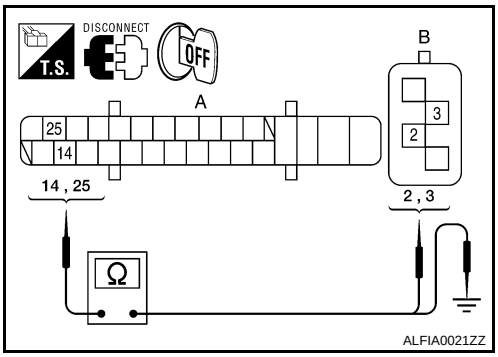
Yaw rate/side/decel G sensor	Ground	Condition	Continuity
1	—	Ignition switch OFF	Yes

OK or NG

OK >> GO TO 4..
NG >> • 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

1. 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	

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

ABS actuator and electric unit (control unit)	Ground	Continuity
14	—	No
25		

OK or NG

OK >> GO TO 5..
NG >> • 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.
2. 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
Turning right	Negative value	Negative value
Turning left	Positive value	Positive value

OK or NG

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

NG >> • 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:0000000000992672

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)
Stopped	Approx. 0 d/s	Approx. 0 m/s^2
Turning right	Negative value	Negative value
Turning left	Positive value	Positive value

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-173, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000000992673

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 BRC-223, "Removal and Installation".

>> END

C1147, C1148, C1149, C1150 USV/HSV LINE

Description

INFOID:0000000000992674

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:0000000000992675

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.	• Harness or connector • ABS actuator and electric unit (control unit)
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.	
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.	
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 BRC-176, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992676

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.

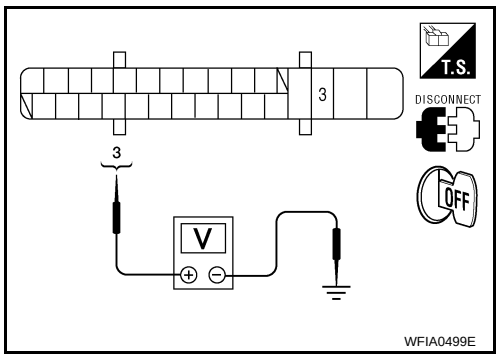
OK or NG

OK >> Inspection end.
NG >> GO TO 2..

2.CHECK SOLENOID, VDC CHANGE-OVER VALVE 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 (contorl unit)	Ground	Voltage
3	—	Battery voltage (Approx. 12 V)

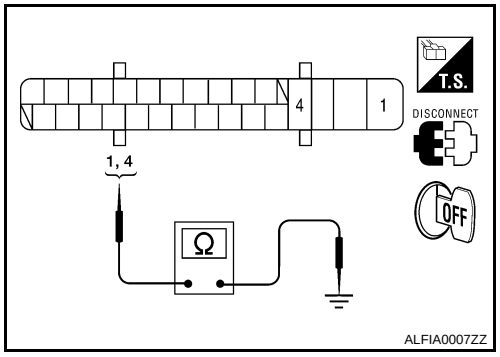
OK or NG

OK >> GO TO 3..

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

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 (contorl unit)	Ground	Continuity
1, 4	—	Yes

OK or NG

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

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

Component Inspection

INFOID:0000000000992677

1. CHECK ACTIVE TEST

1. Select each test menu item on ”ACTIVE TEST“.
2. 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 (Note)	ABS solenoid valve (ACT)		
	UP	ACT UP	ACT KEEP
FR RH IN SOL	OFF	OFF	OFF
FR RH OUT SOL	OFF	OFF	OFF
USV [FR-RL]	OFF	ON	ON
HSV [FR-RL]	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.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to BRC-176, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000000992678

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 BRC-132, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

DTC C1154 PNP POS SIG

Description

INFOID:0000000000992679

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:0000000000992680

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1154	PNP POS SIG	Park/Neutral position signal or communication line between the ABS actuator and electric unit (control unit) and TCM is open or shorted.	• Harness or connector • PNP switch

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PNP POS SIG

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-179, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992681

INSPECTION PROCEDURE

1.CHECK DATA MONITOR

Select “SLCT LVR POSI” in “Data Monitor” and check Park/Neutral position switch signal.

Selector lever position	SLCT LVR POSI (Data monitor)
P position	P
R position	R
N position	N
D position	D

OK or NG

OK >> • Replace ABS actuator and electric unit (control unit).
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NG >> GO TO 2..

2.CHECK PARK/NEUTRAL POSITION (PNP) SWITCH

Perform Park/Neutral position switch inspection. Refer to TM-123, "Description".

OK or NG

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

DTC C1155 BR FLUID LEVEL LOW

Description

INFOID:0000000000992682

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

INFOID:0000000000992683

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BR FLUID LEVEL LOW

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-180, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000000992684

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

INSPECTION PROCEDURE

1.CHECK CONNECTOR

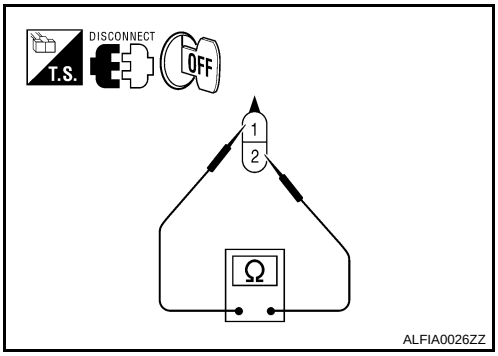
1. Turn ignition switch OFF and disconnect brake fluid level switch connector E24 and combination meter connector M24, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
2. Reconnect connector and perform self-diagnosis.

OK or NG

OK >> Inspection end.
NG >> GO TO 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.



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

OK or NG

OK >> GO TO 3..
NG >> • Brake fluid level switch is malfunctioning. Replace reservoir tank. Refer to BR-36, "Exploded View".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

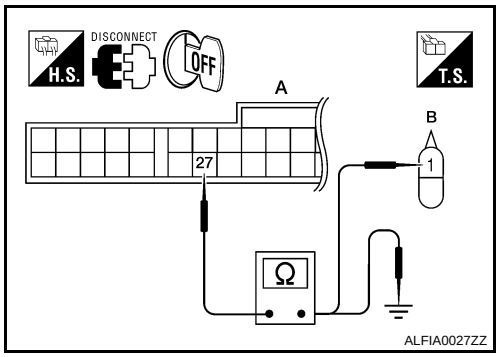
3.CHECK BRAKE FLUID LEVEL SWITCH HARNESS

1. Disconnect combination meter connector M24.
2. Check continuity between combination meter connector M24 (A) terminal 27 and brake fluid level switch connector E24 (B) terminal 1.

27 - 1 : Continuity should exist.

3. Check continuity between combination meter connector M24 (A) terminal 27 and ground.

27 - Ground : Continuity should not exist.



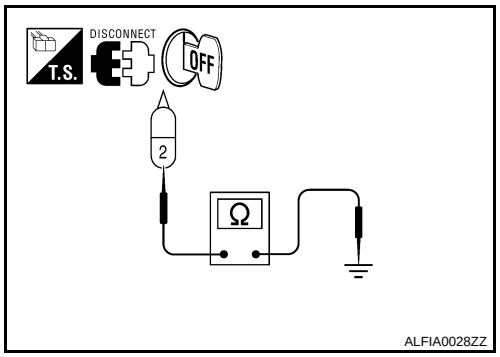
OK or NG

OK >> GO TO 4.
NG >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

4.CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

Check continuity between brake fluid level switch connector E24 (B) terminal 2 and ground.

2 - Ground : Continuity should exist.



OK or NG

OK >> Brake fluid level switch circuit is OK.
NG >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000000992685

1.CHECK BRAKE FLUID LEVEL SWITCH

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

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

Is the inspection result normal?

YES >> INSPECTION END..
NO >> Replace reservoir tank.

Special Repair Requirement

INFOID:0000000000992686

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 BRC-223, "Removal and Installation".

>> END

DTC C1156 ST ANG SEN COM CIR

Description

INFOID:0000000000992687

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:0000000000992688

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1156	ST ANG SEN COM CIR	When steering angle sensor is not transmitting CAN communication signal to the ABS actuator and electric unit (control unit).	• Harness or connector • CAN communication line • Steering angle sensor • ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ST ANG SEN COM CIR

Is above displayed on the self-diagnosis display?

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

Diagnosis Procedure

INFOID:0000000000992689

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
ST ANG SEN COM CIR

Is above displayed on the self-diagnosis display?

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

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000000992690

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:0000000000992691

DTC DETECTION LOGIC

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

Diagnosis Procedure

INFOID:0000000000992692

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

Description

INFOID:0000000000992693

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

INFOID:0000000000992694

1.CHECK PARKING BRAKE SWITCH OPERATION

Operate the parking brake. Then check that the brake warning lamp in the combination meter turns on/off correctly.

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 BRC-185, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000000992695

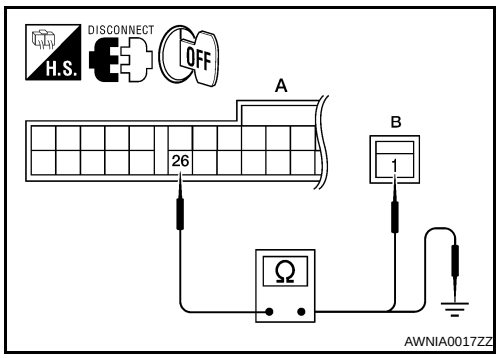
1.CHECK PARKING BRAKE SWITCH CIRCUIT

1. Disconnect combination meter connector and parking brake switch connector.
2. Check continuity between combination meter harness connector M24 (A) terminal 26 and parking brake switch harness connector M73 (B) (with CVT) or E35 (B) (with M/T) 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.



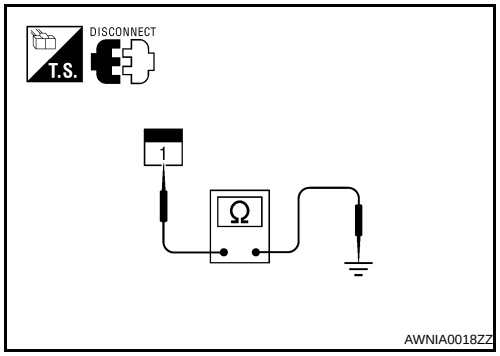
OK or NG

OK >> GO TO 2.
NG >> 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
		Parking brake released	No



OK or NG

OK >> Check parking brake switch case ground condition.
NG >> Replace parking brake switch.

Component Inspection

INFOID:0000000000992696

INSPECTION PROCEDURE

1. CHECK PARKING BRAKE SWITCH

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

Parking brake switch		—	Condition	Continuity
Connector	Terminal			
E35 (M/T models) M73 (CVT models)	1	Ground	When the parking brake is engaged.	Yes
			When the parking brake is released.	No

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Replace parking brake switch.

VDC OFF SWITCH

Description

INFOID:0000000000992697

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

Component Function Check

INFOID:0000000000992698

1.CHECK VDC 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.

Condition	VDC OFF indicator lamp illumination status
VDC OFF switch: ON	ON
VDC OFF switch: OFF	OFF

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-187, "Diagnosis Procedure".

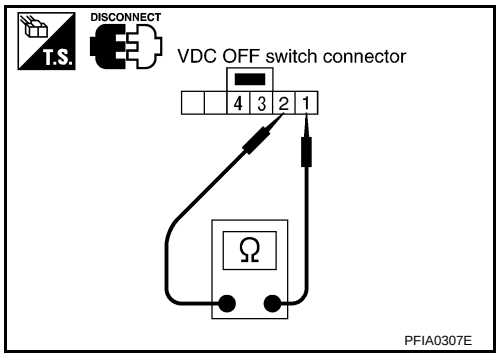
Diagnosis Procedure

INFOID:0000000000992699

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.



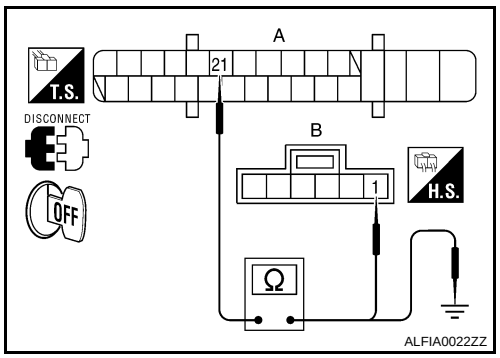
VDC OFF switch	Condition	Continuity
1, 2	VDC OFF switch ON	Yes
	VDC OFF switch OFF	No

OK or NG

OK >> GO TO 2..
NG >> 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.
2. 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.

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

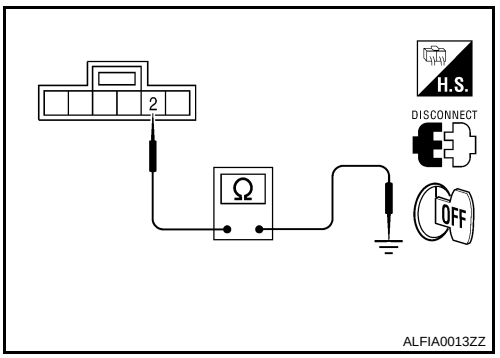
OK or NG

OK >> Inspection end.
NG >> 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



OK or NG

OK >> Inspection end.
NG >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000000992700

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.

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace TCS OFF switch.

ABS WARNING LAMP

Description

INFOID:0000000000992701

×: 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:0000000000992702

1.CHECK ABS WARNING LAMP OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-189, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000000992703

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-138, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-3, "Work Flow".

Is the inspection result normal?

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

BRAKE WARNING LAMP

Description

INFOID:0000000000992704

×: 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:0000000000992705

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 BRC-190, "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 brakes.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check parking brake switch. Refer to MWI-28, "Description".

Diagnosis Procedure

INFOID:0000000000992706

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 MWI-28, "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 MWI-3, "Work Flow".

Is the inspection result normal?

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

VDC OFF INDICATOR LAMP

Description

INFOID:0000000000992707

×: ON –: OFF

Condition	VDC OFF indicator lamp
Ignition switch OFF	–
For 1 second after turning ON ignition switch	×
1 second later after turning ON ignition switch	–
VDC OFF switch turned ON. (VDC function is OFF.)	×
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000000992708

1.VDC OFF INDICATOR LAMP OPERATION CHECK 1

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

Is the inspection result normal?

YES >> GO TO 2..
NO >> Go to diagnosis procedure. Refer to BRC-191, "Diagnosis Procedure".

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check VDC OFF switch. Refer to BRC-187, "Description".

Diagnosis Procedure

INFOID:0000000000992709

1.CHECK VDC OFF SWITCH

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> GO TO 2..
NO >> Check VDC OFF switch. Refer to BRC-187, "Diagnosis Procedure".

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-138, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 3..
NO >> Check items displayed by self-diagnosis.

3.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-3, "Work Flow".

Is the inspection result normal?

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

SLIP INDICATOR LAMP

Description

INFOID:0000000000992710

×: ON –: OFF

Condition	SLIP indicator lamp
Ignition switch OFF	–
For 1 second after turning ON ignition switch	×
1 second later after turning ON ignition switch	–
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000000992711

1.CHECK SLIP INDICATOR LAMP OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to BRC-192, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000000992712

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-138, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 2..
NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-3, "Work Flow".

Is the inspection result normal?

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

ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000000992713

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	Wheel speed	0 [km/h]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
STOP LAMP SW	Brake pedal operation	When brake pedal is depressed	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
SLCT LVR POSI	A/T shift position	P position R position N position D position	P R N D
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON
		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF
YAW RATE SEN	Yaw rate detected by yaw rate/side G sensor	When vehicle stop	Approx. 0 d/s
		When vehicle turning	-75 to 75 d/s
ACCEL POS SIG	Throttle actuator opening/closing is displayed (linked with accelerator pedal)	Accelerator pedal not depressed (ignition switch is ON)	0 %
		Depress accelerator pedal (ignition switch is ON)	0 - 100 %
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle stopped	Approx. 0 m/s^2
		Vehicle turning right	Negative value (m/s^2)
		Vehicle turning left	Positive value (m/s^2)
STR ANGLE SIG	Steering angle detected by steering angle sensor	Straight-ahead	Approx. 0°
		Steering wheel turned	–720 to 720°
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar
		With ignition switch turned ON and brake pedal depressed	–40 to 300 bar

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
ENGINE RPM	With engine running	With engine stopped	0 rpm
		Engine running	Almost in accordance with tachometer 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	Parking brake switch	Parking brake switch is active	ON
		Parking brake switch is inactive	OFF
FR RH IN SOL FR RH OUT SOL FR LH IN SOL FR LH OUT SOL RR RH IN SOL RR RH OUT SOL RR LH IN SOL RR LH OUT SOL	Operation status of all solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY (Note 2)	Actuator relay operation	When the actuator relay is operating	ON
		When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp (Note 3)	When ABS warning lamp is ON	ON
		When ABS warning lamp is OFF	OFF
OFF LAMP	VDC OFF indicator lamp (Note 3)	When VDC OFF indicator lamp is ON	ON
		When VDC OFF indicator lamp is OFF	OFF
SLIP LAMP	SLIP indicator lamp (Note 3)	When SLIP indicator lamp is ON	ON
		When SLIP indicator lamp is OFF	OFF
SNOW MODE SW	Snow mode switch	When snow mode switch is ON	ON
		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

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
EBD SIGNAL	EBD operation	EBD is active	ON
		EBD is inactive	OFF
ABS SIGNAL	ABS operation	ABS is active	ON
		ABS is inactive	OFF
TCS SIGNAL	TCS operation	TCS is active	ON
		TCS is inactive	OFF
VDC SIGNAL	VDC operation	VDC is active	ON
		VDC is inactive	OFF
EBD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	ON
		EBD is normal	OFF
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	ON
		ABS is normal	OFF
TCS FAIL SIG	TCS fail-safe signal	In TCS fail-safe	ON
		TCS is normal	OFF
VDC FAIL SIG	VDC fail-safe signal	In VDC fail-safe	ON
		VDC is normal	OFF
CRANKING SIG	Crank operation	Crank is active	ON
		Crank is inactive	OFF
USV HSV (FL-RR, FR-RL) (Note 2)	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
V/R OUTPUT (Note 2)	Solenoid valve relay activated	When the solenoid valve relay is active (When ignition switch OFF)	ON
		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 active (″ACTIVE TEST” with CONSULT-III)	ON
		When the actuator motor and motor relay are inactive	OFF

Note 1: Confirm tire pressure is normal.

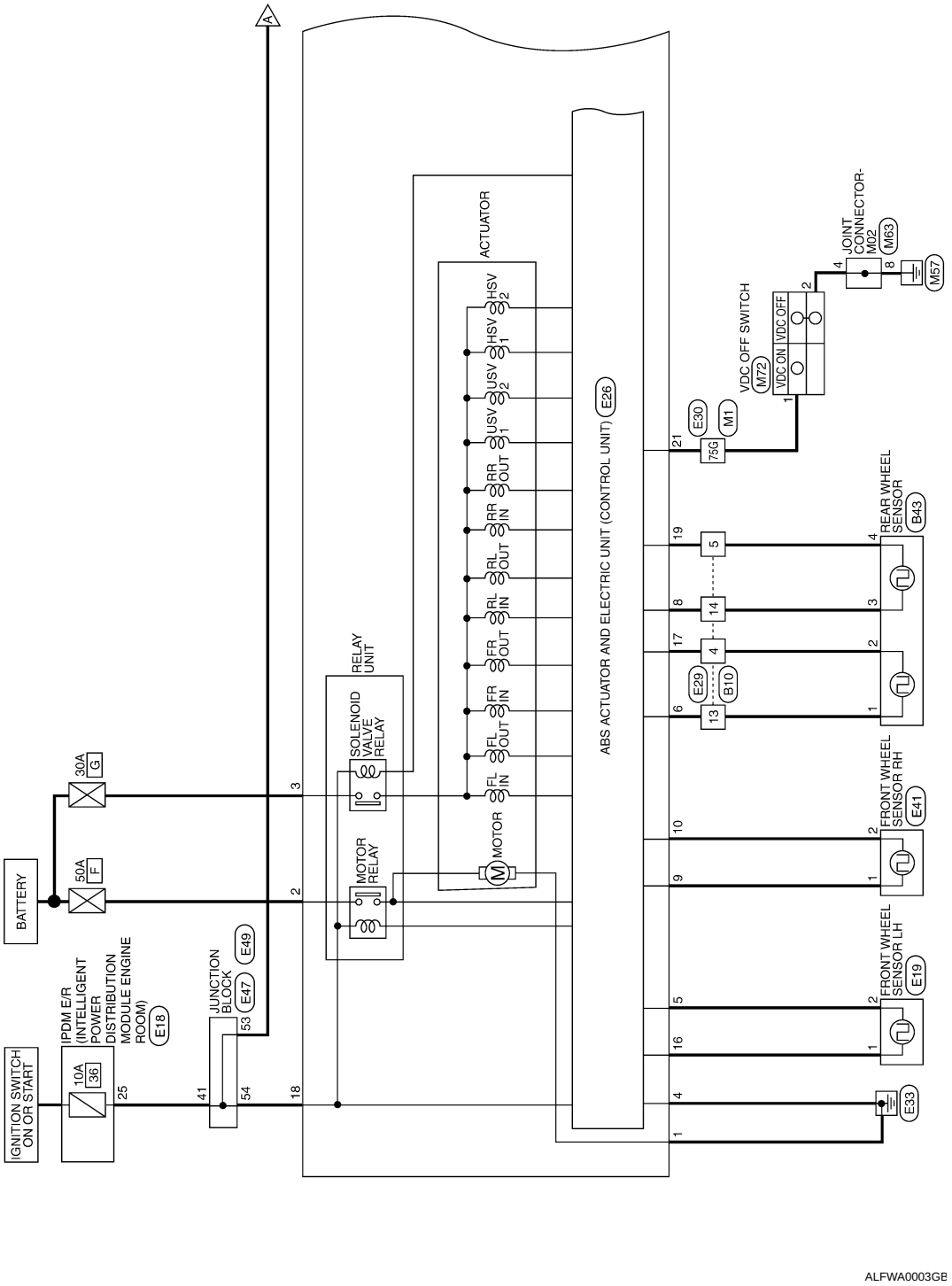
Note 2: A brief moment of ON/OFF condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

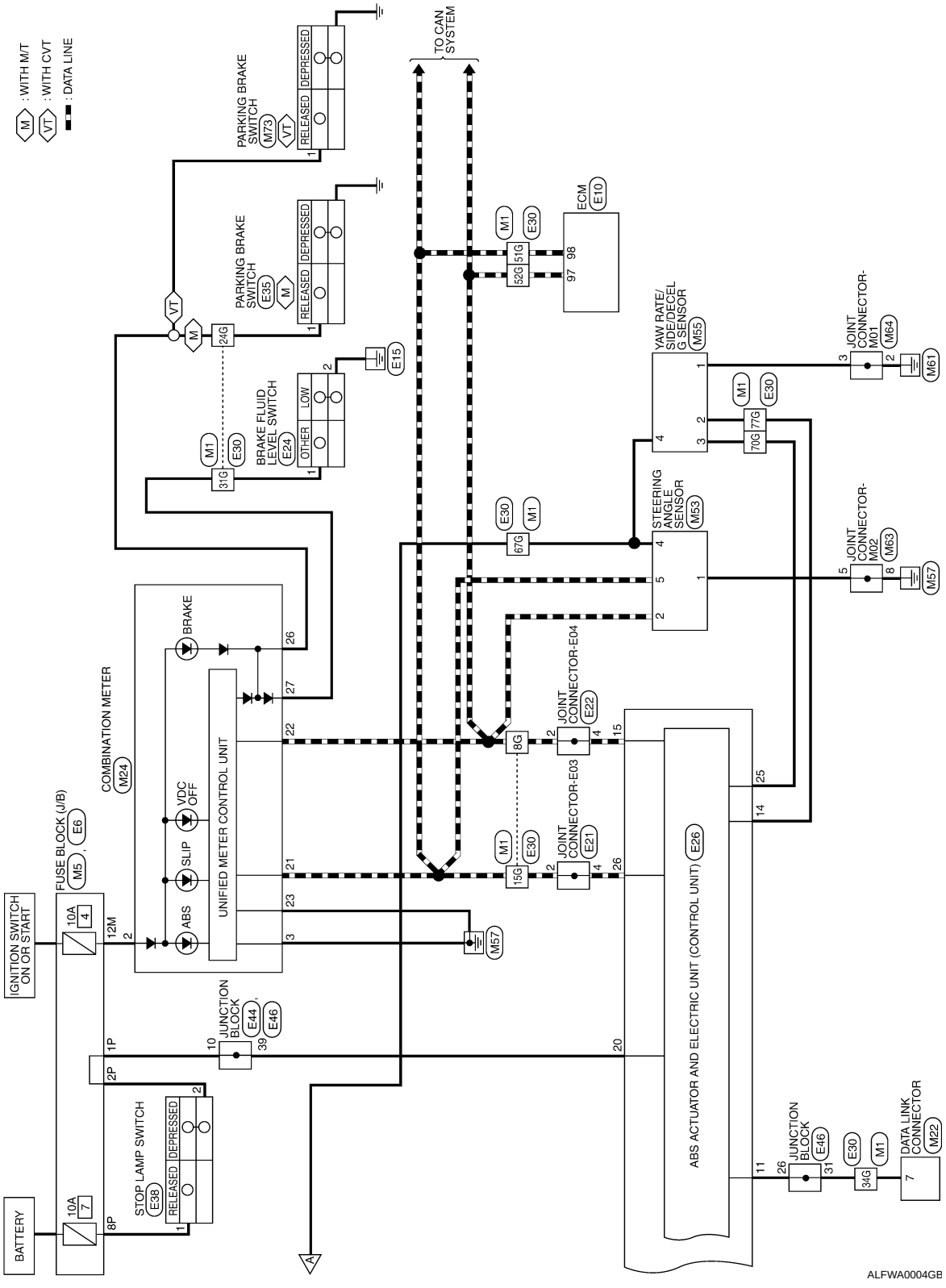
Note 3: On and off timing for warning lamp and indicator lamp. Refer to BRC-134, "System Description".

Wiring Diagram

INFOID:0000000000992714

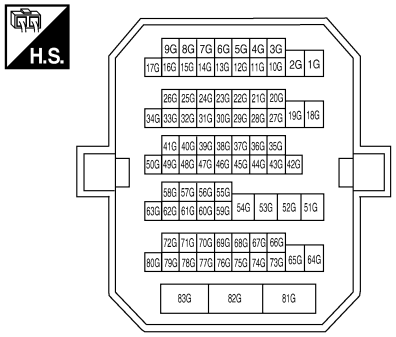
BRAKE CONTROL SYSTEM (VDC)




: WITH M/T
: WITH CVT
: DATA LINE
TO CAN SYSTEM
PARKING BRAKE SWITCH M73
PARKING BRAKE SWITCH E35
BRAKE FLUID LEVEL SWITCH E24
ECM E10
YAW RATE/ SIDE/DECEL G SENSOR M55
STEERING ANGLE SENSOR M53
JOINT CONNECTOR-M01 M64
JOINT CONNECTOR-M02 M63
COMBINATION METER M24
UNIFIED METER CONTROL UNIT
BRAKE
VDC OFF
SLIP
ABS
FUSE BLOCK (J/B) M5, E6
IGNITION SWITCH ON OR START
BATTERY
STOP LAMP SWITCH E38
JUNCTION BLOCK E44, E46
JOINT CONNECTOR-E04 E22
JOINT CONNECTOR-E03 E21
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) E26
JUNCTION BLOCK E46
DATA LINK CONNECTOR M22
ALFWA0004GB

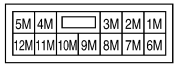
BRAKE CONTROL SYSTEM (VDC) CONNECTORS

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



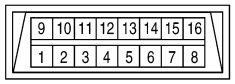
Terminal No.	Color of wire	Signal Name
8G	P	–
15G	L	–
24G	G/R	–
31G	V	–
34G	O	–
51G	L	–
52G	P	–
67G	GR	–
70G	Y	–
75G	SB	–
77G	Y/B	–

Connector No.	M5
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



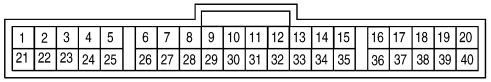
Terminal No.	Color of wire	Signal Name
12M	P	–

Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Color	WHITE



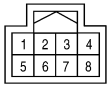
Terminal No.	Color of wire	Signal Name
7	O	K-LINE

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



Terminal No.	Color of wire	Signal Name
2	O	IGN
3	B	GND
21	L	CAN-H
22	P	CAN-L
23	B	GND
26	G/R	PKB
27	V	BRAKE OIL IN

Connector No.	M53
Connector Name	STEERING ANGLE SENSOR
Connector Color	WHITE



Terminal No.	Color of wire	Signal Name
1	B	GND
2	P	CAN-L
4	GR	IG
5	L	CAN-H

ALFIA0025GB

Connector No.	M55
Connector Name	YAW RATE/SIDE/DECEL G SENSOR
Connector Color	BLACK

H.S.

Terminal No.	Color of wire	Signal Name
1	B	GND
2	Y/B	CAN-L
3	Y	CAN-H
4	GR	IG

Connector No.	M63
Connector Name	JOINT CONNECTOR-M02
Connector Color	BLUE

H.S.

Terminal No.	Color of wire	Signal Name
4	B	–
5	B	–
8	B	–

Connector No.	M64
Connector Name	JOINT CONNECTOR-M01
Connector Color	GRAY

H.S.

Terminal No.	Color of wire	Signal Name
2	B	–
3	B	–

Connector No.	M72
Connector Name	VDC OFF SWITCH
Connector Color	GRAY

H.S.

Terminal No.	Color of wire	Signal Name
1	SB	–
2	B	–

Connector No.	M73
Connector Name	PARKING BRAKE SWITCH (WITH M/T)
Connector Color	BLACK

H.S.

Terminal No.	Color of wire	Signal Name
1	G/R	–

Connector No.	E6
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
1P	SB	–
2P	R/G	–
8P	Y/R	–

ALFIA0039GB

Connector No.	E10
Connector Name	ECM
Connector Color	BLACK

H.S.

81	85	89	93	97	101	105	109
82	86	90	94	98	102	106	110
83	87	91	95	99	103	107	111
84	88	92	96	100	104	108	112

Terminal No.	Color of wire	Signal Name
97	P	CAN-L
98	L	CAN-H

Connector No.	E18
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

9	10	11	12	13	14
3	4	5	6	7	8

25	26	27	28	29	30	31	32	33	34
15	16	17	18	19	20	21	22	23	24

37	38
35	36

Terminal No.	Color of wire	Signal Name
25	GR	ABS_ECU

Connector No.	E19
Connector Name	FRONT WHEEL SENSOR LH
Connector Color	GRAY

H.S.

1	2

Terminal No.	Color of wire	Signal Name
1	G	–
2	R	–

Connector No.	E21
Connector Name	JOINT CONNECTOR-E03
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of wire	Signal Name
2	L	–
4	L	–

Connector No.	E22
Connector Name	JOINT CONNECTOR-E04
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of wire	Signal Name
2	P	–
4	P	–

Connector No.	E24
Connector Name	BRAKE FLUID LEVEL SWITCH
Connector Color	GRAY

H.S.

1	2

Terminal No.	Color of wire	Signal Name
1	V	–
2	B/Y	–

ALFIA0040GB

Connector No.	E26
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color	BLACK

H.S.

Terminal No.	Color of wire	Signal Name
5	R	DS FL
6	L/Y	DP RL
8	W/R	DP RR
9	B	DP FR
10	W	DS FR
11	O	DIAG-K
14	Y/B	CAN-M2
15	P	CAN-L
16	G	DP FL
17	R/W	DS RL
18	GR/R	UZ
19	B/R	DS RR
20	P/B	BLS
21	SB	ASR AUS
25	Y	CAN-P2
26	L	CAN-H

Terminal No.	Color of wire	Signal Name
1	B	MGND
2	G/R	UB (MR)
3	R/B	UB (VR)
4	B	GND

Connector No.	E29
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
4	R/W	–
5	B/R	–
13	L/Y	–
14	W/R	–

Connector No.	E35
Connector Name	PARKING BRAKE SWITCH (WITH CVT)
Connector Color	BLACK

H.S.

Terminal No.	Color of wire	Signal Name
1	G/R	–

Terminal No.	Color of wire	Signal Name
8G	P	–
15G	L	–
24G	G/R	–
31G	V	–
34G	O	–
51G	L	–
52G	P	–
67G	GR	–
70G	Y	–
75G	SB	–
77G	Y/B	–

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

ALFIA0041GB

Connector No.	E38
Connector Name	STOP LAMP SWITCH (WITH CVT)
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
1	Y/R	–
2	R/G	–
3	G/R	–
4	R/W	–

Connector No.	E38
Connector Name	STOP LAMP SWITCH (WITH M/T)
Connector Color	BLACK

H.S.

Terminal No.	Color of wire	Signal Name
1	Y/R	–
2	R/G	–

Connector No.	E41
Connector Name	FRONT WHEEL SENSOR RH
Connector Color	GRAY

H.S.

Terminal No.	Color of wire	Signal Name
1	B	–
2	W	–

Connector No.	E44
Connector Name	JUNCTION BLOCK
Connector Color	BROWN

H.S.

Terminal No.	Color of wire	Signal Name
10	SB	–

Connector No.	E46
Connector Name	JUNCTION BLOCK
Connector Color	WHITE

H.S.

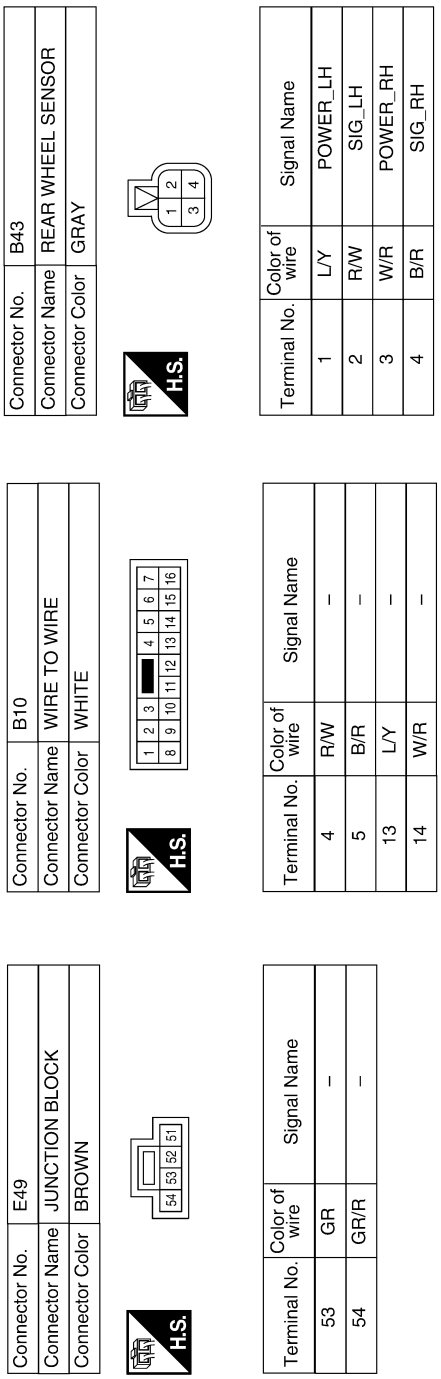
Terminal No.	Color of wire	Signal Name
26	O	–
31	O	–
39	P/B	–

Connector No.	E47
Connector Name	JUNCTION BLOCK
Connector Color	WHITE

H.S.

Terminal No.	Color of wire	Signal Name
41	GR	–

ALFIA0042GB



ALFIA0043GB

Fail-Safe

INFOID:0000000000992715

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.

DTC No. Index

INFOID:0000000000992716

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.	BRC-145, "Diagnosis Procedure" (Note 1)
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.	BRC-148, "Diagnosis Procedure" (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 distance 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-151, "Diagnosis Procedure"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-153, "Diagnosis Procedure"
PUMP MOTOR [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.	BRC-154, "Diagnosis Procedure"
	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	
MAIN RELAY [C1114]	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-156, "Diagnosis Procedure"
	During the actuator relay operating with ON, when the actuator relay turns OFF, or when the control line for the relay is open.	
ABS SENSOR [ABNORMAL SIGNAL] [C1115]	When wheel sensor input signal is malfunctioning.	BRC-158, "Diagnosis Procedure" (Note 1)
STOP LAMP SW [C1116]	When stop lamp switch circuit is open.	BRC-161, "Diagnosis Procedure"

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.	BRC-163, "Diagnosis Procedure"
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	
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.	BRC-165, "Diagnosis Procedure"
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	
ENGINE SIGNAL 1 [C1130]	Major engine components are malfunctioning.	BRC-167, "Diagnosis Procedure"
ENGINE SIGNAL 2 [C1131]		
ENGINE SIGNAL 3 [C1132]		
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-169, "Diagnosis Procedure"
ST ANG SEN CIRCUIT [C1143]	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	BRC-171, "Diagnosis Procedure"
ST ANG SEN SIGNAL [C1144]	Neutral position correction of steering angle sensor is not finished.	
YAW RATE SENSOR [C1145]	Yaw rate sensor is malfunctioning, or the yaw rate sensor signal line is open or shorted.	BRC-173, "Diagnosis Procedure"
SIDE G-SEN CIRCUIT [C1146]	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	
USV LINE [FL-RR] [C1147]	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.	BRC-176, "Diagnosis Procedure"
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.	
HSV LINE [FL-RR] [C1149]	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.	
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 increase is too much or too little)	BRC-153, "Diagnosis Procedure"
PNP POS SIG [C1154]	TCM or ABS actuator and electric unit (control unit) internal malfunction.	BRC-179, "Diagnosis 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-180, "Diagnosis Procedure"
ST ANG SEN COM CIR [C1156]	CAN communication circuit or steering angle sensor is malfunctioning.	BRC-183, "Diagnosis Procedure"

Display item	Malfunction detecting condition	Check item
VARIANT CODING [C1170]	In a case where VARIANT CODING is different.	BRC-153, "Diagnosis Procedure"
CAN COMM CIRCUIT [U1000]	When there is a malfunction in the CAN communication circuit.	BRC-184, "Diagnosis 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 BRC-184, "Diagnosis Procedure".

SYMPTOM DIAGNOSIS

VDC/TCS/ABS

Symptom Table

INFOID:0000000000992717

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

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-208, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-209, "Diagnosis Procedure"
	Make sure the braking force is sufficient when the ABS is not operating.	
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-210, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-211, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-212, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-213, "Diagnosis Procedure"
	TCM	
	ECM	

NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal.

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

Diagnosis Procedure

INFOID:0000000000992718

1.CHECK START

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

OK or NG

OK >> GO TO 2..
NG >> 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: FAX-5, "Inspection", Rear: RAX-5, "On-vehicle Service".

OK or NG

OK >> GO TO 3..
NG >> 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.

OK or NG

OK >> GO TO 4..
NG >>
- 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.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-138, "CONSULT-III Function (ABS)".

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000000992719

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-12, "Inspection and Adjustment".

Is the stroke too big?

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

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.

OK or NG

OK >> GO TO procedure 3 “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom 1. Refer to BRC-208, "Diagnosis Procedure".

NG >> Check brake system.

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000000992720

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.

OK or NG

OK >> GO TO procedure “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom. Refer to BRC-208, "Diagnosis Procedure".

NG >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000000992721

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.

OK or NG

OK >> GO TO procedure “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom. Refer to BRC-208, "Diagnosis Procedure".

NG >> Perform self-diagnosis. Refer to BRC-138, "CONSULT-III Function (ABS)".

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000000992722

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 BRC-138, "CONSULT-III Function (ABS)".

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 BRC-208, "Diagnosis Procedure".

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000000992723

1.SYMPTOM CHECK

Check if the vehicle jerks during VDC/TCS/ABS control.

OK or NG

OK >> Normal.
NG >> 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 A/T SELF-DIAGNOSIS RESULTS

Perform ECM and CVT self-diagnosis.

Are self-diagnosis results indicated?

YES >> Check the corresponding items.
- ECM: Refer to EC-20 (VQ35DE), EC-528 (QR25DE-California), EC-1043 (QR25DE-Except California).
- CVT: Refer to TM-84.

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

PRECAUTION

PRECAUTIONS

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

INFOID:0000000000992724

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 SRS and SB section of this Service Manual.

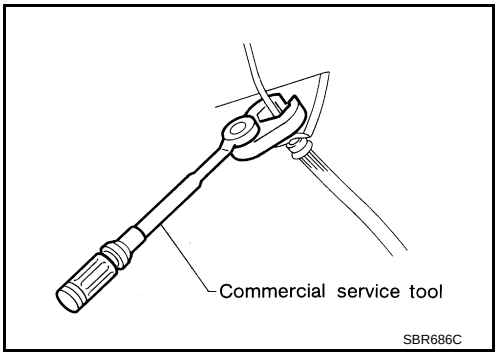
WARNING:

- **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 SRS 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

INFOID:0000000000992725

- 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:0000000000992726

- 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.

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

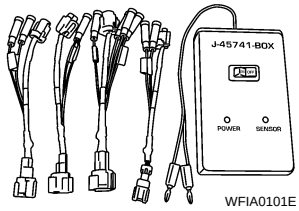
PREPARATION

PREPARATION

Special Service Tool

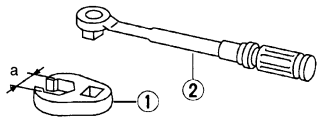
INFOID:0000000000992727

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  WFIA0101E	Checking operation of ABS active wheel sensor

Commercial Service Tool

INFOID:0000000000992728

Tool name	Description
1. Flare nut crowfoot 2. Torque wrench  S-NT360	Removing and installing brake piping **a: 10mm (0.39 in)/12mm (0.47 in)**

ON-VEHICLE REPAIR

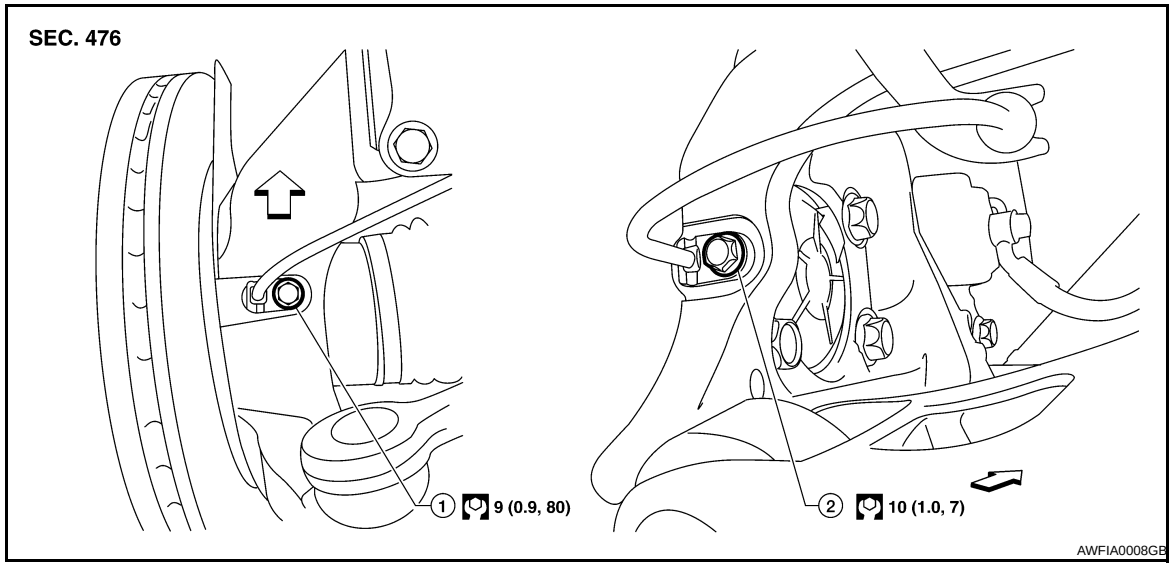
WHEEL SENSORS

Exploded View

INFOID:0000000000992729

Removal and Installation

INFOID:0000000000992730



1. Front wheel sensor
2. Rear wheel sensor
⇐ Front

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 mounting 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 mounting the wheel sensor, or if a foreign object is caught in the surface of the mounting for the rotor. If something wrong is found, fix it and then install the wheel sensor.**

REMOVAL

Front

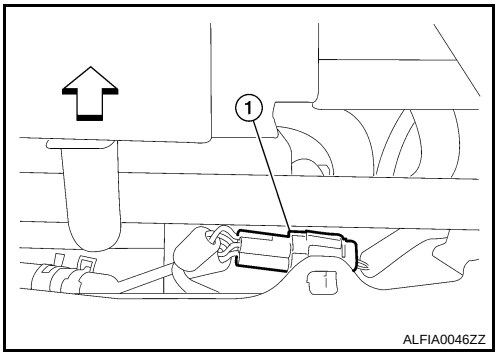
1. Remove wheel and tire using power tool.
2. Partially front wheel fender protector. Refer to EXT-18, "Removal and Installation".
3. Remove wheel sensor bolt and wheel sensor.
4. Remove harness wire from mounts and disconnect wheel sensor harness connector.

Rear

NOTE:
Both 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.
3. Remove harness wire from mounts and harness wire clips from suspension member.

4. Disconnect wheel sensor harness connector (1).



INSTALLATION

Installation is in the reverse order of removal.

- When installing wheel and tire, refer to WT-33, "Adjustment".

SENSOR ROTOR

Removal and Installation

INFOID:0000000000992731

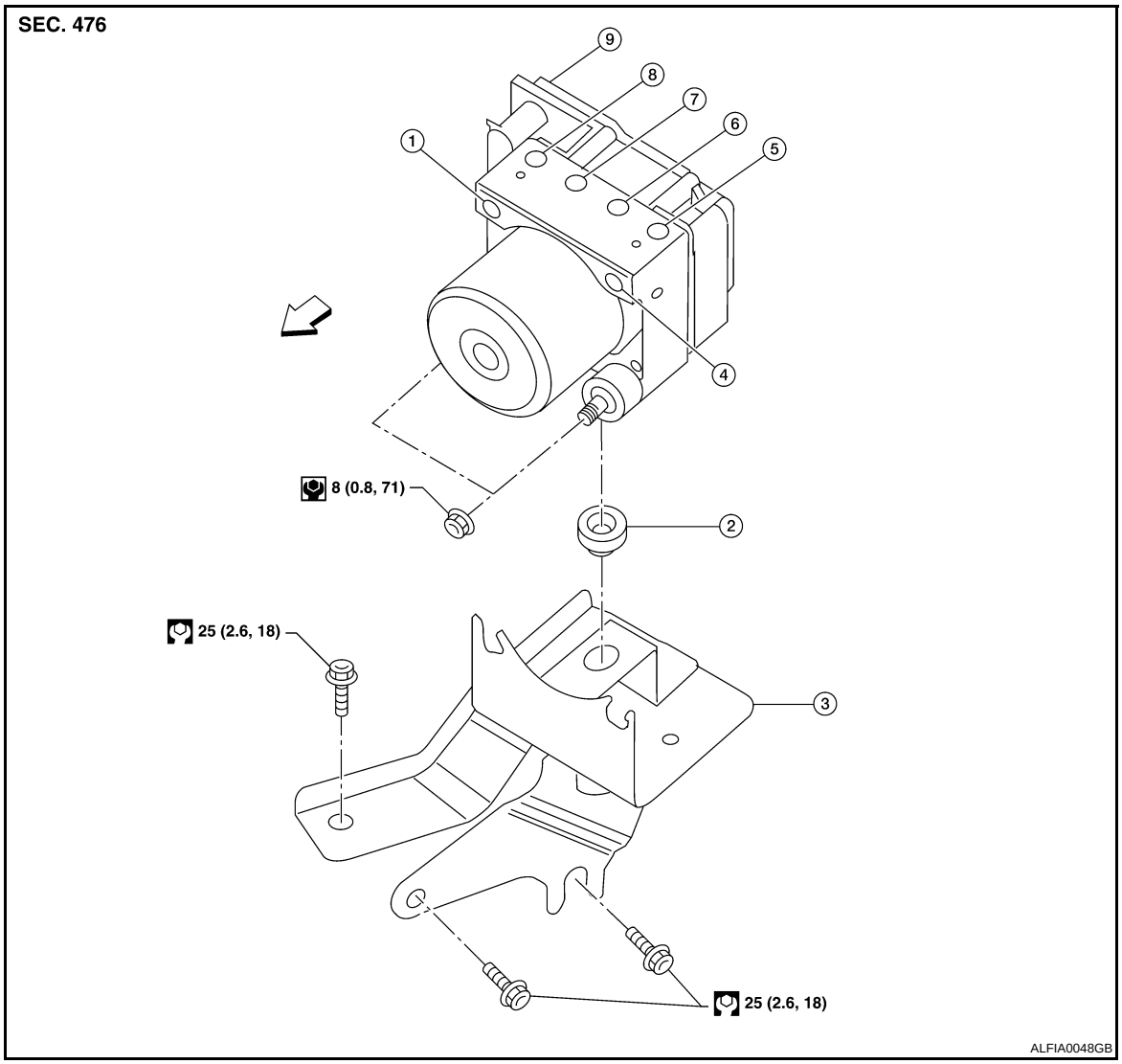
The front and rear wheel sensor rotors are an integral part of the wheel hub assemblies and can not be disassembled. When replacing the sensor rotor, replace the wheel hub assembly. Refer to FAX-7, "Removal and Installation" (Front), RAX-6, "Removal and Installation" (Rear).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:0000000000992732

COMPONENT



1. From master cylinder secondary side
2. Grommet
3. Bracket
4. From master cylinder primary side
5. To front LH brake caliper
6. To rear RH brake caliper
7. To rear LH brake caliper
8. To front RH brake caliper
9. ABS actuator and electric unit

⇐ Front

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

Removal and Installation

INFOID:0000000000992733

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".**

1. Remove front wiper arms. Refer to WW-35, "FRONT WIPER ARMS : Removal and Installation".
2. Remove cowl top. Refer to EXT-17, "Removal and Installation".
3. Disconnect washer hose.
4. Remove tower bar, if equipped. Refer to FSU-13, "Exploded View".
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.

INSTALLATION

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".**
- **After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked.**

Installation is the reverse order of removal.

G SENSOR

Removal and Installation

INFOID:0000000000992734

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.**

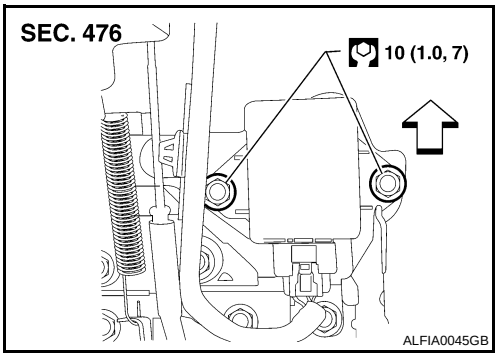
1. Remove center console. Refer to IP-16, "Exploded View".
2. Disconnect yaw rate/side G sensor harness connector.
3. Remove mounting nuts. Remove yaw rate/side G sensor.

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 the reverse order of removal. Tighten to specifications.



STEERING ANGLE SENSOR

Removal and Installation

INFOID:0000000000992735

The steering angle sensor is part of the spiral cable assembly and should not be disassembled. When replacing steering angle sensor, replace the spiral cable assembly and steering angle sensor as a unit. Refer to SRS-6, "Removal and Installation".