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BRAKE CONTROL SYSTEM

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000007418738

1.COLLECT INFORMATION FROM THE CUSTOMER

Get 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-8, "Diagnostic Work Sheet".

>> GO TO 2.

2.PERFORM SELF DIAGNOSTIC RESULT

Perform self diagnostic result. Refer to BRC-15, "CONSULT Function (ABS)".

Are any DTCs displayed?

YES >> Refer to BRC-45, "DTC No. Index".
NO >> GO TO 3.

3.CHECK SYMPTOM OPERATING CONDITION

Check that the symptom is a normal operating condition. Refer to BRC-60, "Description".

Is the symptom a normal operating condition?

YES >> Inspection End.
NO >> GO TO 4.

4.CHECK WARNING LAMPS OPERATION

Check warning lamps operation.
- ABS warning lamp: Refer to BRC-42, "Description".
- brake warning lamp: Refer to BRC-43, "Description".

Is ON/OFF timing normal?

YES >> GO TO 5.
NO >> Perform warning lamp diagnosis. Refer to BRC-42, "Component Function Check" (ABS warning lamp) or BRC-43, "Component Function Check" (brake warning lamp).

5.PERFORM DIAGNOSIS APPLICABLE TO THE SYMPTOM

Perform diagnosis applicable to the symptom. Refer to BRC-54, "Symptom Table".

>> GO TO 6.

6.FINAL CHECK

Perform self diagnostic result again, and check that the malfunction is repaired. After checking, erase the self diagnosis memory. Refer to BRC-15, "CONSULT Function (ABS)".

>> Inspection End.

Diagnostic Work Sheet

INFOID:0000000007418739

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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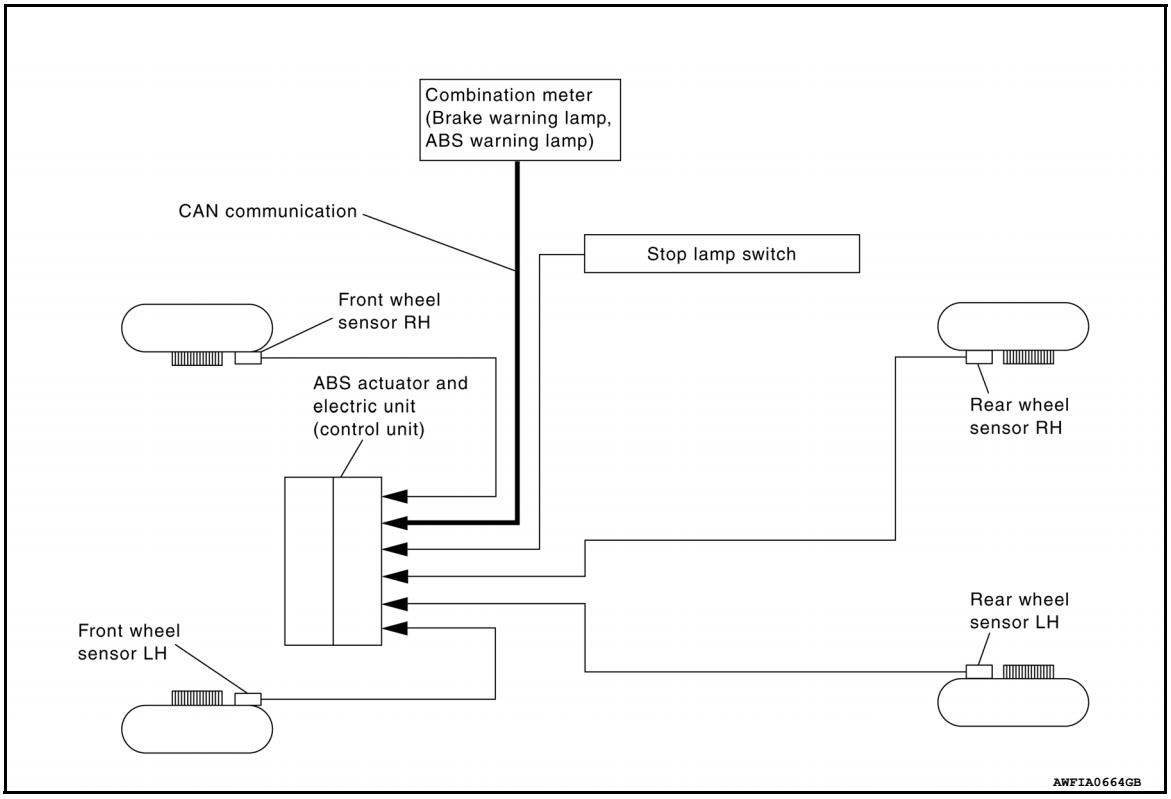
SYSTEM DESCRIPTION

ABS

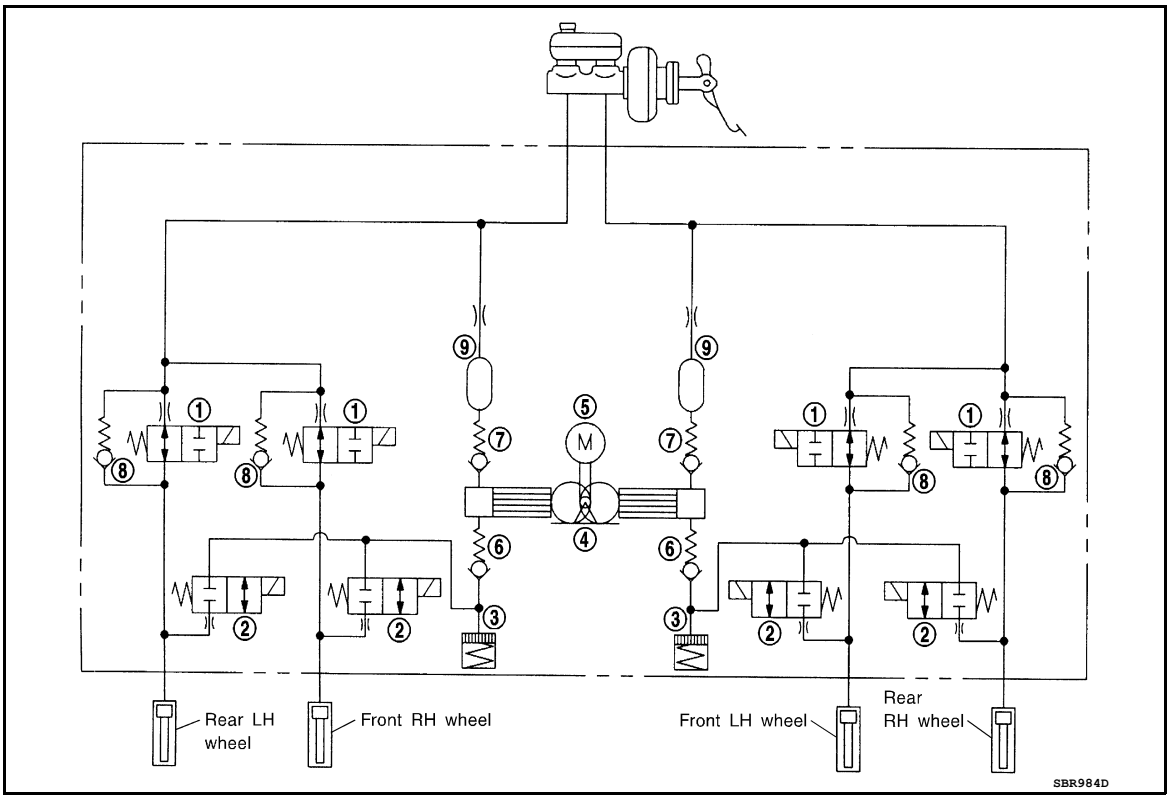
System Diagram

INFOID:0000000007418740



Hydraulic Circuit Diagram

INFOID:0000000007418741



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

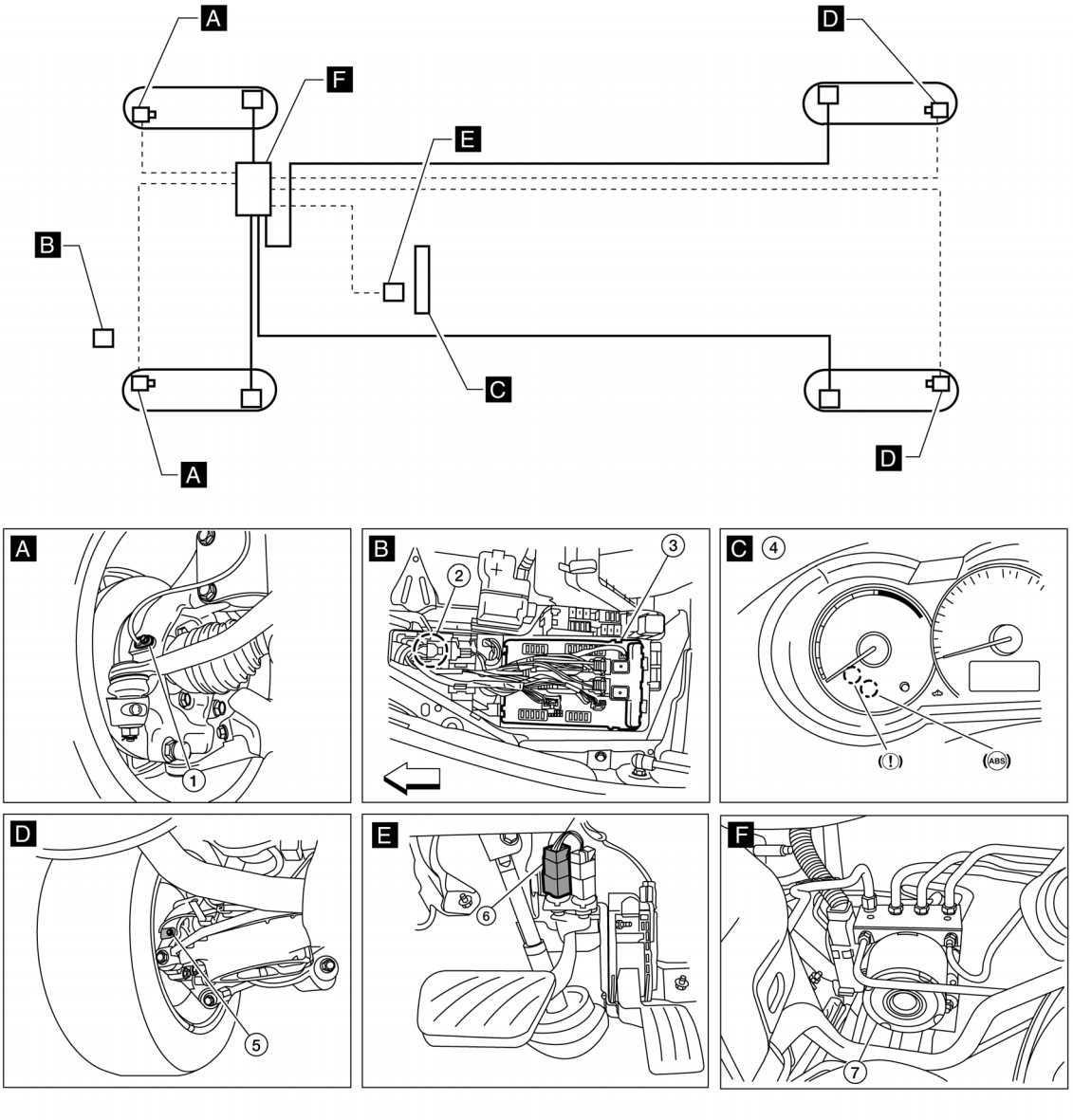
System Description

INFOID:0000000007418742

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

Component Parts Location

INFOID:0000000007418743



1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. Stop lamp relay-1 E57
3. IPDM E/R

4. Combination meter M24
5. Rear wheel sensor LH C2
   Rear wheel sensor RH C3
6. Stop lamp switch E38
7. ABS actuator and electric unit (control unit) E26

Component Description

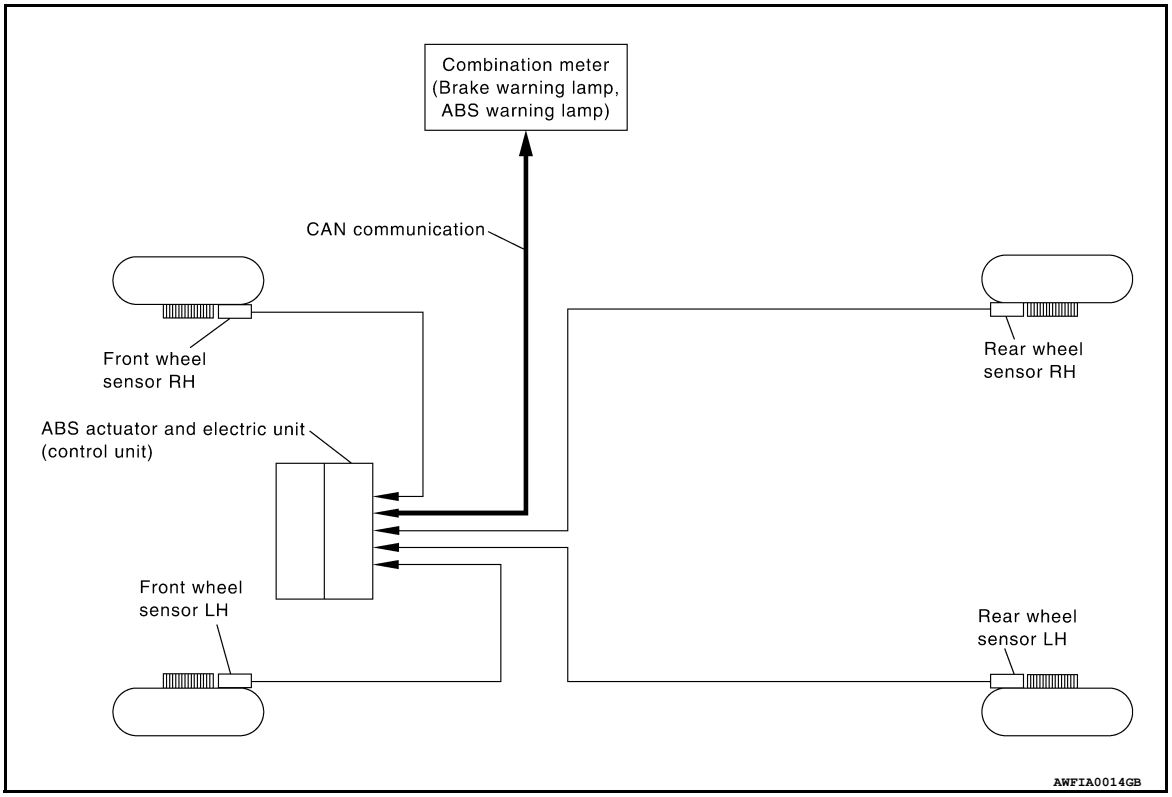
INFOID:0000000007418744

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-27, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-29, "Description"
	Solenoid valve	BRC-34, "Description"
Wheel sensor		BRC-18, "Description"
Stop lamp switch		BRC-39, "Description"
ABS warning lamp		BRC-42, "Description"
Brake warning lamp		BRC-43, "Description"

EBD

System Diagram

INFOID:0000000007418745



System Description

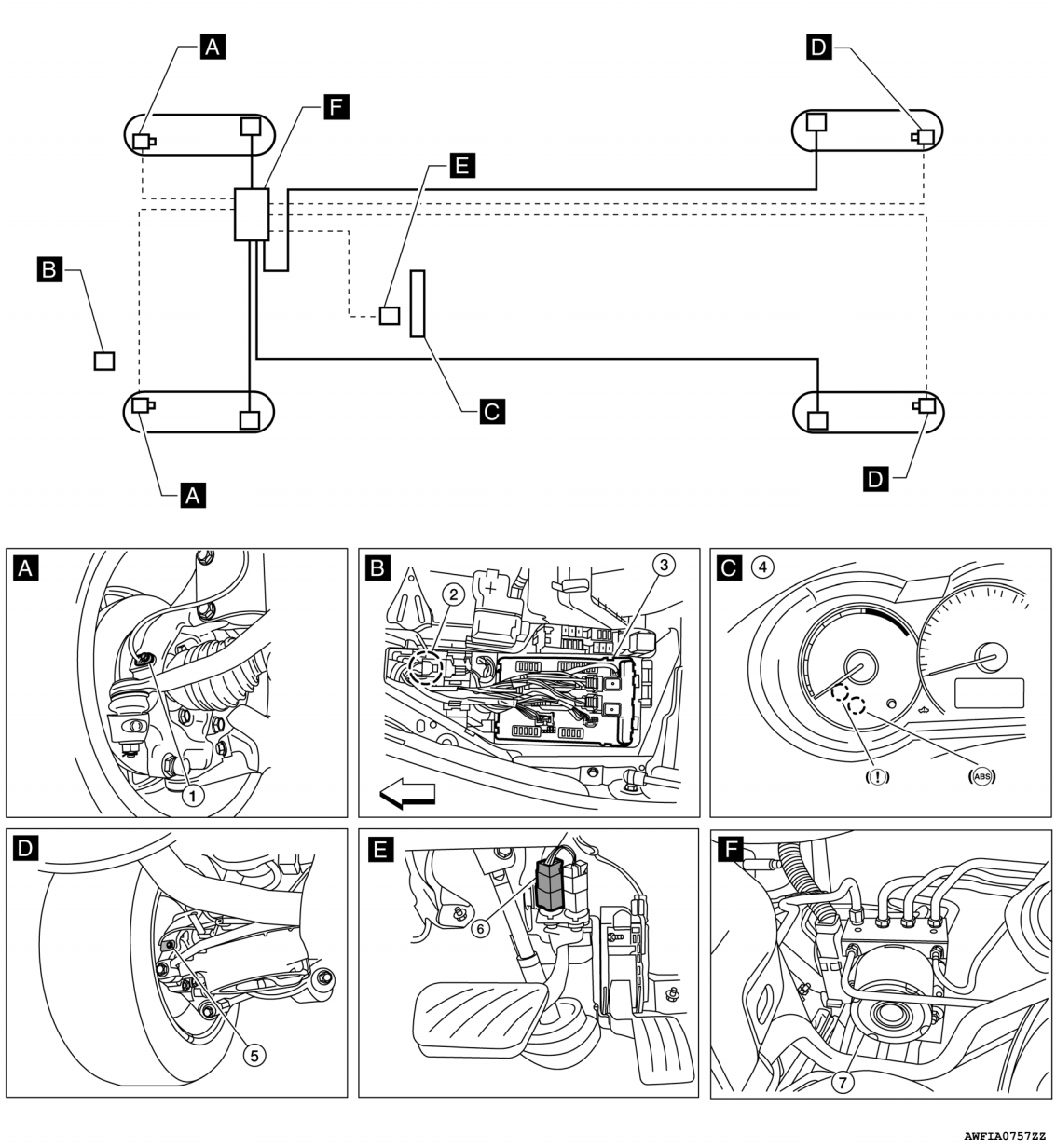
INFOID:0000000007418746

Electric Brake force Distribution functions as follows:

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

Component Parts Location

INFOID:0000000007418747



1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. Stop lamp relay-1 E57
3. IPDM E/R
4. Combination meter M24
5. Rear wheel sensor LH C2
   Rear wheel sensor RH C3
6. Stop lamp switch E38
7. ABS actuator and electric unit (control unit) E26

Component Description

INFOID:0000000007418748

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-27, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-29, "Description"
	Solenoid valve	BRC-34, "Description"

Component parts	Reference
Wheel sensor	BRC-18, "Description"
Stop lamp switch	BRC-39, "Description"
ABS warning lamp	BRC-42, "Description"
Brake warning lamp	BRC-43, "Description"

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

CONSULT Function (ABS)

INFOID:0000000007418749

FUNCTION

CONSULT 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.
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 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 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 DIAGNOSTIC RESULT

Operation Procedure

1. Turn ignition switch OFF.
2. Connect CONSULT 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 screen.
6. The self-diagnostic results are displayed.
   • Check ABS warning lamp. If “NO FAILURE” is displayed. Refer to BRC-42, "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 screen to erase the diagnostic memory.
   If “ABS” is not indicated, go to GI-50, "Description".
   CAUTION:
   If the diagnostic memory is not erased, re-perform the operation from step 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

Refer to BRC-45, "DTC No. Index".

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 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.
- 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.

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:0000000007418750

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:0000000007418751

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 DIAGNOSTIC RESULT

With CONSULT.

1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self diagnostic result.

Is DTC C1101, C1102, C1103 or C1104 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-18, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418752

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace wheel sensor. Refer to BRC-64, "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-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-7, "Removal and Installation" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1	—	No
2		

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair the circuit.

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E26	16	E19	1	Yes
		5		2	
Front RH		9	E41	1	
		10		2	
Rear LH		6	C2	1	
		17		2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000007418753

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-18, "Diagnosis Procedure".

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

INFOID:0000000007418754

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:0000000007418755

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self diagnostic result.

Is DTC C1105, C1106, C1107 or C1108 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-21, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418756

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

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

3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.
NOTE:
If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace wheel sensor. Refer to BRC-64, "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-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-7, "Removal and Installation" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1	—	No
2		

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair the circuit.

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E26	16	E19	1	Yes
		5		2	
Front RH		9	E41	1	
		10		2	
Rear LH		6	C2	1	
		17		2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000007418757

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-21, "Diagnosis Procedure".

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

Description

INFOID:0000000007418758

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

DTC Logic

INFOID:0000000007418759

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1109 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-24, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418760

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-15, "CONSULT Function (ABS)".

Is DTC 1109 detected?

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

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

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Turn ignition switch ON.
4. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 18 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx)
Connector	Terminal			
E26	18	—	Ignition switch ON	Battery voltage
			Ignition switch OFF	0V

5. Turn ignition switch OFF.
6. Check continuity between ABS actuator and electric unit (control unit) connector E26 terminals 1, 4 and ground.

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

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

NO >> Repair or replace malfunctioning components.

DTC C1110 CONTROL FAILURE

DTC Logic

INFOID:0000000007418761

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1110 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-26, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418762

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). Refer to BRC-67, "Removal and Installation".

DTC C1111 PUMP MOTOR

Description

INFOID:0000000007418763

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:0000000007418764

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 DIAGNOSTIC RESULT

With CONSULT.

1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1111 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-27, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418765

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-15, "CONSULT Function (ABS)".

Is DTC C1111 detected?

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

2. CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	2	—	Battery voltage

Is the inspection result normal?

YES >> GO TO 3
NO >> Repair or replace malfunctioning components.

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

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000007418766

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 C1114 MAIN RELAY

Description

INFOID:0000000007418767

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

DTC Logic

INFOID:0000000007418768

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1114 detected?

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

Diagnosis Procedure

INFOID:0000000007418769

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-15, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

YES >> GO TO 3
NO >> Repair or replace malfunctioning components.

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000007418770

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:0000000007418771

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:0000000007418772

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 DIAGNOSTIC RESULT

With CONSULT.

1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self diagnostic result.

Is DTC C1115 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-31, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418773

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
2. Turn on the ABS active wheel sensor tester power switch.
   NOTE:
   The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.
3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.
   NOTE:
   If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace wheel sensor. Refer to BRC-64, "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-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-7, "Removal and Installation" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1	—	No
2		

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair the circuit.

6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E26	16	E19	1	Yes
		5		2	
Front RH		9	E41	1	
		10		2	
Rear LH		6	C2	1	
		17		2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000007418774

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-31, "Diagnosis Procedure".

C1120, C1122, C1124, C1126 IN ABS SOL

Description

INFOID:0000000007418775

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:0000000007418776

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1120, C1122, C1124 or C1126 detected?

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

Diagnosis Procedure

INFOID:0000000007418777

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-15, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000007418778

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".

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

INFOID:0000000007418779

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:0000000007418780

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1121, C1123, C1125 or C1127 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-36, "DTC Logic".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418781

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-15, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000007418782

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-36, "Diagnosis Procedure".

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000007418783

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:0000000007418784

DTC DETECTION LOGIC

DTC	Display	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 system malfunction

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC U1000 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-38, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418785

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self diagnostic result. Refer to BRC-15, "CONSULT Function (ABS)".

Is DTC U1000 detected?

YES >> Refer to LAN-15, "Trouble Diagnosis Flow Chart".
NO >> Inspection End.

STOP LAMP SWITCH

Description

INFOID:0000000007418786

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit) either directly (with M/T) or through the stop lamp relay (with CVT).

Component Function Check

INFOID:0000000007418787

1.CHECK DATA MONITOR

On “DATA MONITOR”, select “STOP LAMP SW” and check the stop lamp switch signal.

Condition	STOP LAMP SW (DATA MONITOR)
Brake pedal depressed.	On
Brake pedal released.	Off

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to BRC-39, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007418788

Regarding Wiring Diagram information, refer to BRC-47, "Wiring Diagram - ABS".

1.CHECK STOP LAMP SWITCH

Perform the stop lamp switch component inspection. Refer to BRC-41, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES (with CVT)>>GO TO 2
YES (with M/T)>>GO TO 7
NO >> Replace stop lamp switch.

2.CHECK STOP LAMP RELAY-1

Perform the stop lamp relay-1 component inspection. Refer to BRC-41, "Component Inspection (Stop Lamp Relay)".

Is the inspection result normal?

YES >> GO TO 3
NO >> Replace stop lamp relay-1.

3.CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

1. Connect stop lamp switch and stop lamp relay-1 connectors.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E26	20	—	Brake pedal depressed	Battery voltage
			Brake pedal released	0V

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".

NO >> GO TO 4

4.CHECK STOP LAMP RELAY-1 COIL CIRCUIT

1. Disconnect stop lamp relay-1 connector.
2. Check voltage between stop lamp relay-1 connector E57 terminal 1 and ground.

Stop lamp relay-1		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E57	1	—	Brake pedal depressed	Battery voltage
			Brake pedal released	0V

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair circuit between stop lamp switch and stop lamp relay or circuit between fuse block J/B and stop lamp switch.

5.CHECK STOP LAMP RELAY-1 SWITCH INPUT CIRCUIT

Check voltage between stop lamp relay-1 connector E57 terminal 5 and ground.

Stop lamp relay-1		Ground	Voltage (Approx.)
Connector	Terminal		
E57	5	—	Battery voltage

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair circuit between fuse block J/B and stop lamp relay.

6.CHECK STOP LAMP RELAY-1 GROUND CIRCUIT

Check continuity between stop lamp relay-1 connector E57 terminal 2 and ground.

Stop lamp relay-1		Ground	Continuity
Connector	Terminal		
E57	2	—	Yes

Is the inspection result normal?

YES >> Repair circuit between stop lamp relay and ABS actuator and electric unit (control unit).
NO >> Repair stop lamp relay ground circuit.

7.CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E26	20	—	Brake pedal depressed	Battery voltage
			Brake pedal released	0V

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".
NO >> GO TO 8

8.CHECK STOP LAMP SWITCH INPUT CIRCUIT

1. Disconnect stop lamp switch connector.
2. Check voltage between stop lamp switch connector E38 terminal 1 and ground.

Stop lamp switch		Ground	Voltage (Approx.)
Connector	Terminal		
E38	1	—	Battery voltage

Is the inspection result normal?

YES >> Repair circuit between stop lamp switch and ABS actuator and electric unit (control unit).
NO >> Repair circuit between fuse block J/B and stop lamp switch.

Component Inspection (Stop Lamp Switch)

INFOID:0000000007418789

1.CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch connector.
3. Check continuity between stop lamp switch terminals.

Stop lamp switch terminals	Condition	Continuity
1 – 2	Brake pedal depressed.	Yes
	Brake pedal released.	No

Is the inspection result normal?

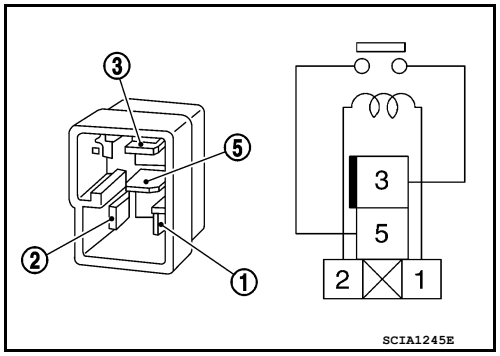
YES >> Inspection End.
NO >> Replace stop lamp switch.

Component Inspection (Stop Lamp Relay)

INFOID:0000000007418790

1.CHECK STOP LAMP RELAY

1. Turn ignition switch OFF.
2. Disconnect stop lamp relay connector.
3. Apply battery voltage to stop lamp relay terminal 1 and ground to terminal 2.
4. Check continuity between stop lamp relay terminals 3 and 5.



Stop lamp relay terminals	Condition	Continuity
3 – 5	Battery voltage applied to terminal 1 and ground to terminal 2	Yes
	Voltage and ground removed	No

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace stop lamp relay.

ABS WARNING LAMP

Description

INFOID:0000000007418791

×: ON –: OFF

Condition	ABS warning lamp
Ignition switch OFF	–
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	–
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000007418792

1.CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

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

Diagnosis Procedure

INFOID:0000000007418793

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-15, "CONSULT 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-4, "Work Flow".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-139, "Removal and Installation".

BRAKE WARNING LAMP

Description

INFOID:0000000007418794

×: ON –: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	–
Ignition switch ON	× (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:0000000007418795

1.BRAKE WARNING LAMP OPERATION CHECK 1

Check that the lamp illuminates after the ignition switch is turned ON, and turns OFF after the engine is started.

Is the inspection result normal?

YES >> GO TO 2
NO >> Go to diagnosis procedure. Refer to BRC-43, "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 BR-13, "Inspection and Adjustment".

Diagnosis Procedure

INFOID:0000000007418796

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 BR-13, "Inspection and Adjustment".

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-15, "CONSULT 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-4, "Work Flow".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-67, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-139, "Removal and Installation".

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000007418797

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	CVT 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 LH IN SOL FR LH OUT SOL FR RH IN SOL FR RH OUT SOL RR LH IN SOL RR LH OUT SOL RR RH IN SOL RR RH OUT SOL	Operation status of all solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) 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-15, "CONSULT Function (ABS)".

Fail-Safe

INFOID:0000000007418798

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:0000000007418799

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-18, "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-21, "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-24, "Diagnosis Procedure"
CONTROLLER FAILURE [C1110]*2	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-26, "Diagnosis Procedure"

Display item	Malfunction detecting condition	Check item
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-27, "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-29, "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-31, "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-34, "Diagnosis Procedure"
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-36, "Diagnosis Procedure"
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-34, "Diagnosis Procedure"
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-36, "Diagnosis Procedure"
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	BRC-34, "Diagnosis Procedure"
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-36, "Diagnosis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-34, "Diagnosis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-36, "Diagnosis Procedure"
CAN COMM CIRCUIT [U1000]*3	When there is a malfunction in the CAN communication circuit.	BRC-38, "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.

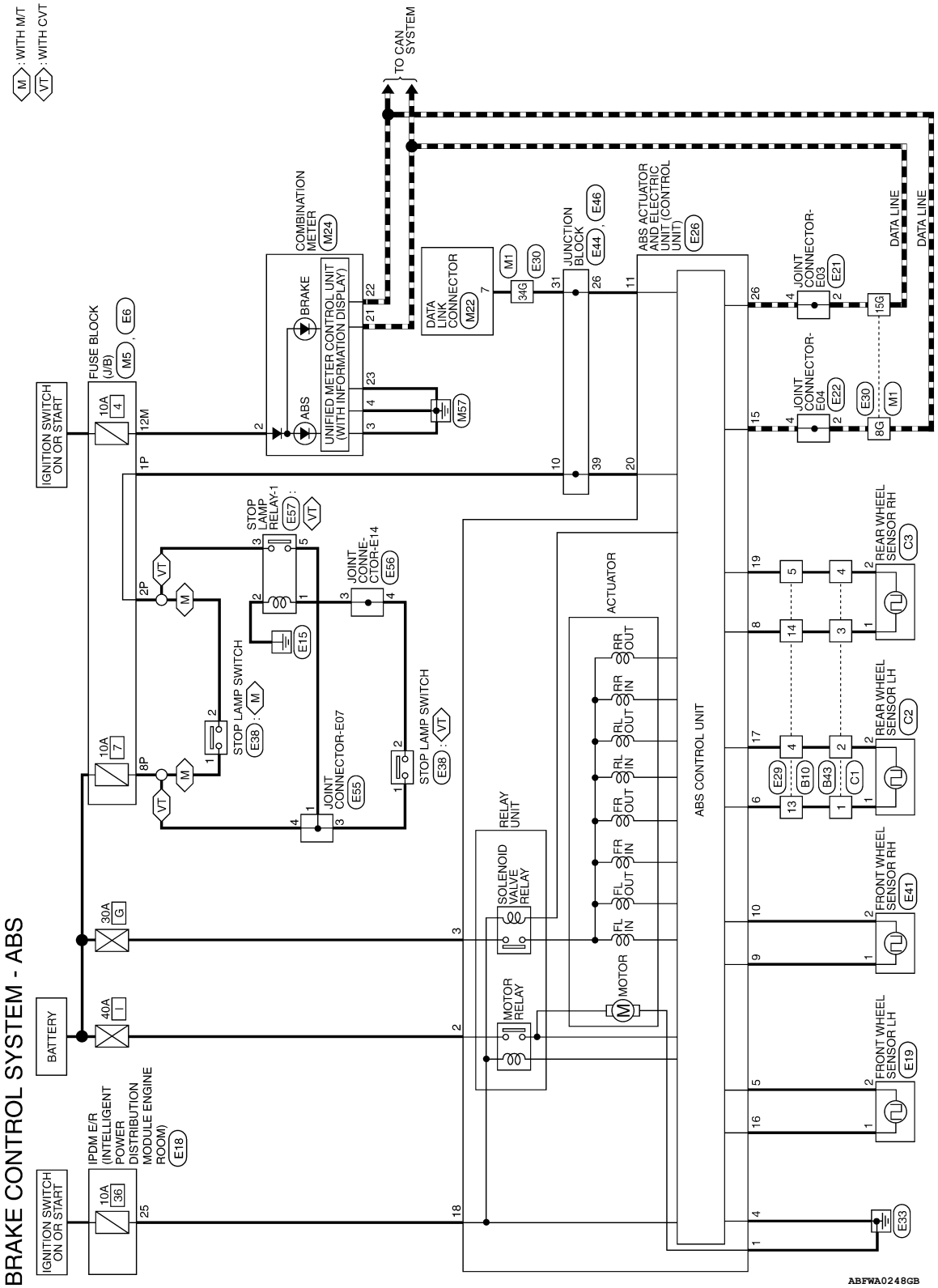
*3: When malfunctions are detected in several systems, including CAN communication circuit [U1000], troubleshoot CAN communication circuit first. Refer to LAN-6, "System Description".

WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram - ABS

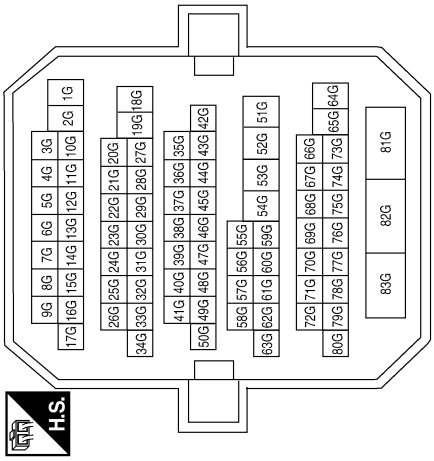
INFOID:0000000007418800



BRAKE CONTROL SYSTEM CONNECTORS - ABS

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

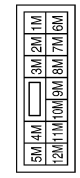
H.S.



Terminal No.	Color of Wire	Signal Name
8G	P	–
15G	L	–
34G	O	–

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

H.S.



Terminal No.	Color of Wire	Signal Name
12M	O	–

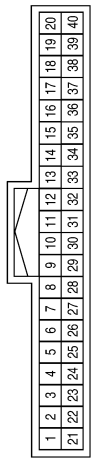
Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
7	O	–

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 (POWER)
4	B	GND (ILL)
21	L	CAN-H
22	P	CAN-L
23	B	GND (CIRCUIT)

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

H.S.

Terminal No.	Color of Wire	Signal Name
1P	SB	–
2P	LG	– (WITH MT)
2P	Y	– (WITH CVT)
8P	R	–

AAFIA0081GB

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

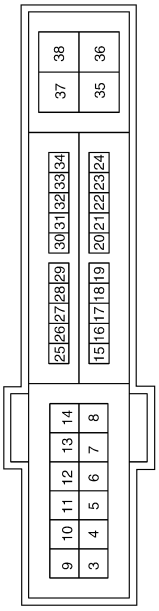
H.S.

Terminal No.	Color of Wire	Signal Name
1	W	–
2	V	–

Terminal No.	Color of Wire	Signal Name
25	GR	ABS_ECU

Connector No.	E18
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
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.	E21
Connector Name	JOINT CONNECTOR-E03
Connector Color	WHITE

H.S.

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

ABFIA0339GB

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	UB (MR)
3	R	UB (VR)
4	B	GND
5	V	DS FL
6	G	DP RL
7	–	–
8	L	DP RR
9	B	DP FR
10	LG	DS FR
11	GR	DIAG-K
12	–	–
13	–	–
14	–	–
15	P	CAN-L
16	W	DP FL
17	O	DS RL
18	GR	IGN
19	BR	DS RR
20	SB	BLS
21	–	–
22	–	–
23	–	–
24	–	–
25	–	–
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	O	–
5	BR	–
13	G	–
14	L	–

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	–

ABFIA0340GB

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	B	–
2	LG	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	R	–
2	LG	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	R	–
2	LG	–

Connector No.	E55
Connector Name	JOINT CONNECTOR-E07
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	W	–
3	R	–
4	R	–

Connector No.	E46
Connector Name	JUNCTION BLOCK
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
26	GR	–
31	O	–
39	SB	–

Connector No.	E44
Connector Name	JUNCTION BLOCK
Connector Color	BROWN

H.S.

Terminal No.	Color of Wire	Signal Name
10	SB	–

AAFIA0082GB

Connector No.	E56
Connector Name	JOINT CONNECTOR-E14
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
3	LG	–
4	LG	–

Connector No.	E57
Connector Name	STOP LAMP RELAY-1
Connector Color	BLUE

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	B	–
3	Y	–
5	W	–

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–
3	LG	–
4	BR	–

Connector No.	C2
Connector Name	REAR WHEEL SENSOR LH
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–

Connector No.	C3
Connector Name	REAR WHEEL SENSOR RH
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	BR	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
4	O	–
5	BR	–
13	G	–
14	LG	–

AAFIA0083GB

Connector No.	B43
Connector Name	WIRE TO WIRE
Connector Color	GRAY

Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–
3	LG	–
4	BR	–

AAFIA0084GB

SYMPTOM DIAGNOSIS

ABS

Symptom Table

INFOID:0000000007418801

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

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-55, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-56, "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-57, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-58, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-59, "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:0000000007418802

1.CHECK START

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

Is the inspection result normal?

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

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles. Refer to front: FAX-6, "Inspection", Rear: RAX-6, "On-vehicle Service".

Is the inspection result normal?

YES >> GO TO 3
NO >> Repair or replace malfunctioning components.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following.
- Wheel sensor installation for damage.
- Sensor rotor installation for damage.
- Wheel sensor connector connection.
- Wheel sensor harness inspection.

Is the inspection result normal?

YES >> GO TO 4
NO >>
- Replace wheel sensor or sensor rotor. Refer to BRC-64, "Removal and Installation" or BRC-66, "Removal and Installation".
- Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Perform self-diagnosis. Refer to BRC-15, "CONSULT Function (ABS)".

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000007418803

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-13, "Inspection and Adjustment".

Is the stroke too big?

YES >> • Bleed air from brake tube and hose. Refer to BR-16, "Bleeding Brake System".
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: BR-13, "Inspection and Adjustment", brake booster: BR-9, "Inspection" and master cylinder: BR-10, "On Board Inspection".

NO >> GO TO 2

2.CHECK ABS FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000007418804

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

1.CHECK ABS FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000007418805

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

1.CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned on or when driving.

Is the inspection result normal?

YES >> Inspection End.
NO >> Perform self-diagnosis. Refer to BRC-15, "CONSULT Function (ABS)".

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000007418806

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 that there are pedal vibrations when the engine is started.

Do vibrations occur?

YES >> GO TO 2
NO >> Inspect the brake pedal.

2.SYMPTOM CHECK 2

Check that there are ABS operation noises when the engine is started.

Do the operation noises occur?

YES >> GO TO 3
NO >> Perform self diagnostic result. Refer to BRC-15, "CONSULT Function (ABS)".

3.SYMPTOM CHECK 3

Check symptoms when electrical component (headlamps, etc.) switches are operated.

Do symptoms occur?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.
NO >> Inspection End.

NORMAL OPERATING CONDITION

Description

INFOID:0000000007418807

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"

INFOID:0000000007418808

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

WARNING:

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

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

WARNING:

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

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000007418809

NOTE:

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

This vehicle is equipped with a push-button ignition switch and a steering lock unit.
If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

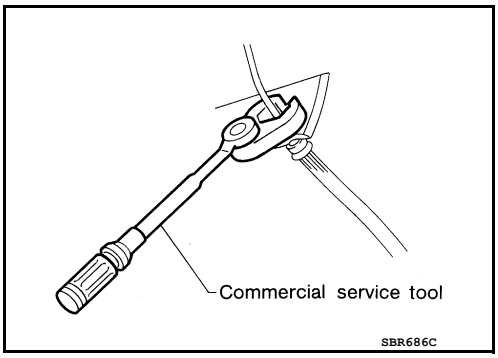
1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Brake System

INFOID:0000000007418810

- Recommended fluid is brake fluid “DOT 3”.
- Do not 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.
- Do not 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:0000000007418811

- 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.

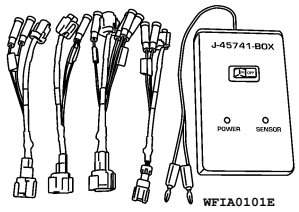
PREPARATION

PREPARATION

Special Service Tool

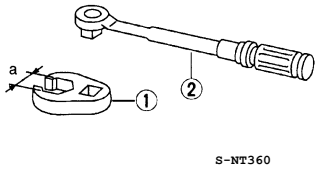
INFOID:0000000007418812

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 	Checking operation of ABS active wheel sensor

Commercial Service Tool

INFOID:0000000007418813

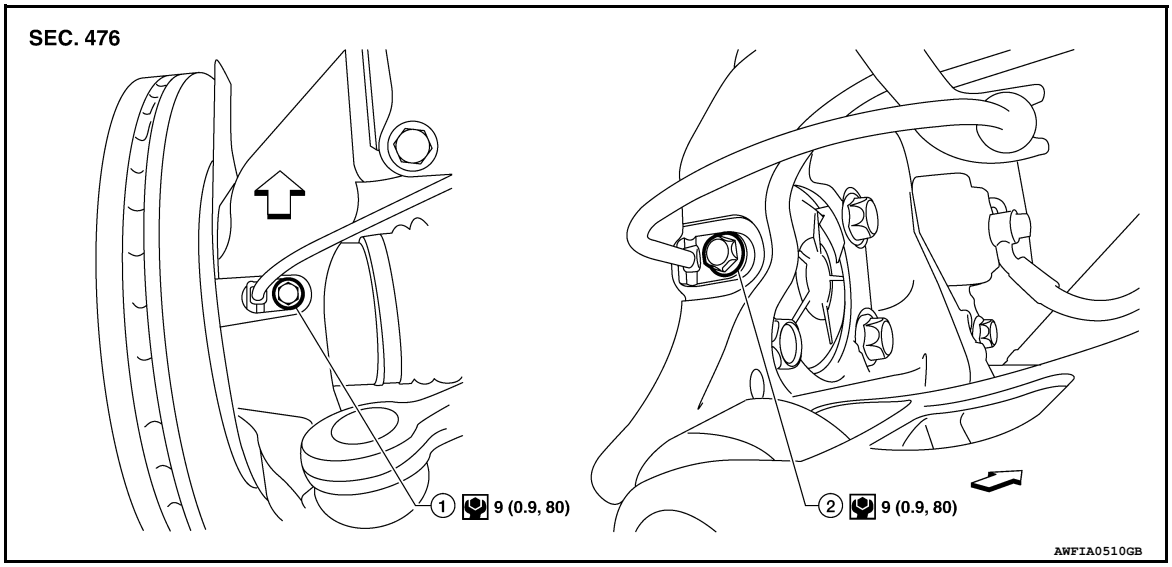
Tool name	Description
1. Flare nut crowfoot 2. Torque wrench 	Removing and installing brake piping **a: 10mm (0.39 in)/12mm (0.47 in)**

REMOVAL AND INSTALLATION

WHEEL SENSORS

Removal and Installation

INFOID:0000000007418814



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, first remove the wheel sensor from the wheel hub. Failure to do so may result in damage to the wheel sensor wires making the sensor inoperative.**
- **Pull out the wheel sensor, being careful to turn it as little as possible. Do not pull on the wheel sensor harness.**
- **Before installation, 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 in the wheel hub for the wheel sensor, or if a foreign object is caught in the surface of the mating surface for the sensor rotor. Fix as necessary and then install the wheel sensor.**

FRONT WHEEL SENSOR

Removal

1. Remove front wheel and tire. Refer to WT-68, "Adjustment".
2. Partially remove front wheel fender protector. Refer to EXT-22, "Removal and Installation" (Coupe), EXT-46, "Removal and Installation" (Sedan).
3. Remove wheel sensor bolt and wheel sensor.
4. Remove harness wire from mounts and disconnect wheel sensor harness connector.

Installation

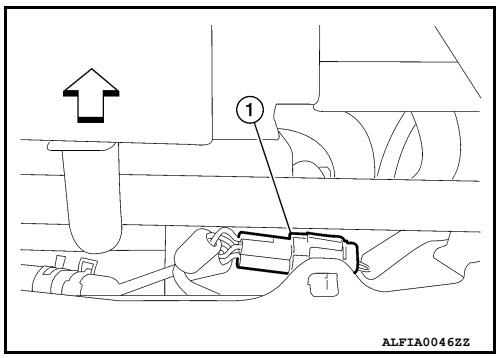
Installation is in the reverse order of removal.

REAR WHEEL SENSOR

Removal

1. Remove rear wheel and tire. Refer to WT-68, "Adjustment".

2. Disconnect wheel sensor harness connector (1).
   - ⇦: Front
3. Remove harness wire clips from rear suspension member.
4. Remove wheel sensor bolt and wheel sensor from rear wheel hub and bearing assembly.



Installation

Installation is in the reverse order of removal.

SENSOR ROTOR

Removal and Installation

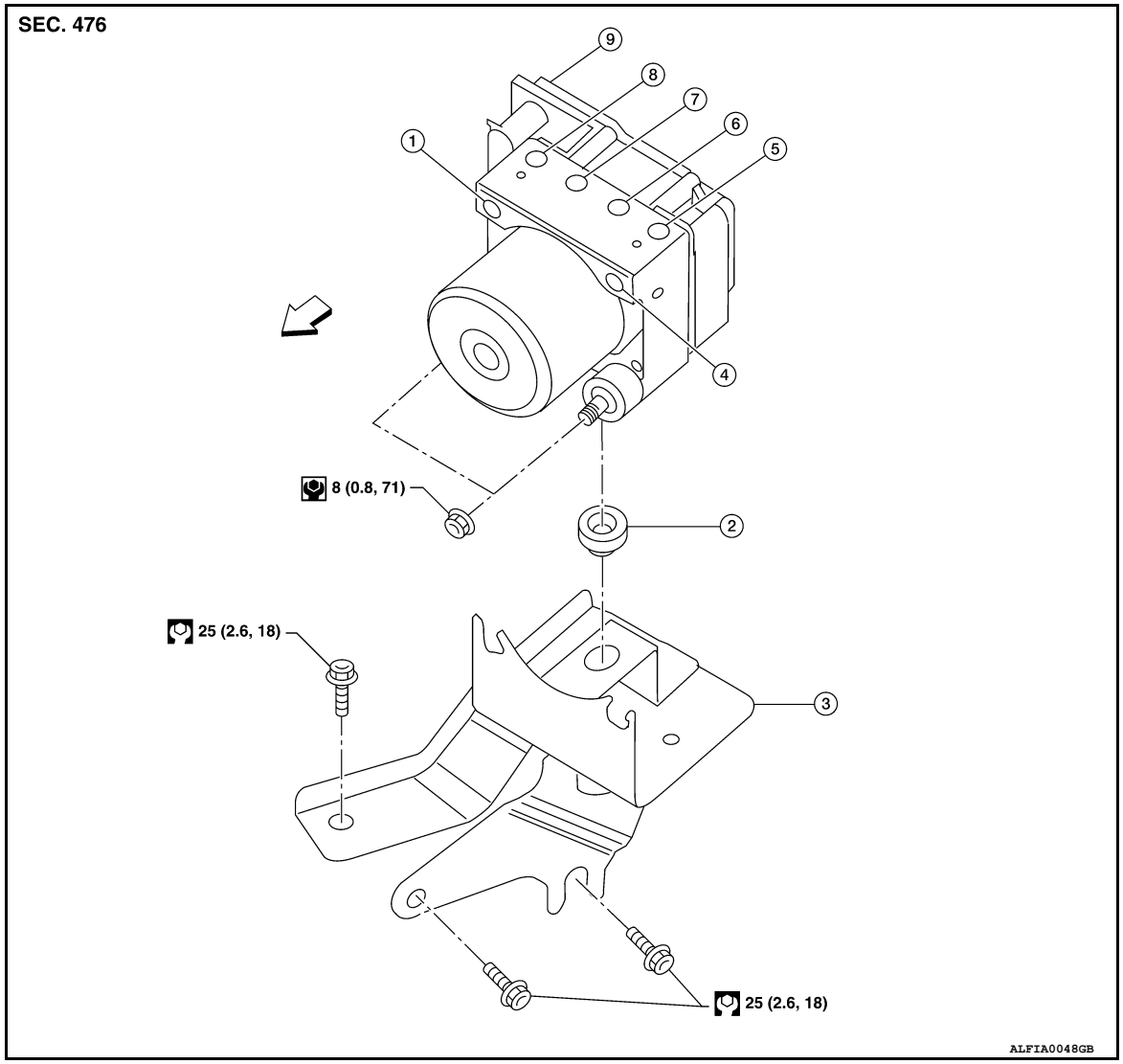
INFOID:0000000007418815

The front and rear wheel sensor rotors are an integral part of the wheel hubs and can not be disassembled. When replacing the sensor rotor, replace the wheel hub. Refer to FAX-8, "Removal and Installation" (front), RAX-7, "Removal and Installation" (rear).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:0000000007418816



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 (control unit)

⇦ Front

Removal and Installation

INFOID:0000000007418817

CAUTION:

Be careful of the following.

- **Before servicing, disconnect the battery cable from negative terminal.**
- **To remove brake pipe, use a suitable tool (flare nut wrench) to prevent flare nuts and brake tube from being damaged. To install, use suitable tool (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 ABS actuator and electric unit (control unit) by holding harness.**
- **After work is completed, bleed air from brake tube. Refer to BR-16, "Bleeding Brake System".**
- **After installing harness connector on the ABS actuator and electric unit (control unit), make sure connector is securely locked.**

REMOVAL

NOTE:
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Remove cowl top. Refer to EXT-21, "Removal and Installation" (Coupe), EXT-45, "Removal and Installation" (Sedan).
2. Disconnect washer hose.
3. Disconnect the battery negative terminal.
4. Remove strut tower bar, if equipped. Refer to FSU-14, "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) using a suitable tool.
7. Remove ABS actuator and electric unit (control unit) nuts.
8. Remove ABS actuator and electric unit (control unit).
9. Remove bracket as necessary.

INSTALLATION

Installation is in the reverse order of removal.
Torque brake lines to proper specifications. Refer to BR-18, "Hydraulic Circuit".

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000007418818

1.COLLECT INFORMATION FROM THE CUSTOMER

Get 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-70, "Diagnostic Work Sheet".

>> GO TO 2.

2.PERFORM SELF DIAGNOSTIC RESULT

Perform self diagnostic result. Refer to BRC-81, "CONSULT Function (ABS)".

Are any DTCs displayed?

YES >> Refer to BRC-115, "DTC No. Index".
NO >> GO TO 3.

3.CHECK SYMPTOM OPERATING CONDITION

Check that the symptom is a normal operating condition. Refer to BRC-131, "Description".

Is the symptom a normal operating condition?

YES >> Inspection End.
NO >> GO TO 4.

4.CHECK WARNING AND INDICATOR LAMPS OPERATION

Check warning and indicator lamps operation.
- ABS warning lamp: Refer to BRC-109, "Description".
- brake warning lamp: Refer to BRC-110, "Description".
- SLIP indicator lamp: Refer to BRC-113, "Description".

Is ON/OFF timing normal?

YES >> GO TO 5.
NO >> Perform warning lamp diagnosis. Refer to BRC-109, "Component Function Check" (ABS warning lamp), BRC-110, "Component Function Check" (brake warning lamp), or BRC-113, "Component Function Check" (SLIP indicator lamp).

5.PERFORM DIAGNOSIS APPLICABLE TO THE SYMPTOM

Perform diagnosis applicable to the symptom. Refer to BRC-124, "Symptom Table".

>> GO TO 6.

6.FINAL CHECK

Perform self diagnostic result again, and check that the malfunction is repaired. After checking, erase the self diagnosis memory. Refer to BRC-81, "CONSULT Function (ABS)".

>> Inspection End.

Diagnostic Work Sheet

INFOID:0000000007418819

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		

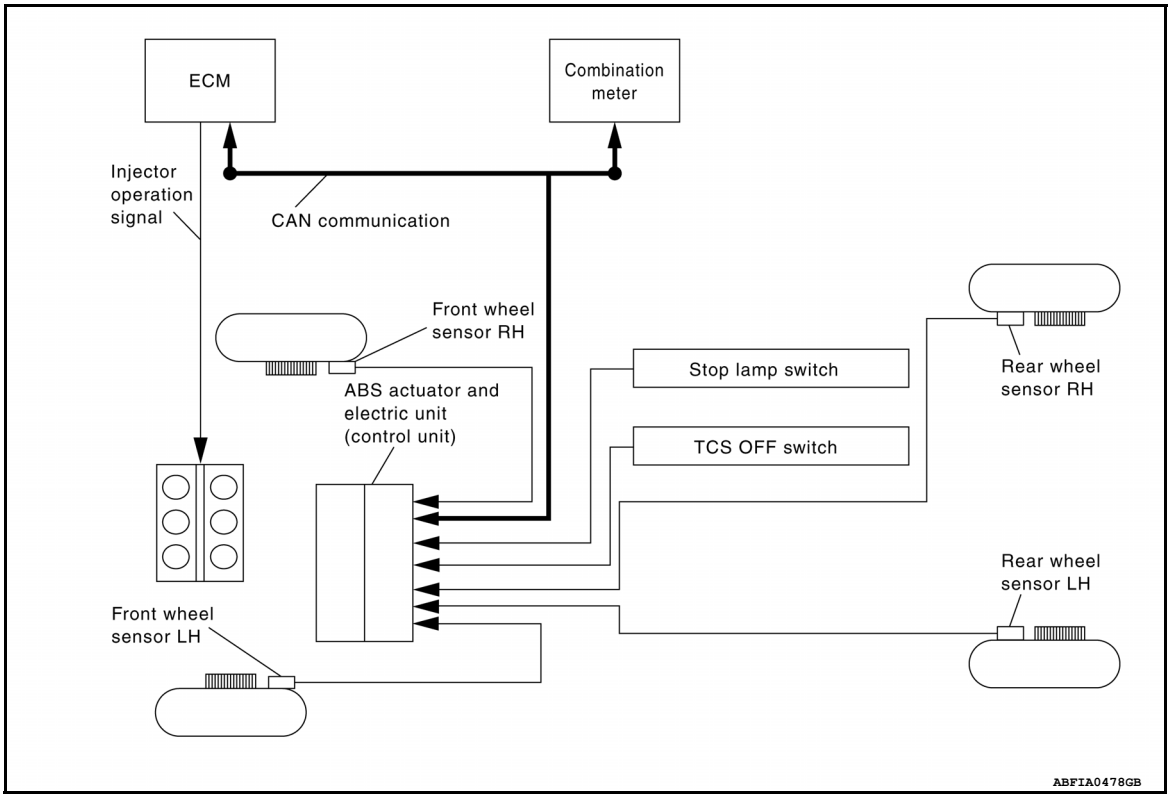
SFIA3265E

SYSTEM DESCRIPTION

TCS

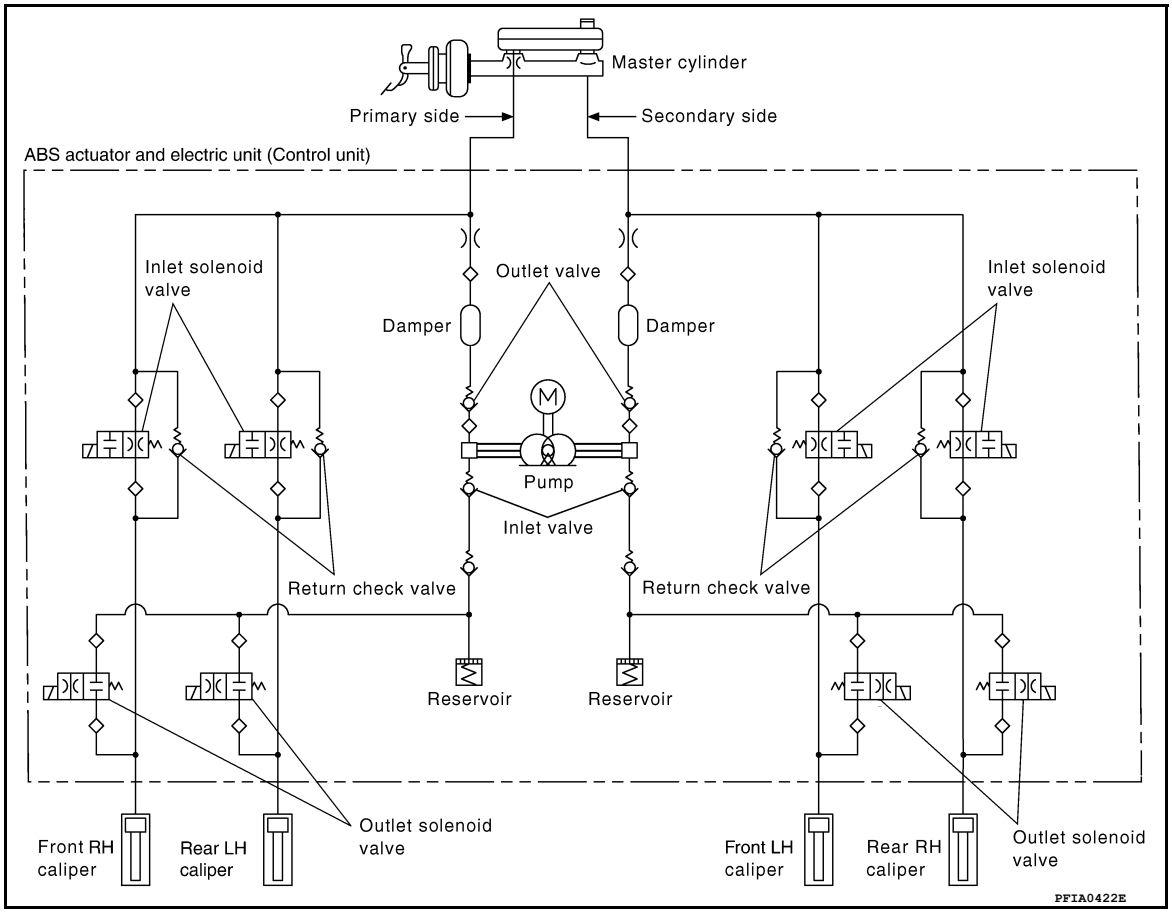
System Diagram

INFOID:0000000007418820



Hydraulic Circuit Diagram

INFOID:0000000007418821



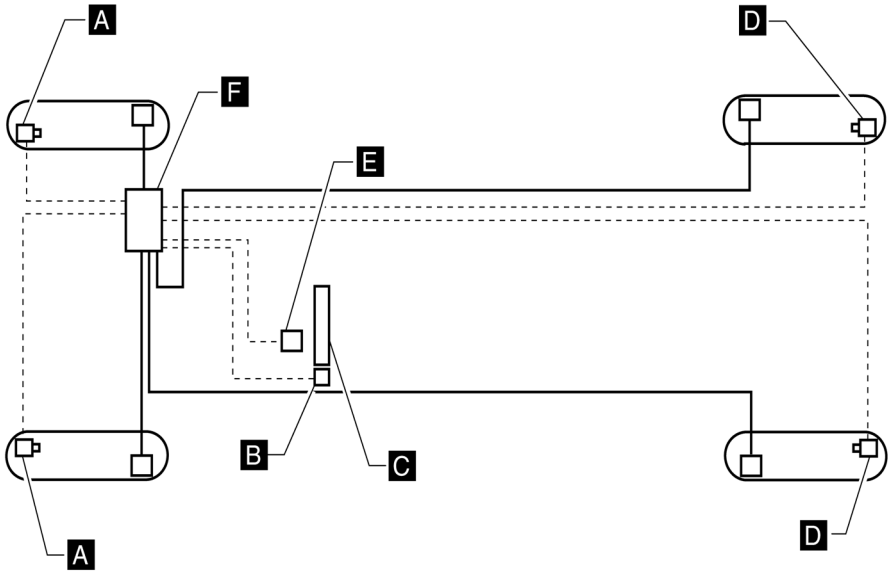
System Description

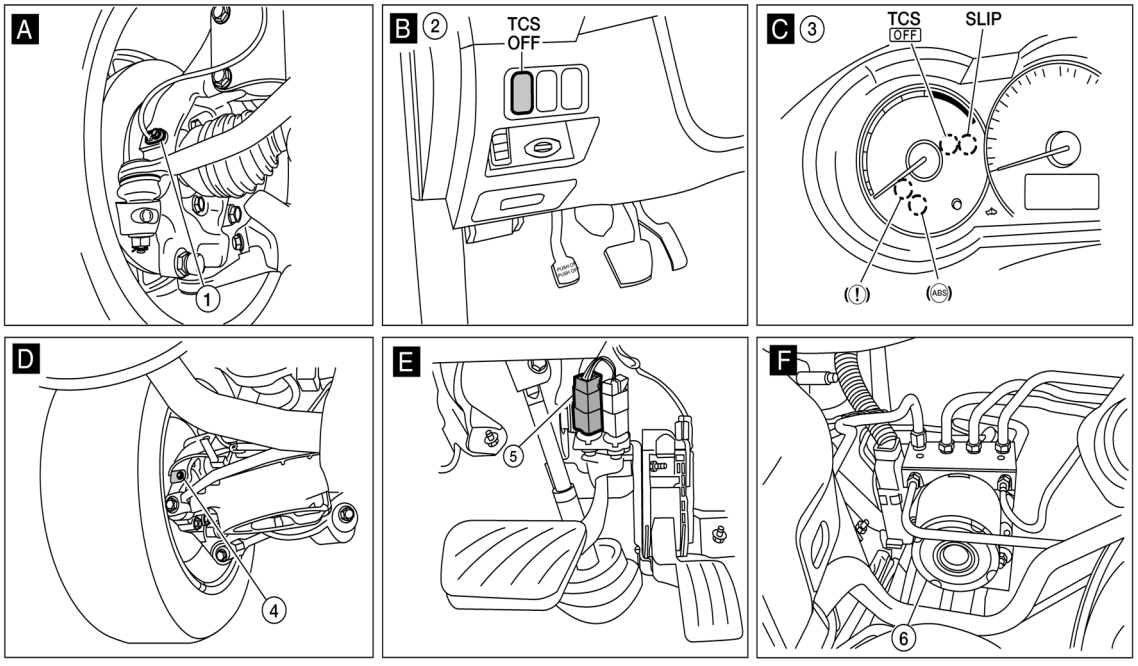
INFOID:0000000007418822

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

Component Parts Location

INFOID:0000000007418823





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1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. TCS OFF switch M72
3. Combination meter M24
4. Rear wheel sensor LH C2
   Rear wheel sensor RH C3
5. Stop lamp switch E38
6. ABS actuator and electric unit (control unit) E26

Component Description

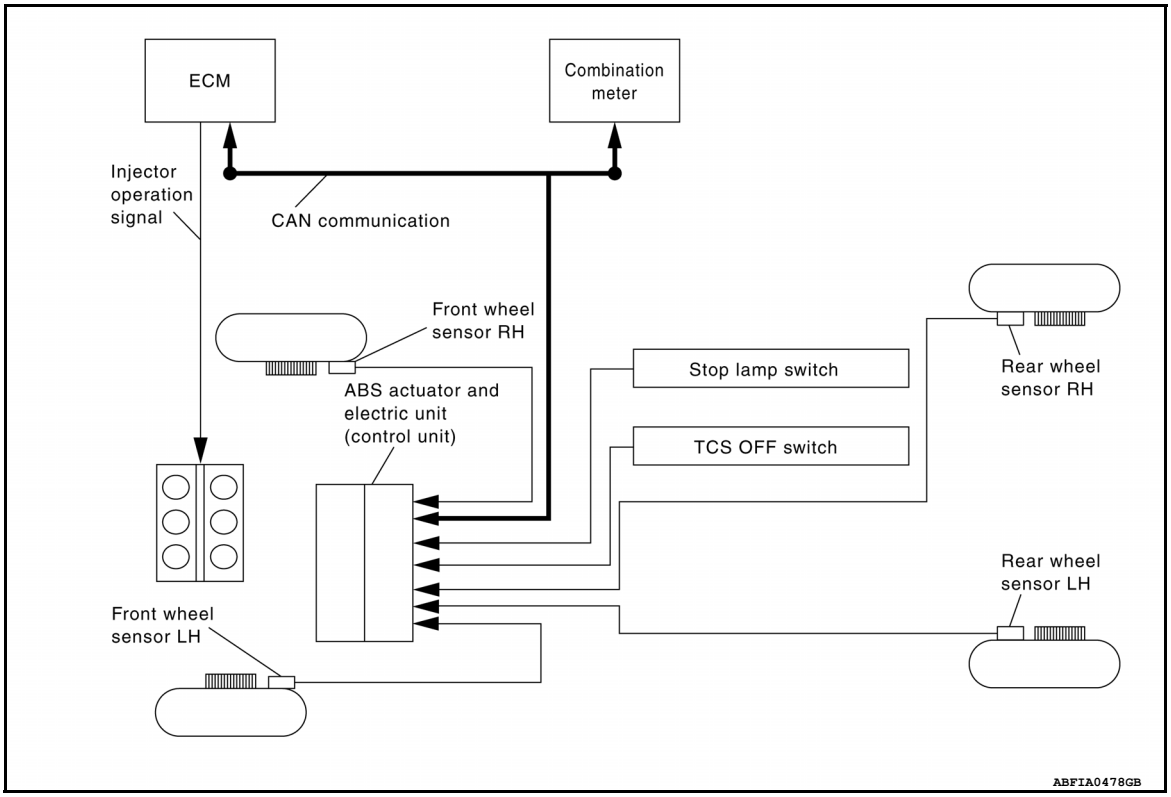
INFOID:0000000007418824

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-93, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-95, "Description"
	Solenoid valve	BRC-100, "Description"
Wheel sensor		BRC-84, "Description"
TCS OFF switch		BRC-111, "Description"
ABS warning lamp		BRC-109, "Description"
Brake warning lamp		BRC-110, "Description"
Slip indicator lamp		BRC-113, "Description"

ABS

System Diagram

INFOID:0000000007418825



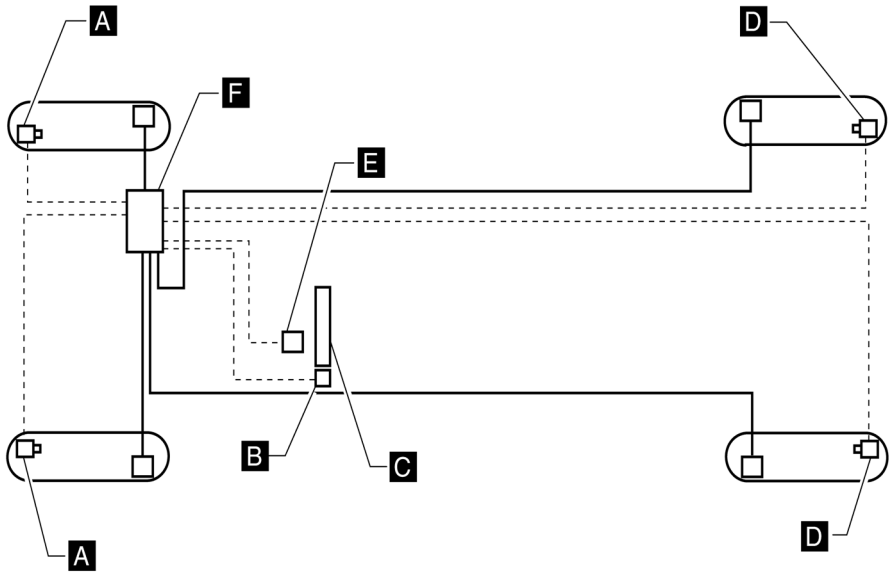
System Description

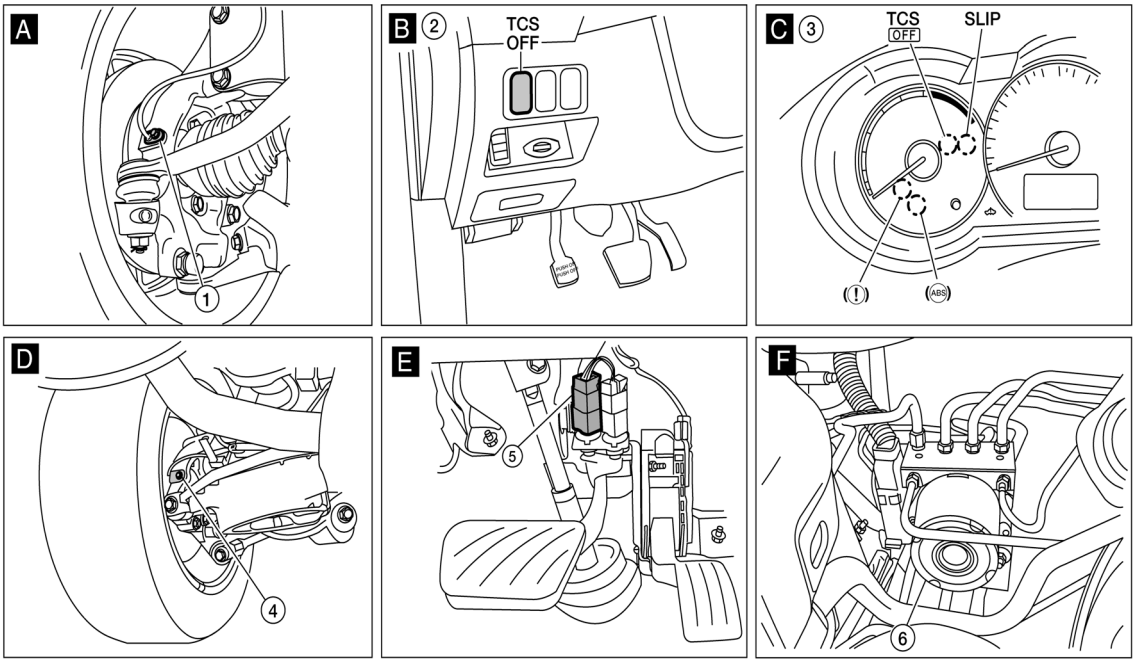
INFOID:0000000007418826

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

Component Parts Location

INFOID:0000000007418827





AWFIA0662ZZ

1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. TCS OFF switch M72
3. Combination meter M24
4. Rear wheel sensor LH C2
   Rear wheel sensor RH C3
5. Stop lamp switch E38
6. ABS actuator and electric unit (control unit) E26

Component Description

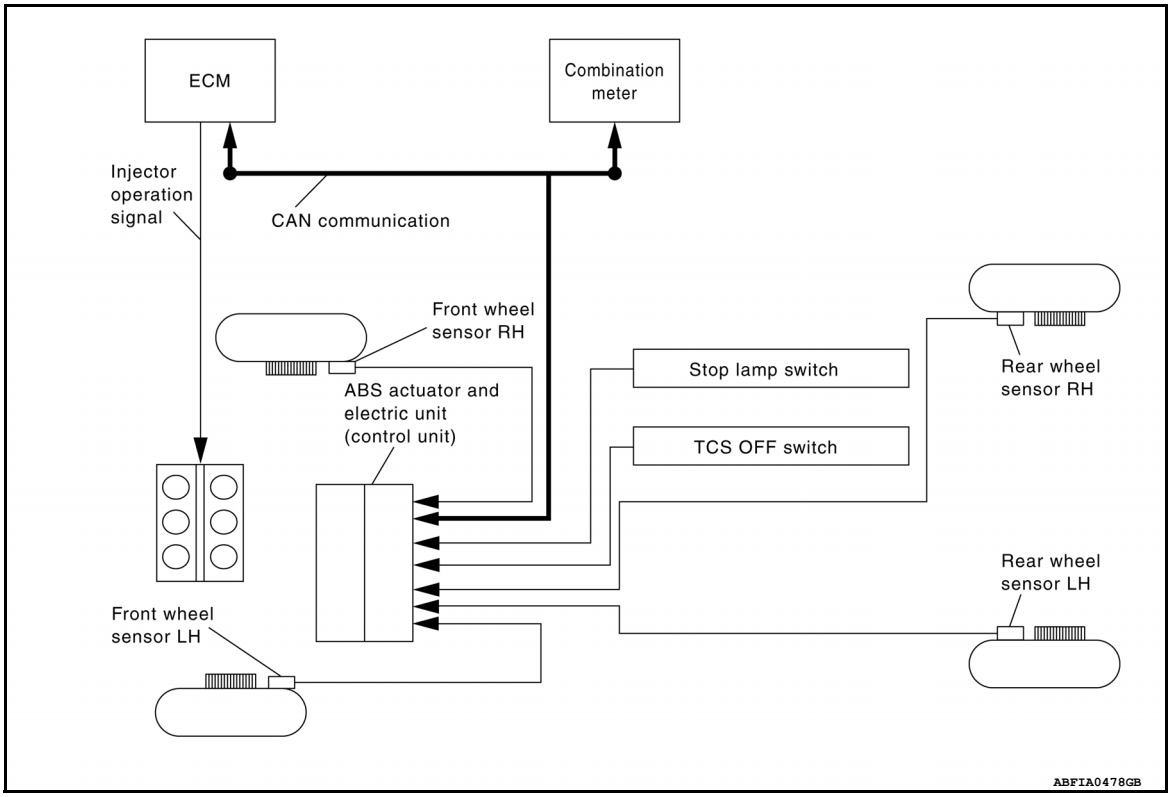
INFOID:0000000007418828

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-93, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-95, "Description"
	Solenoid valve	BRC-100, "Description"
Wheel sensor		BRC-84, "Description"
TCS OFF switch		BRC-111, "Description"
ABS warning lamp		BRC-109, "Description"
Brake warning lamp		BRC-110, "Description"
Slip indicator lamp		BRC-113, "Description"

EBD

System Diagram

INFOID:0000000007418829



System Description

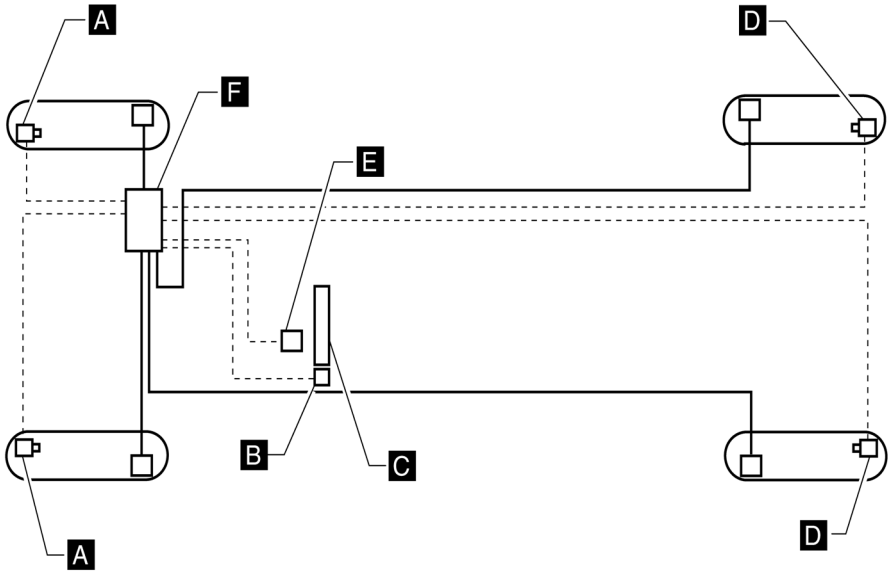
INFOID:0000000007418830

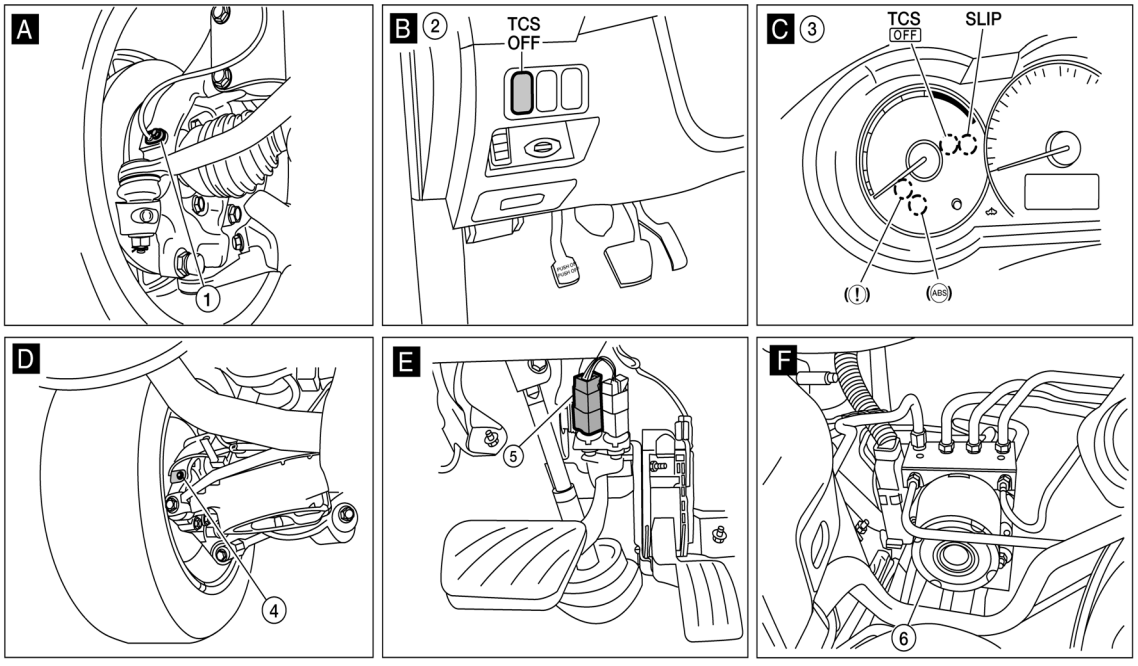
Electric Brake force Distribution functions as follows:

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

Component Parts Location

INFOID:0000000007418831





AWFIA0662ZZ

1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. TCS OFF switch M72
3. Combination meter M24
4. Rear wheel sensor LH C2
   Rear wheel sensor RH C3
5. Stop lamp switch E38
6. ABS actuator and electric unit (control unit) E26

Component Description

INFOID:0000000007418832

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-93, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-95, "Description"
	Solenoid valve	BRC-100, "Description"
Wheel sensor		BRC-84, "Description"
TCS OFF switch		BRC-111, "Description"
ABS warning lamp		BRC-109, "Description"
Brake warning lamp		BRC-110, "Description"
Slip indicator lamp		BRC-113, "Description"

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

CONSULT Function (ABS)

INFOID:0000000007418833

SELF DIAGNOSTIC RESULT

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 “ABS”, “SELF-DIAG RESULTS” in order on the CONSULT 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-109, "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 “ABS”, “SELF-DIAG RESULTS”, “ERASE MEMORY” in order on the CONSULT screen to erase the diagnostic memory.
   If “ABS” is not indicated, go to GI-50, "Description".
   CAUTION:
   If the diagnostic memory is not erased, re-perform the operation from step 6 above.
3. Perform self-diagnosis again, and make sure that diagnostic memory is erased.
4. Drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, TCS OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn off.

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
Refer to BRC-115, "DTC No. Index".

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.

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:0000000007418834

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:0000000007418835

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 DIAGNOSTIC RESULT

With CONSULT.

1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self diagnostic result.

Is DTC C1101, C1102, C1103 or C1104 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-84, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418836

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace wheel sensor. Refer to BRC-136, "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-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-7, "Removal and Installation" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1	—	No
2		

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair the circuit.

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E26	16	E19	1	Yes
		5		2	
Front RH		9	E41	1	
		10		2	
Rear LH		6	C2	1	
		17		2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000007418837

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-84, "Diagnosis Procedure".

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

INFOID:0000000007418838

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:0000000007418839

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 DIAGNOSTIC RESULT

With CONSULT.
1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self diagnostic result.

Is DTC C1105, C1106, C1107 or C1108 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-87, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418840

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
2. Turn on the ABS active wheel sensor tester power switch.
   NOTE:
   The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.
3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.
   NOTE:
   If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace wheel sensor. Refer to BRC-136, "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-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-7, "Removal and Installation" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1	—	No
2		

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair the circuit.

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E26	16	E19	1	Yes
		5		2	
Front RH		9	E41	1	
		10		2	
Rear LH		6	C2	1	
		17		2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000007418841

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-87, "Diagnosis Procedure".

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

Description

INFOID:0000000007418842

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

DTC Logic

INFOID:0000000007418843

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1109 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-90, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418844

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-81, "CONSULT Function (ABS)".

Is DTC 1109 detected?

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

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

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Turn ignition switch ON.
4. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 18 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx)
Connector	Terminal			
E26	18	—	Ignition switch ON	Battery voltage
			Ignition switch OFF	0V

5. Turn ignition switch OFF.

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

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

NO >> • 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:0000000007418845

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1110 detected?

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

Diagnosis Procedure

INFOID:0000000007418846

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). Refer to BRC-139, "Removal and Installation".

DTC C1111 PUMP MOTOR

Description

INFOID:0000000007418847

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:0000000007418848

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 DIAGNOSTIC RESULT

With CONSULT.

1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1111 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-93, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418849

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-81, "CONSULT Function (ABS)".

Is DTC C1111 detected?

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

2. CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	2	—	Battery voltage

Is the inspection result normal?

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

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

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000007418850

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-93, "Diagnosis Procedure".

DTC C1114 MAIN RELAY

Description

INFOID:0000000007418851

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

DTC Logic

INFOID:0000000007418852

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1114 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-95, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418853

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-15, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

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

Component Inspection

INFOID:0000000007418854

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-93, "Diagnosis Procedure".

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

Description

INFOID:0000000007418855

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:0000000007418856

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 DIAGNOSTIC RESULT

With CONSULT.

1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self diagnostic result.

Is DTC C1115 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-97, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418857

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
2. Turn on the ABS active wheel sensor tester power switch.
   NOTE:
   The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.
3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.
   NOTE:
   If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace wheel sensor. Refer to BRC-136, "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-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-7, "Removal and Installation" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1	—	No
2		

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair the circuit.

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E26	16	E19	1	Yes
		5		2	
Front RH		9	E41	1	
		10		2	
Rear LH		6	C2	1	
		17		2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000007418858

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-87, "Diagnosis Procedure".

C1120, C1122, C1124, C1126 IN ABS SOL

Description

INFOID:0000000007418859

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:0000000007418860

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1120, C1122, C1124 or C1126 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-100, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418861

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-81, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000007418862

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-100, "Diagnosis Procedure".

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

INFOID:0000000007418863

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:0000000007418864

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1121, C1123, C1125 or C1127 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-102, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418865

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-15, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000007418866

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-102, "Diagnosis Procedure".

C1130, C1131, C1132, C1133 ENGINE SIGNAL

Description

INFOID:0000000007418867

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

DTC Logic

INFOID:0000000007418868

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		

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.

1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1130, C1131, C1132, C1133 or C1136 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-104, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418869

1.CHECK ENGINE SYSTEM

1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to EC-99, "CONSULT Function" (QR25DE), EC-422, "CONSULT Function" (VQ35DE).
2. Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-81, "CONSULT Function (ABS)".

Is the inspection result normal?

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

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000007418870

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:0000000007418871

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 system malfunction

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC U1000 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-105, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418872

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self diagnostic result. Refer to BRC-81, "CONSULT Function (ABS)".

Is DTC U1000 detected?

YES >> Refer to LAN-15, "Trouble Diagnosis Flow Chart".
NO >> Inspection End.

STOP LAMP SWITCH

Description

INFOID:0000000007418873

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

Component Function Check

INFOID:0000000007418874

1.CHECK DATA MONITOR

On “DATA MONITOR”, select “STOP LAMP SW” and check the stop lamp switch signal.

Condition	STOP LAMP SW (DATA MONITOR)
Brake pedal depressed.	On
Brake pedal released.	Off

Is the inspection result normal?

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

Diagnosis Procedure

INFOID:0000000007418875

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

1.CHECK STOP LAMP SWITCH

Perform the stop lamp switch component inspection. Refer to BRC-107, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 2
NO >> Replace stop lamp switch.

2.CHECK STOP LAMP RELAY-1

Perform the stop lamp relay-1 component inspection. Refer to BRC-107, "Component Inspection (Stop Lamp Relay)".

Is the inspection result normal?

YES >> GO TO 3
NO >> Replace stop lamp relay-1.

3.CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

1. Connect stop lamp switch and stop lamp relay-1 connectors.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E26	20	—	Brake pedal depressed	Battery voltage
			Brake pedal released	0V

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
NO >> GO TO 4

4.CHECK STOP LAMP RELAY-1 COIL CIRCUIT

1. Disconnect stop lamp relay-1 connector.
2. Check voltage between stop lamp relay-1 connector E57 terminal 1 and ground.

Stop lamp relay-1		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E57	1	—	Brake pedal depressed	Battery voltage
			Brake pedal released	0V

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair circuit between stop lamp switch and stop lamp relay or circuit between fuse block J/B and stop lamp switch.

5.CHECK STOP LAMP RELAY-1 SWITCH INPUT CIRCUIT

Check voltage between stop lamp relay-1 connector E57 terminal 5 and ground.

Stop lamp relay-1		Ground	Voltage (Approx.)
Connector	Terminal		
E57	5	—	Battery voltage

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair circuit between fuse block J/B and stop lamp relay.

6.CHECK STOP LAMP RELAY-1 GROUND CIRCUIT

Check continuity between stop lamp relay-1 connector E57 terminal 2 and ground.

Stop lamp relay-1		Ground	Continuity
Connector	Terminal		
E57	2	—	Yes

Is the inspection result normal?

YES >> Repair circuit between stop lamp relay and ABS actuator and electric unit (control unit).
NO >> Repair stop lamp relay ground circuit.

Component Inspection (Stop Lamp Switch)

INFOID:0000000007418876

1.CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch connector.
3. Check continuity between stop lamp switch terminals.

Stop lamp switch terminals	Condition	Continuity
1 – 2	Brake pedal depressed.	Yes
	Brake pedal released.	No

Is the inspection result normal?

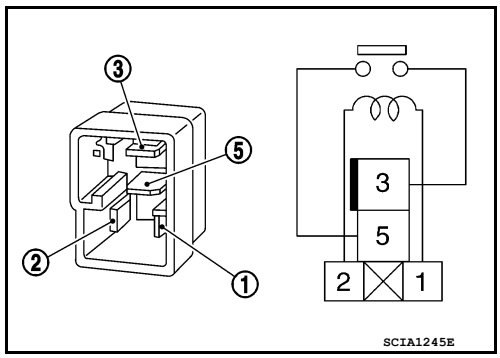
YES >> Inspection End.
NO >> Replace stop lamp switch.

Component Inspection (Stop Lamp Relay)

INFOID:0000000007418877

1.CHECK STOP LAMP RELAY

1. Turn ignition switch OFF.
2. Disconnect stop lamp relay connector.
3. Apply battery voltage to stop lamp relay terminal 1 and ground to terminal 2.
4. Check continuity between stop lamp relay terminals 3 and 5.



Stop lamp relay terminals	Condition	Continuity
3 – 5	Battery voltage applied to terminal 1 and ground to terminal 2	Yes
	Voltage and ground removed	No

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace stop lamp relay.

ABS WARNING LAMP

Description

INFOID:0000000007418878

×: ON –: OFF

Condition	ABS warning lamp
Ignition switch OFF	–
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	–
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000007418879

1.CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End
NO >> Go to diagnosis procedure. Refer to BRC-109, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007418880

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-81, "CONSULT 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-28, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-139, "Removal and Installation".

BRAKE WARNING LAMP

Description

INFOID:0000000007418881

×: ON –: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	–
Ignition switch ON	× (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:0000000007418882

1.BRAKE WARNING LAMP OPERATION CHECK 1

Check that the lamp illuminates after the ignition switch is turned ON, and turns OFF after the engine is started.

Is the inspection result normal?

YES >> GO TO 2
NO >> Go to diagnosis procedure. Refer to BRC-110, "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 BR-13, "Inspection and Adjustment".

Diagnosis Procedure

INFOID:0000000007418883

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 BR-13, "Inspection and Adjustment".

2.CHECK SELF-DIAGNOSIS RESULT

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-81, "CONSULT 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-28, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-139, "Removal and Installation".

TCS OFF SWITCH

Description

INFOID:0000000007418884

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

Component Function Check

INFOID:0000000007418885

1.CHECK TCS OFF SWITCH OPERATION

Press and release the TCS OFF switch, then press and release the TCS OFF switch again 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: pressed and released	ON
TCS OFF switch: pressed and released	OFF

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to BRC-111, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007418886

Regarding Wiring Diagram information, refer to BRC-117, "Wiring Diagram - TCS".

1.CHECK TCS OFF SWITCH

Perform the TCS OFF switch component inspection. Refer to BRC-112, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2
NO >> Replace TCS OFF switch.

2.CHECK TCS OFF SWITCH HARNESS

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 13 and TCS OFF switch connector M72 terminal 1.

ABS actuator and electric unit (control unit)		TCS OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E26	13	M72	1	Yes

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	13	—	No

Is the inspection result normal?

YES >> GO TO 3
NO >> Repair or replace malfunctioning components.

3.CHECK TCS OFF SWITCH GROUND

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

TCS OFF switch		Ground	Continuity
Connector	Terminal		
M72	2	—	Yes

Is the inspection result normal?

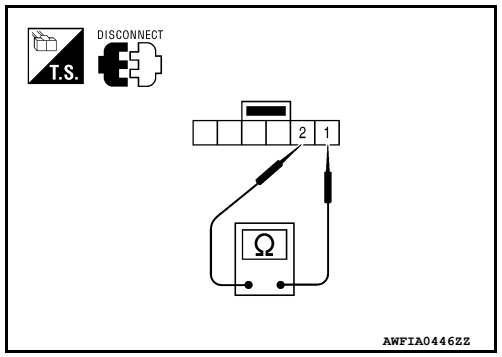
YES >> Inspection end.
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000007418887

1.CHECK TCS OFF SWITCH

1. Disconnect TCS OFF switch connector.
2. Check continuity between TCS OFF switch terminals.



TCS OFF switch terminals	Condition	Continuity
1, 2	TCS OFF switch pressed	Yes
	TCS OFF switch released	No

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace TCS OFF switch.

SLIP INDICATOR LAMP

Description

INFOID:0000000007418888

×: ON –: OFF

Condition	SLIP indicator lamp
Ignition switch OFF	–
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	–
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000007418889

1.CHECK SLIP INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End
NO >> Go to diagnosis procedure. Refer to BRC-113, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007418890

1.CHECK SELF DIAGNOSTIC RESULT

Perform ABS actuator and electric unit (control unit) self diagnostic result. Refer to BRC-81, "CONSULT Function (ABS)".

Is the inspection result normal?

YES >> GO TO 2
NO >> Check items displayed by self diagnostic result. Refer to BRC-115, "DTC No. Index".

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-4, "Work Flow".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-139, "Removal and Installation".

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000007418891

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 LH IN SOL FR LH OUT SOL FR RH IN SOL FR RH OUT SOL RR LH IN SOL RR LH OUT SOL RR RH IN SOL RR RH OUT SOL	Operation status of all solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) 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-81, "CONSULT Function (ABS)".

Fail-Safe

INFOID:0000000007418892

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:0000000007418893

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-84, "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.	

Display item	Malfunction detecting condition	Check item
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-87, "Diagnosis Procedure" (Note)
RR LH SENSOR-2 [C1106]	When the circuit in the rear LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR-2 [C1107]	When the circuit in the front RH wheel sensor is short-circuited. Or when the 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-90, "Diagnosis Procedure"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-92, "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-93, "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-95, "Diagnosis Procedure"
ABS SENSOR [C1115]	Teeth damage on sensor rotor or improper installation of wheel sensor.	BRC-97, "Diagnosis Procedure"
FR LH IN ABS SOL [C1120]	When the control unit detects a malfunction in the front left inlet solenoid circuit.	BRC-100, "Diagnosis Procedure"
FR LH OUT ABS SOL [C1121]	When the control unit detects a malfunction in the front left outlet solenoid circuit.	BRC-102, "Diagnosis Procedure"
FR RH IN ABS SOL [C1122]	When the control unit detects a malfunction in the front right inlet solenoid circuit.	BRC-100, "Diagnosis Procedure"
FR RH OUT ABS SOL [C1123]	When the control unit detects a malfunction in the front right outlet solenoid circuit.	BRC-102, "Diagnosis Procedure"
RR LH IN ABS SOL [C1124]	When the control unit detects a malfunction in the rear left inlet solenoid circuit.	BRC-100, "Diagnosis Procedure"
RR LH OUT ABS SOL [C1125]	When the control unit detects a malfunction in the rear left outlet solenoid circuit.	BRC-102, "Diagnosis Procedure"
RR RH IN ABS SOL [C1126]	When the control unit detects a malfunction in the rear right inlet solenoid circuit.	BRC-100, "Diagnosis Procedure"
RR RH OUT ABS SOL [C1127]	When the control unit detects a malfunction in the rear right outlet solenoid circuit.	BRC-102, "Diagnosis Procedure"
ENGINE SIGNAL 1 [C1130]	Fuel cut control abnormal.	BRC-104, "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-105, "Diagnosis Procedure"

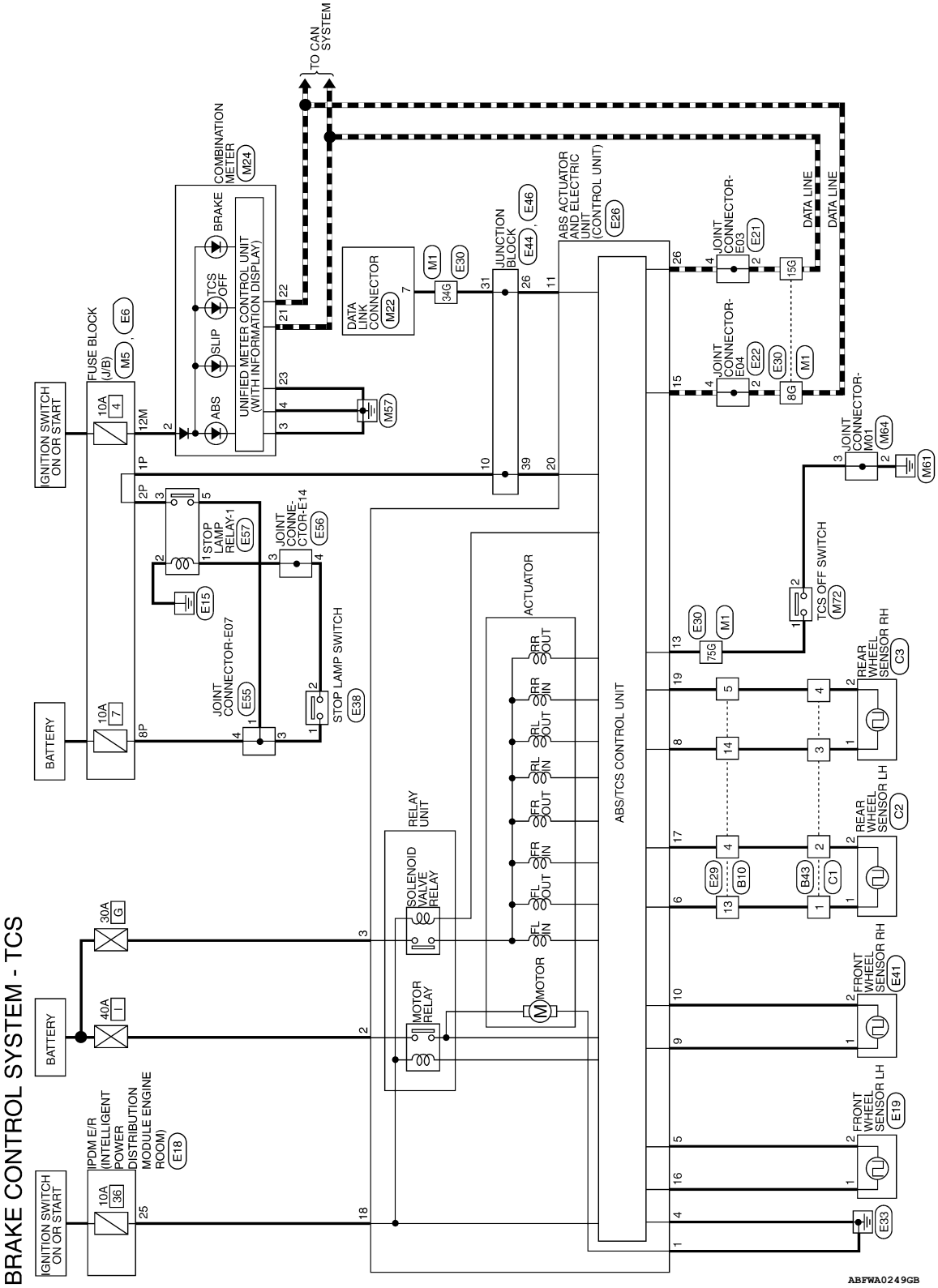
Note: After completing repairs of shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Make sure that ABS warning lamp turns off while driving vehicle at 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor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

WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram - TCS

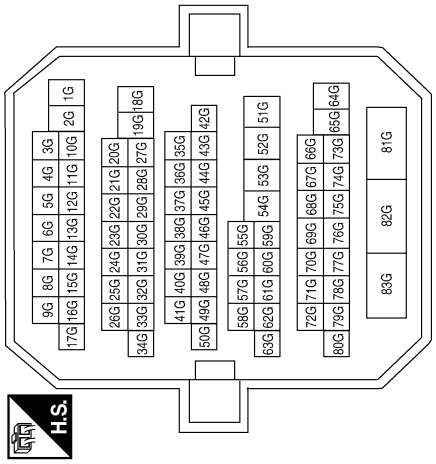
INFOID:0000000007418894



BRAKE CONTROL SYSTEM CONNECTORS - TCS

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

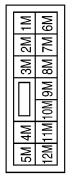
H.S.



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

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

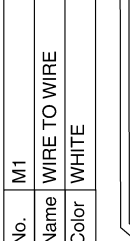
H.S.



Terminal No.	Color of Wire	Signal Name
12M	O	–

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

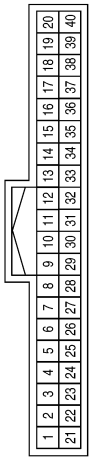
H.S.



Terminal No.	Color of Wire	Signal Name
7	O	–

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

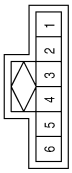
H.S.



Terminal No.	Color of Wire	Signal Name
2	O	IGN
3	B	GND (POWER)
4	B	GND (ILL)
21	L	CAN-H
22	P	CAN-L
23	B	GND (CIRCUIT)

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

H.S.



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

ABFIA0343GB

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	Y	–
8P	R	–

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	W	–
2	V	–

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	–

AAFIA0085GB

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.	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	UB (MR)
3	R	UB (VR)
4	B	GND
5	V	DS FL
6	G	DP RL
7	–	–
8	L	DP RR
9	B	DP FR
10	LG	DS FR
11	GR	DIAG-K
12	–	–
13	R	ASR AUS (TCS)
14	–	–
15	P	CAN-L
16	W	DP FL
17	O	DS RL
18	GR	UZ
19	BR	DS RR
20	SB	BLS
21	–	–
22	–	–
23	–	–
24	–	–
25	–	–
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	O	–
5	BR	–
13	G	–
14	L	–

ABFIA0345GB

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	–
75G	R	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	R	–
2	LG	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	B	–
2	LG	–

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	GR	–
31	O	–
39	SB	–

ABFIA0346GB

Connector No.	E55
Connector Name	JOINT CONNECTOR-E07
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	W	–
3	R	–
4	R	–

Connector No.	E56
Connector Name	JOINT CONNECTOR-E14
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
3	LG	–
4	LG	–

Connector No.	E57
Connector Name	STOP LAMP RELAY-1
Connector Color	BLUE

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	B	–
3	Y	–
5	W	–

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–
3	LG	–
4	BR	–

Connector No.	C2
Connector Name	REAR WHEEL SENSOR LH
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–

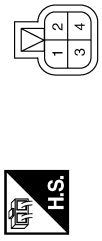
Connector No.	C3
Connector Name	REAR WHEEL SENSOR RH
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	BR	–

AAFIA0086GB

Connector No.	B43
Connector Name	WIRE TO WIRE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–
3	LG	–
4	BR	–

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

Terminal No.	Color of Wire	Signal Name
4	O	–
5	BR	–
13	G	–
14	LG	–

AAFIA0087GB

SYMPTOM DIAGNOSIS

TCS

Symptom Table

INFOID:0000000007418895

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-125, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-126, "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-127, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-128, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-129, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-130, "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:0000000007418896

1.CHECK START

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

Is the inspection result normal?

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

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles. Refer to front: FAX-6, "Inspection", Rear: RAX-6, "On-vehicle Service".

Is the inspection result normal?

YES >> GO TO 3
NO >> Repair or replace malfunctioning components.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following.
- Wheel sensor installation for damage.
- Sensor rotor installation for damage.
- Wheel sensor connector connection.
- Wheel sensor harness inspection.

Is the inspection result normal?

YES >> GO TO 4
NO >>
- Replace wheel sensor or sensor rotor. Refer to BRC-136, "Removal and Installation" or BRC-138, "Removal and Installation".
- Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> System normal.
NO >> Perform self-diagnosis. Refer to BRC-15, "CONSULT Function (ABS)".

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000007418897

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-13, "Inspection and Adjustment".

Is the stroke too big?

YES >> • Bleed air from brake tube and hose. Refer to BR-16, "Bleeding Brake System".
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: BR-13, "Inspection and Adjustment", brake booster: BR-9, "Inspection" and master cylinder: BR-10, "On Board 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.

Is the inspection result normal?

YES >> Inspection End.
NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000007418898

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

1.CHECK FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000007418899

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

1.CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned on or when driving.

Is the inspection result normal?

YES >> Inspection End.
NO >> Perform self-diagnosis. Refer to BRC-81, "CONSULT Function (ABS)".

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000007418900

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 that there are pedal vibrations when the engine is started.

Do symptoms occur?

YES >> GO TO 2
NO >> Inspect the brake pedal.

2.SYMPTOM CHECK 2

Check that there are ABS operation noises when the engine is started.

Do symptoms occur?

YES >> GO TO 3
NO >> Perform self diagnostic result. Refer to BRC-81, "CONSULT Function (ABS)".

3.SYMPTOM CHECK 3

Check symptoms when electrical component (headlamps, etc.) switches are operated.

Do symptoms occur?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.
NO >> Inspection End.

VEHICLE JERKS DURING TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000007418901

1.SYMPTOM CHECK

Check if the vehicle jerks during TCS/ABS control.

Is the inspection result normal?

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

2.CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnostic of ABS actuator and electric unit (control unit). Refer to BRC-81, "CONSULT Function (ABS)".

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. Refer to EC-422, "CONSULT Function" or TM-123, "CONSULT Function (TRANSMISSION)".

Are self-diagnosis results indicated?

YES >> Check the corresponding items.
- ECM: Refer to EC-422, "CONSULT Function".
- CVT: Refer to TM-123, "CONSULT Function (TRANSMISSION)".

NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-139, "Removal and Installation".

NORMAL OPERATING CONDITION

Description

INFOID:0000000007418902

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"

INFOID:0000000007418903

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

WARNING:

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

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

WARNING:

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

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000007418904

NOTE:

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

This vehicle is equipped with a push-button ignition switch and a steering lock unit.
If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

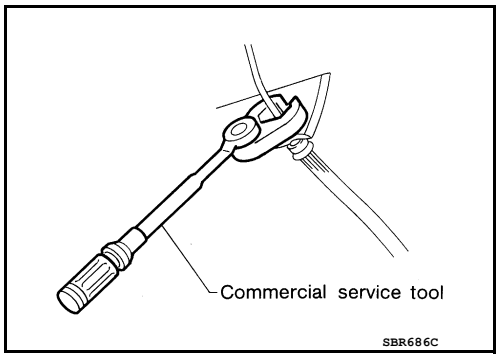
1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Brake System

INFOID:0000000007418905

- Recommended fluid is brake fluid “DOT 3”.
- Do not 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.
- Do not 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:0000000007418906

- 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.

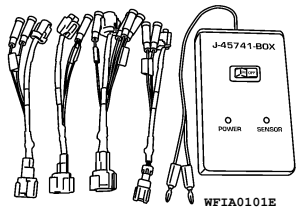
PREPARATION

PREPARATION

Special Service Tool

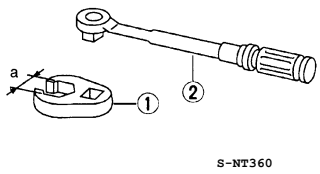
INFOID:0000000007418907

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 	Checking operation of ABS active wheel sensor

Commercial Service Tool

INFOID:0000000007418908

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

REMOVAL AND INSTALLATION

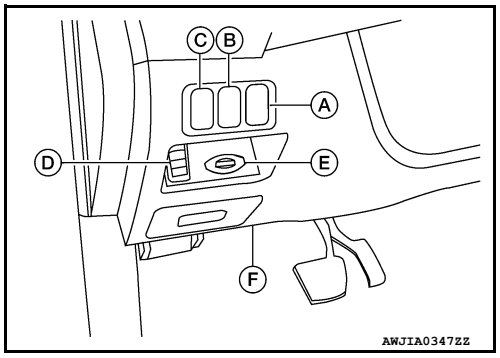
TCS OFF SWITCH

Removal and Installation

INFOID:0000000007418909

REMOVAL

1. Remove instrument lower cover to access the TCS OFF switch. Refer to IP-11, "Exploded View".
2. Disconnect the following harness connectors to remove from the instrument lower cover:
   - Headlamp aiming (A)
   - Rear sonar system off switch (B)
   - TCS OFF (C)
   - Trunk release (D)
   - Key slot (E)
   - Diagnostic connector (F)
   - Aspirator tube
3. Remove TCS OFF switch from the back of the instrument lower cover



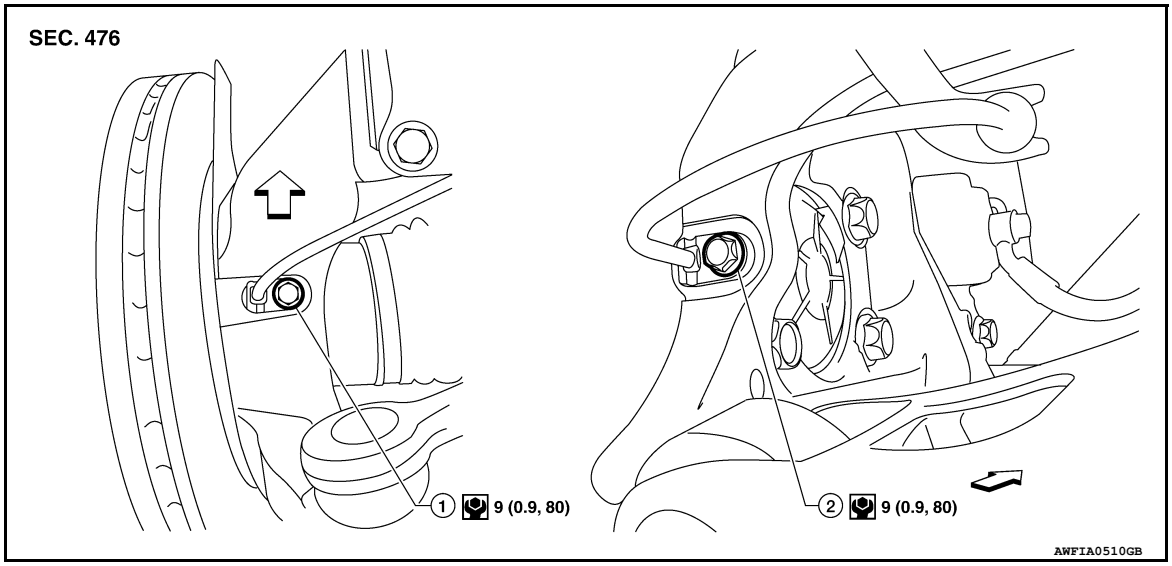
INSTALLATION

Installation is in the reverse order of removal.

WHEEL SENSORS

Removal and Installation

INFOID:0000000007418910



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, first remove the wheel sensor from the wheel hub. Failure to do so may result in damage to the wheel sensor wires making the sensor inoperative.**
- **Pull out the wheel sensor, being careful to turn it as little as possible. Do not pull on the wheel sensor harness.**
- **Before installation, 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 in the wheel hub for the wheel sensor, or if a foreign object is caught in the surface of the mating surface for the sensor rotor. Fix as necessary and then install the wheel sensor.**

FRONT WHEEL SENSOR

Removal

1. Remove front wheel and tire. Refer to WT-68, "Adjustment".
2. Partially remove front wheel fender protector. Refer to EXT-22, "Removal and Installation" (Coupe), EXT-46, "Removal and Installation" (Sedan).
3. Remove wheel sensor bolt and wheel sensor.
4. Remove harness wire from mounts and disconnect wheel sensor harness connector.

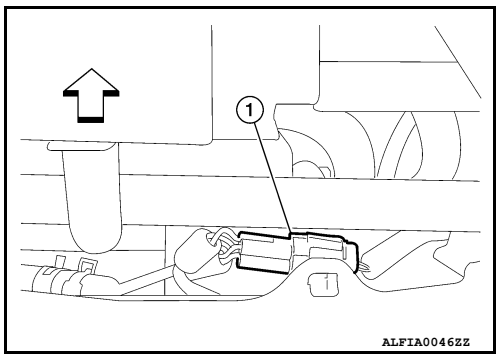
Installation
Installation is in the reverse order of removal.

REAR WHEEL SENSOR

Removal

1. Remove rear wheel and tire. Refer to WT-68, "Adjustment".

2. Disconnect wheel sensor harness connector (1).
   - ⇦: Front
3. Remove harness wire clips from rear suspension member.
4. Remove wheel sensor bolt and wheel sensor from rear wheel hub and bearing assembly.



Installation

Installation is in the reverse order of removal.

SENSOR ROTOR

Removal and Installation

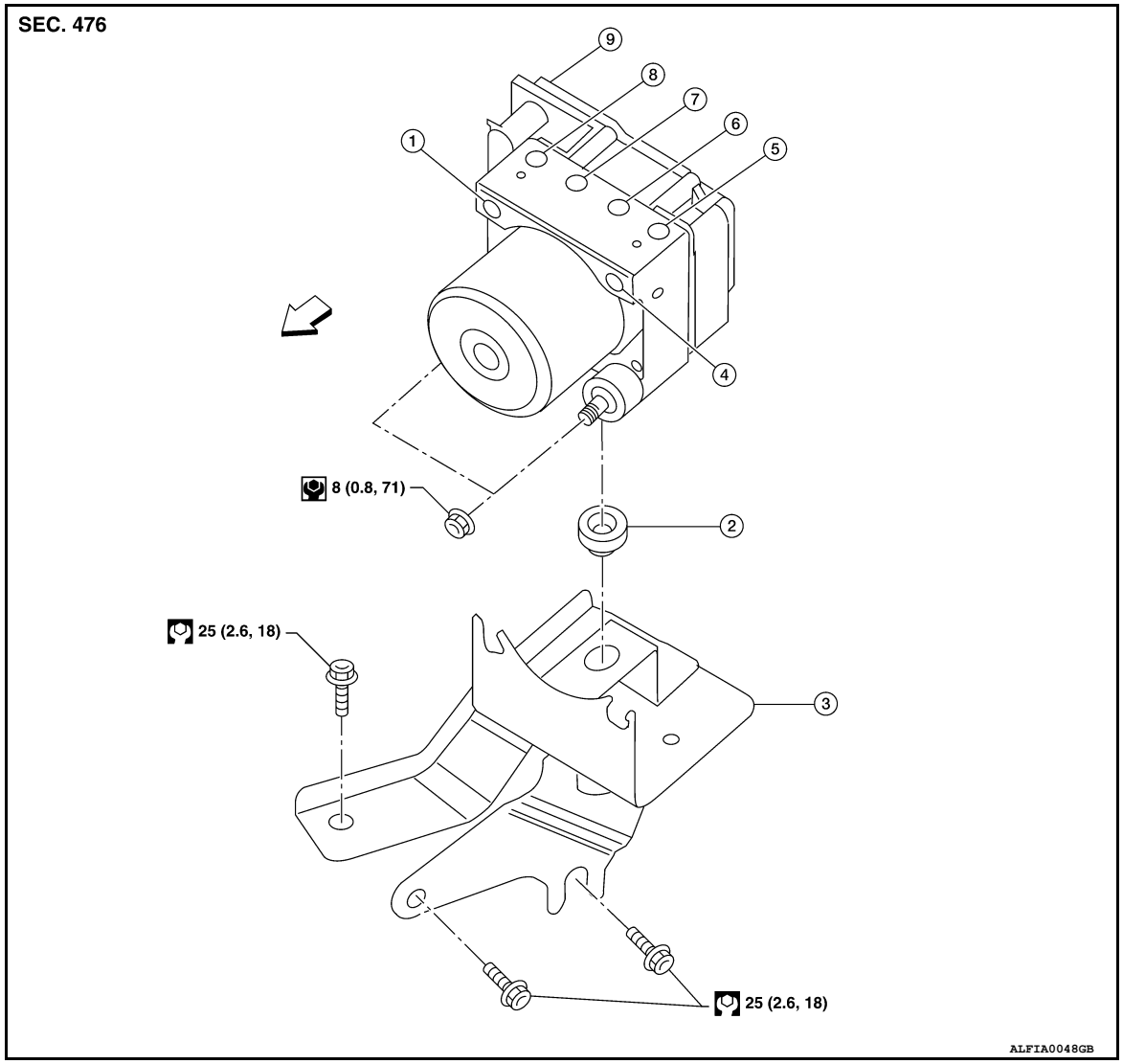
INFOID:0000000007418911

The front and rear wheel sensor rotors are an integral part of the wheel hubs and can not be disassembled. When replacing the sensor rotor, replace the wheel hub. Refer to FAX-8, "Removal and Installation" (front), RAX-7, "Removal and Installation" (rear).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:0000000007418912



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 (control unit)

⇦ Front

Removal and Installation

INFOID:0000000007418913

CAUTION:

Be careful of the following.

- **Before servicing, disconnect the battery cable from negative terminal.**
- **To remove brake pipe, use a suitable tool (flare nut wrench) to prevent flare nuts and brake tube from being damaged. To install, use suitable tool (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 ABS actuator and electric unit (control unit) by holding harness.**
- **After work is completed, bleed air from brake tube. Refer to BR-16, "Bleeding Brake System".**
- **After installing harness connector on the ABS actuator and electric unit (control unit), make sure connector is securely locked.**

REMOVAL

NOTE:
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Remove cowl top. Refer to EXT-21, "Removal and Installation" (Coupe), EXT-45, "Removal and Installation" (Sedan).
2. Disconnect washer hose.
3. Disconnect the battery negative terminal.
4. Remove strut tower bar, if equipped. Refer to FSU-14, "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) using a suitable tool.
7. Remove ABS actuator and electric unit (control unit) nuts.
8. Remove ABS actuator and electric unit (control unit).
9. Remove bracket as necessary.

INSTALLATION

Installation is in the reverse order of removal.
Torque brake lines to proper specifications. Refer to BR-18, "Hydraulic Circuit".

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000007418914

1.COLLECT INFORMATION FROM THE CUSTOMER

Get 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-142, "Diagnostic Work Sheet".

>> GO TO 2.

2.PERFORM SELF DIAGNOSTIC RESULT

Perform self diagnostic result. Refer to BRC-158, "CONSULT Function (ABS)".

Are any DTCs displayed?

YES >> Refer to BRC-220, "DTC No. Index".
NO >> GO TO 3.

3.CHECK SYMPTOM OPERATING CONDITION

Check that the symptom is a normal operating condition. Refer to BRC-248, "Description".

Is the symptom a normal operating condition?

YES >> Inspection End.
NO >> GO TO 4.

4.CHECK WARNING AND INDICATOR LAMPS OPERATION

Check warning and indicator lamps operation.

- ABS warning lamp: Refer to BRC-209, "Description".
- brake warning lamp: Refer to BRC-210, "Description".
- VDC OFF indicator lamp: Refer to BRC-212, "Description".
- SLIP indicator lamp: Refer to BRC-214, "Description".

Is ON/OFF timing normal?

YES >> GO TO 5.
NO >> Perform warning lamp diagnosis. Refer to BRC-209, "Component Function Check" (ABS warning lamp), BRC-210, "Component Function Check" (brake warning lamp), BRC-212, "Component Function Check" (VDC OFF indicator lamp) or BRC-214, "Component Function Check" (SLIP indicator lamp).

5.PERFORM DIAGNOSIS APPLICABLE TO THE SYMPTOM

Perform diagnosis applicable to the symptom. Refer to BRC-241, "Symptom Table".

>> GO TO 6.

6.FINAL CHECK

Perform self diagnostic result again, and check that the malfunction is repaired. After checking, erase the self diagnosis memory. Refer to BRC-158, "CONSULT Function (ABS)".

>> Inspection End.

Diagnostic Work Sheet

INFOID:0000000007418915

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:0000000007418916

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:0000000007418917

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to BRC-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:0000000007418918

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 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:0000000007418919

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

CAUTION:

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

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

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

1. On the CONSULT screen, touch "WORK SUPPORT", 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-158, "CONSULT Function (ABS)".
- ECM: Refer to EC-99, "CONSULT Function" (QR25DE), EC-422, "CONSULT Function" (VQ35DE).

Are the memories erased?

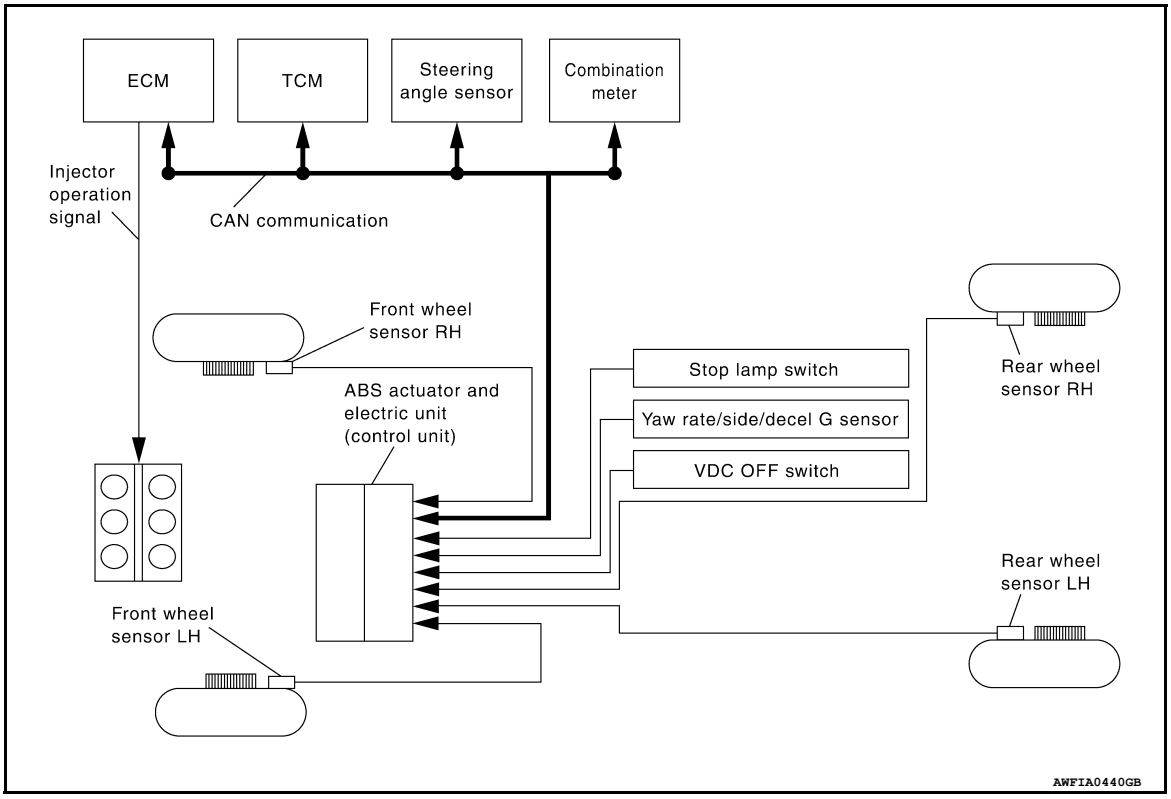
YES >> Inspection End
NO >> Check the items indicated by the self-diagnosis.

SYSTEM DESCRIPTION

VDC

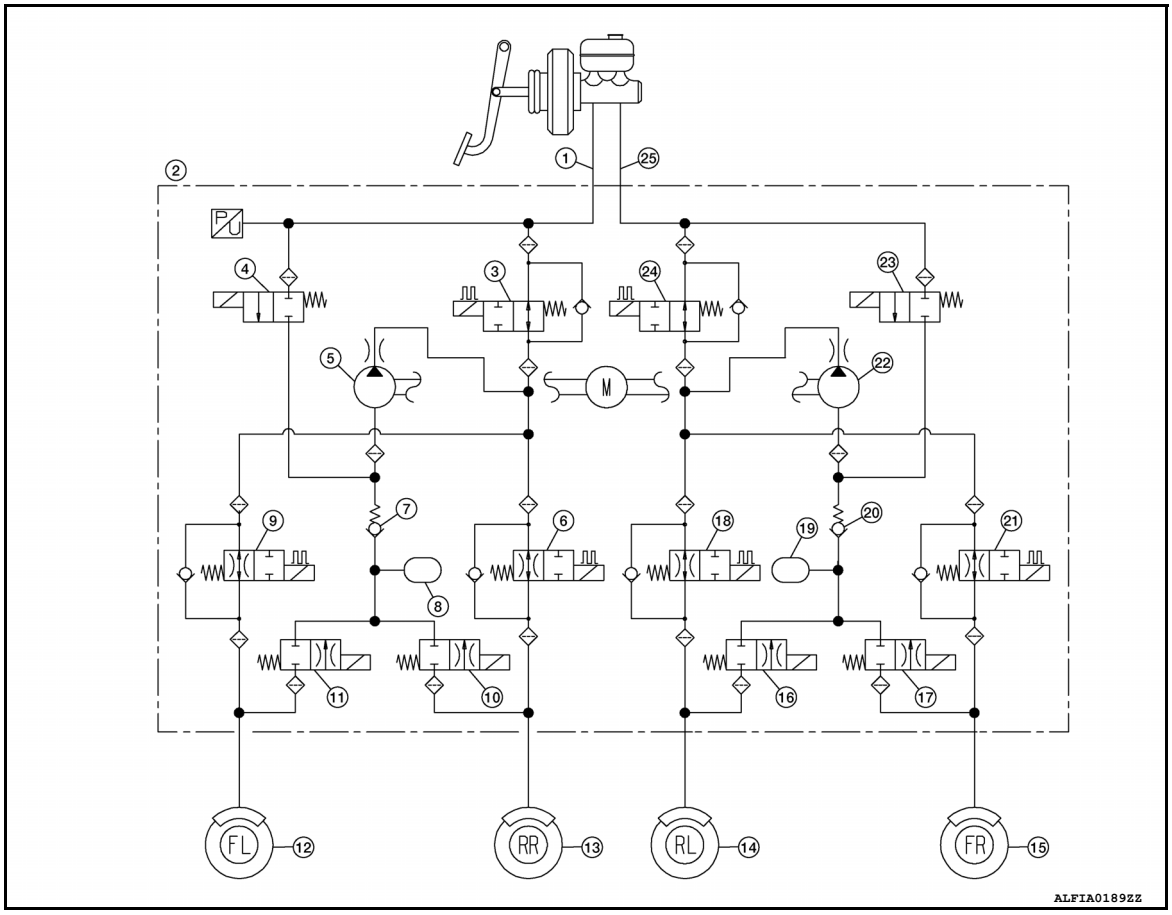
System Diagram

INFOID:0000000007418920



Hydraulic Circuit Diagram

INFOID:0000000007418921



1. Primary side
2. VDC/TCS/ABS actuator
3. Primary side VDC switch-over valve 1 (USV1)
4. Primary side VDC switch-over valve 1 (HSV1)
5. Primary side pump
6. Rear right inlet solenoid valve
7. Primary side inlet valve
8. Primary side damper
9. Front left inlet solenoid valve
10. Rear right outlet solenoid valve
11. Front left outlet solenoid valve
12. Front left caliper
13. Rear right caliper
14. Rear left caliper
15. Front right caliper
16. Rear left outlet solenoid valve
17. Front right outlet solenoid valve
18. Rear left inlet solenoid valve
19. Secondary side damper
20. Secondary side inlet valve
21. Front right inlet solenoid valve
22. Secondary side pump
23. Secondary side VDC switch-over valve 2 (HSV2)
24. Secondary side VDC switch-over valve 2 (USV2)
25. Secondary side

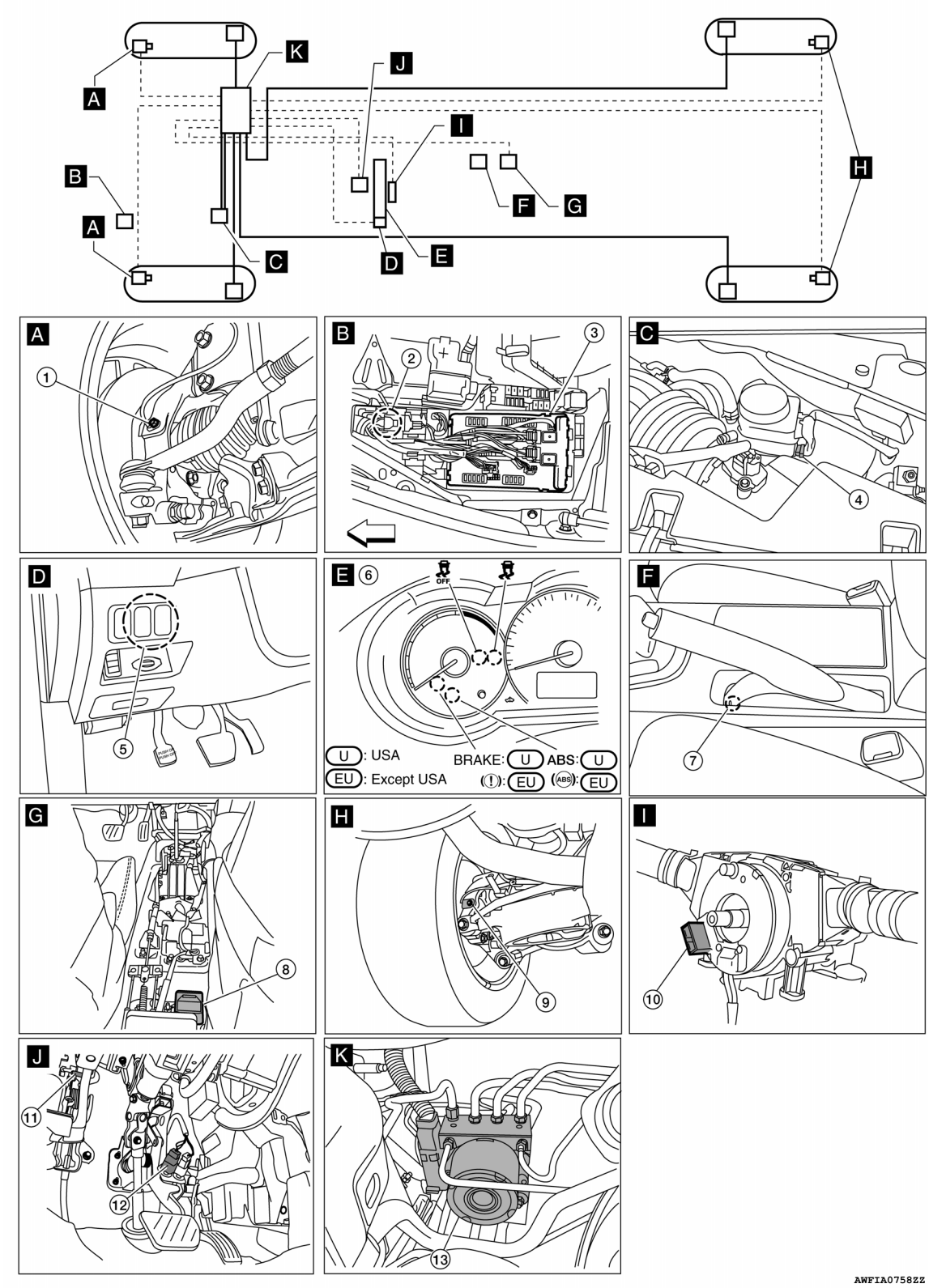
System Description

INFOID:0000000007418922

- Vehicle dynamic control system detects driver's steering operation amount from the steering angle sensor. Using input information from the yaw rate/side/decel G sensor and wheel speed sensors, the VDC system judges driving conditions (conditions of understeer and oversteer) and controls engine output and brake application to improve vehicle driving stability.
- During VDC operation, it informs driver of system operation by flashing SLIP indicator lamp.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

INFOID:0000000007418923



1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. Stop lamp relay E57 (with CVT)
3. IPDM E/R
4. Brake fluid level switch E24
5. VDC OFF switch M72
6. Combination meter M24
7. Parking brake switch M73 (Sedan with M/T)
8. Yaw rate/side/decel G sensor M55
9. Rear wheel sensor LH C2
   Rear wheel sensor RH C3

10. Steering angle sensor M53 (view with steering wheel removed)
11. Parking brake switch E35 (with CVT)
12. Stop lamp switch E38
13. ABS actuator and electric unit (control unit) E26

Component Description

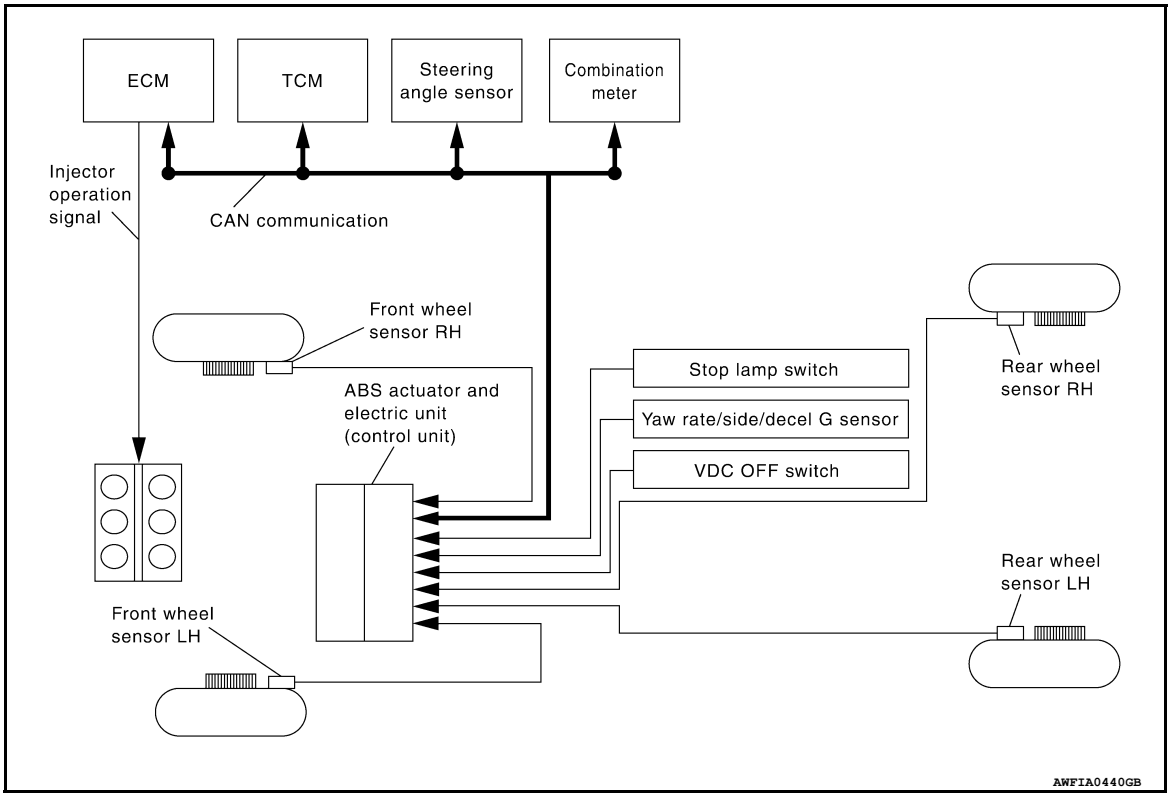
INFOID:0000000007418924

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-171, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-173, "Description"
	Solenoid valve	BRC-182, "Description"
	Pressure sensor	BRC-189, "Description"
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-196, "Description"
Wheel sensor		BRC-162, "Description"
Stop lamp switch		BRC-178, "Description"
Steering angle sensor		BRC-191, "Description"
Yaw rate/side/G sensor		BRC-193, "Description"
Brake fluid level switch		BRC-201, "Description"
Parking brake switch		BRC-205, "Description"
VDC OFF switch		BRC-207, "Description"
ABS warning lamp		BRC-209, "Description"
Brake warning lamp		BRC-210, "Description"
VDC OFF indicator lamp		BRC-212, "Description"
Slip indicator lamp		BRC-214, "Description"

TCS

System Diagram

INFOID:0000000007418925



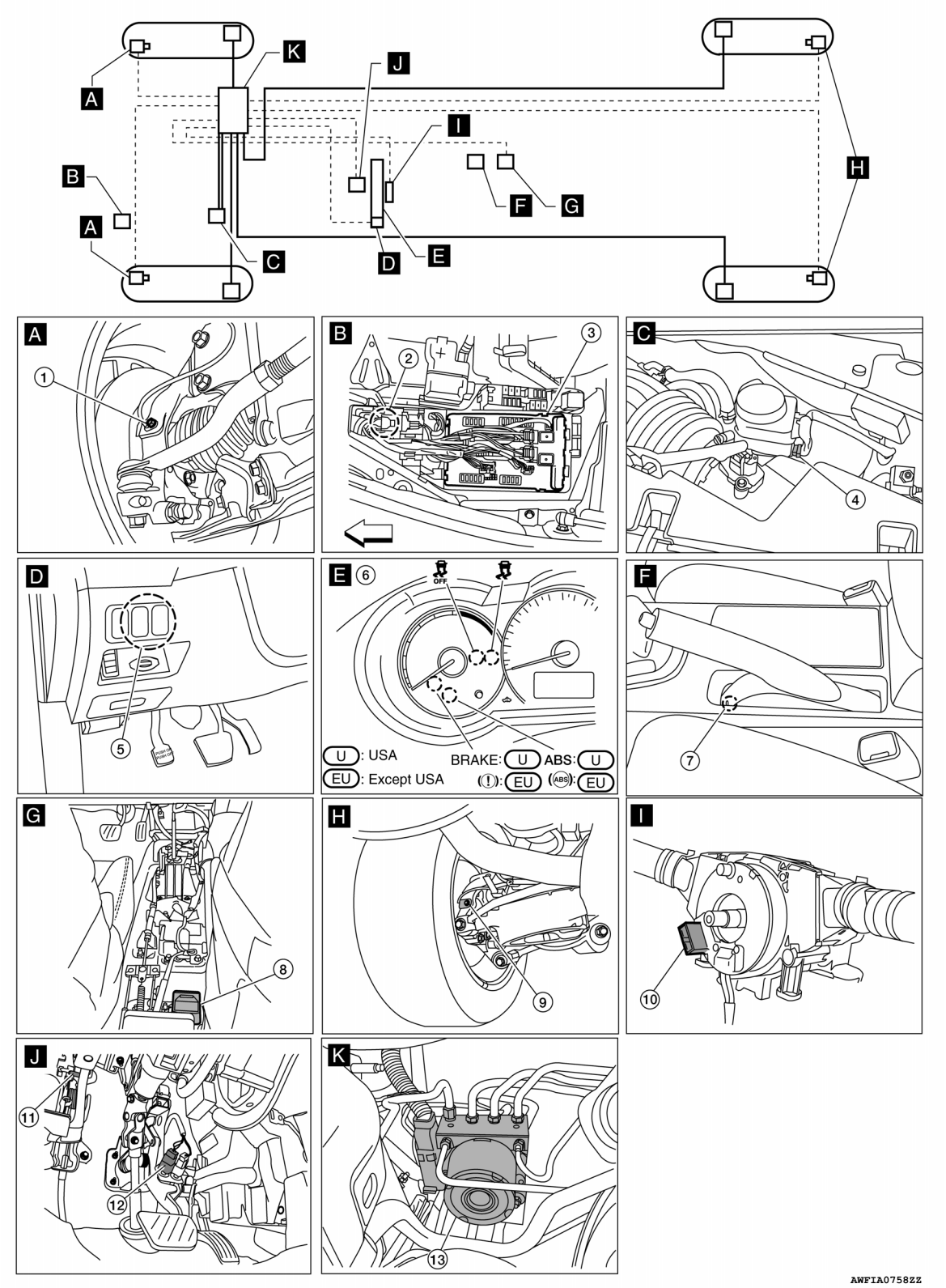
System Description

INFOID:0000000007418926

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

Component Parts Location

INFOID:0000000007418927



1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. Stop lamp relay E57 (with CVT)
3. IPDM E/R
4. Brake fluid level switch E24
5. VDC OFF switch M72
6. Combination meter M24
7. Parking brake switch M73 (Sedan with M/T)
8. Yaw rate/side/decel G sensor M55
9. Rear wheel sensor LH C2
   Rear wheel sensor RH C3

10. Steering angle sensor M53 (view with steering wheel removed)
11. Parking brake switch E35 (with CVT)
12. Stop lamp switch E38
13. ABS actuator and electric unit (control unit) E26

Component Description

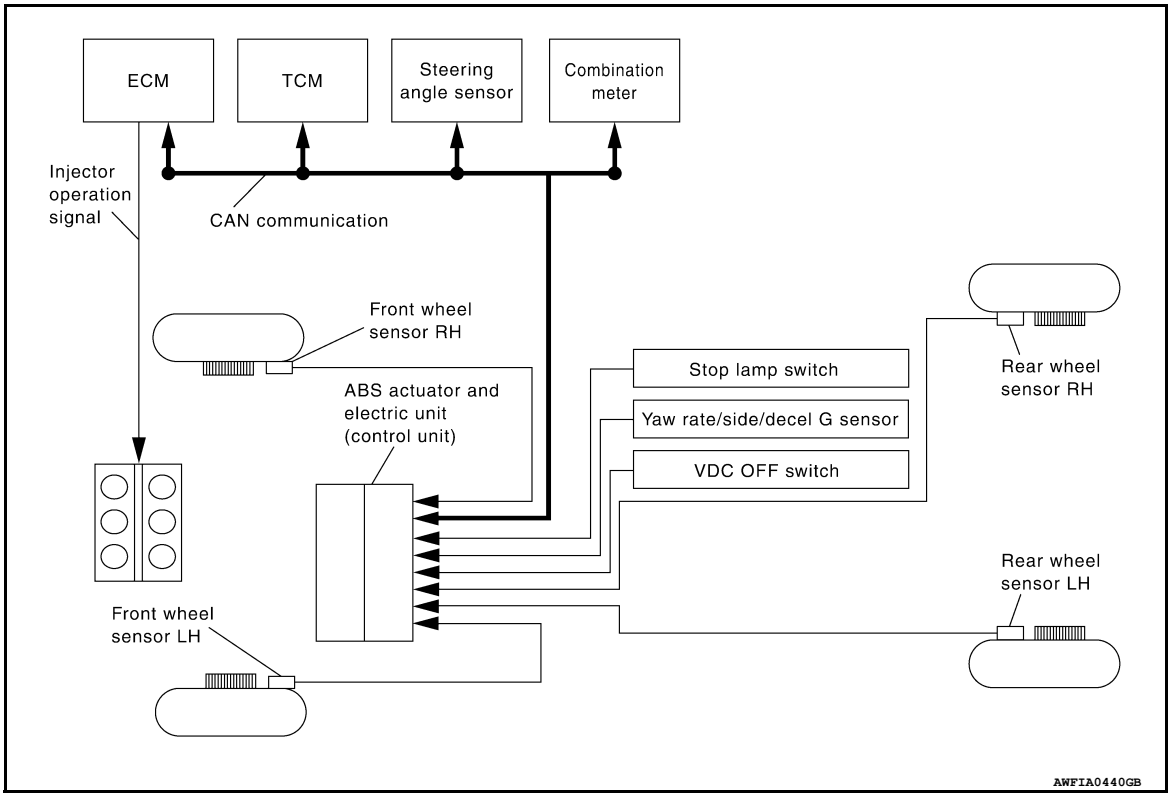
INFOID:0000000007418928

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-171, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-173, "Description"
	Solenoid valve	BRC-182, "Description"
	Pressure sensor	BRC-189, "Description"
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-196, "Description"
Wheel sensor		BRC-162, "Description"
Stop lamp switch		BRC-178, "Description"
Steering angle sensor		BRC-191, "Description"
Yaw rate/side/G sensor		BRC-193, "Description"
Brake fluid level switch		BRC-201, "Description"
Parking brake switch		BRC-205, "Description"
VDC OFF switch		BRC-207, "Description"
ABS warning lamp		BRC-209, "Description"
Brake warning lamp		BRC-210, "Description"
VDC OFF indicator lamp		BRC-212, "Description"
Slip indicator lamp		BRC-214, "Description"

ABS

System Diagram

INFOID:0000000007418929



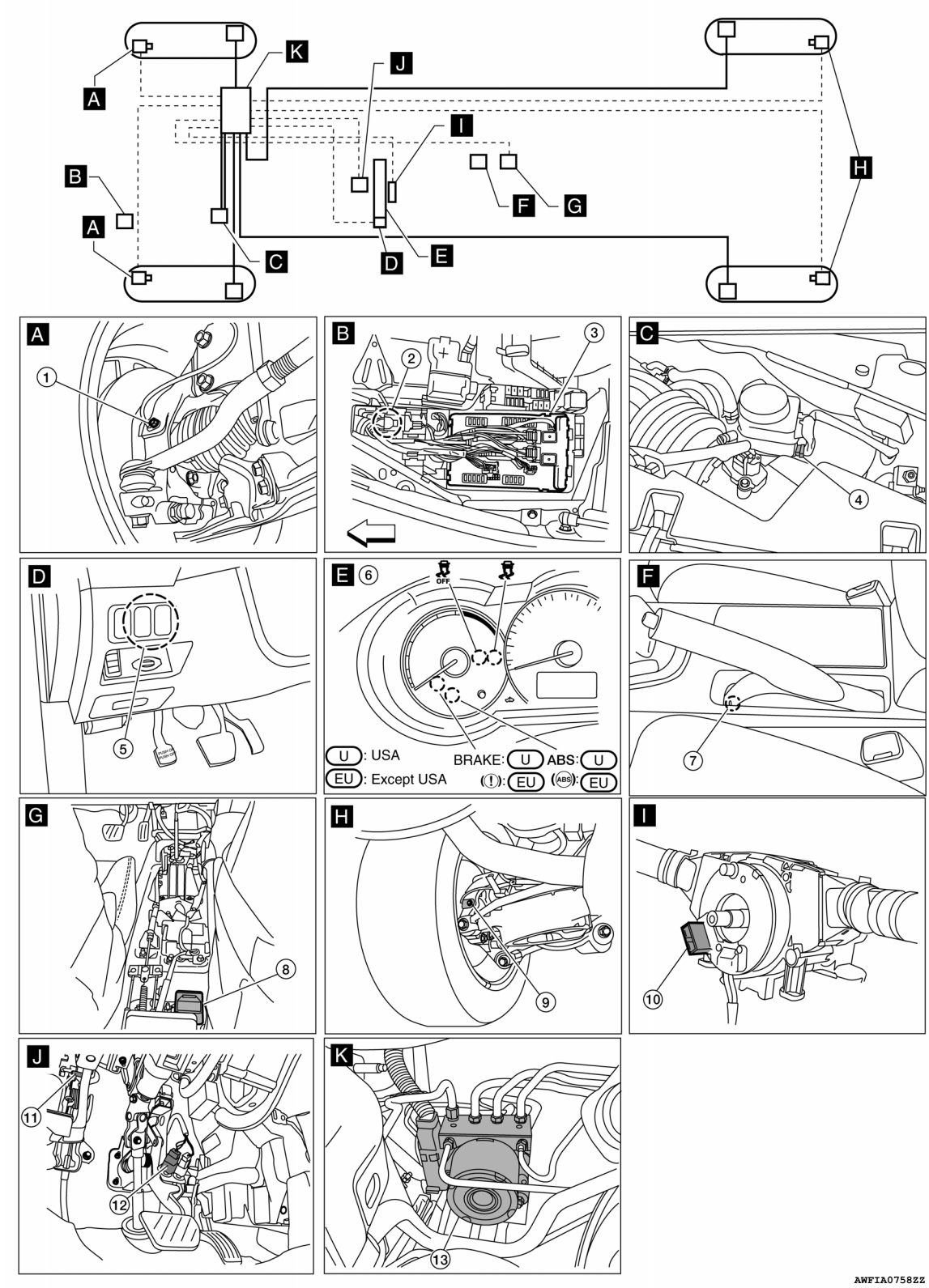
System Description

INFOID:0000000007418930

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

Component Parts Location

INFOID:0000000007418931



1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. Stop lamp relay E57 (with CVT)
3. IPDM E/R
4. Brake fluid level switch E24
5. VDC OFF switch M72
6. Combination meter M24
7. Parking brake switch M73 (Sedan with M/T)
8. Yaw rate/side/decel G sensor M55
9. Rear wheel sensor LH C2
   Rear wheel sensor RH C3

10. Steering angle sensor M53 (view with steering wheel removed)
11. Parking brake switch E35 (with CVT)
12. Stop lamp switch E38
13. ABS actuator and electric unit (control unit) E26

Component Description

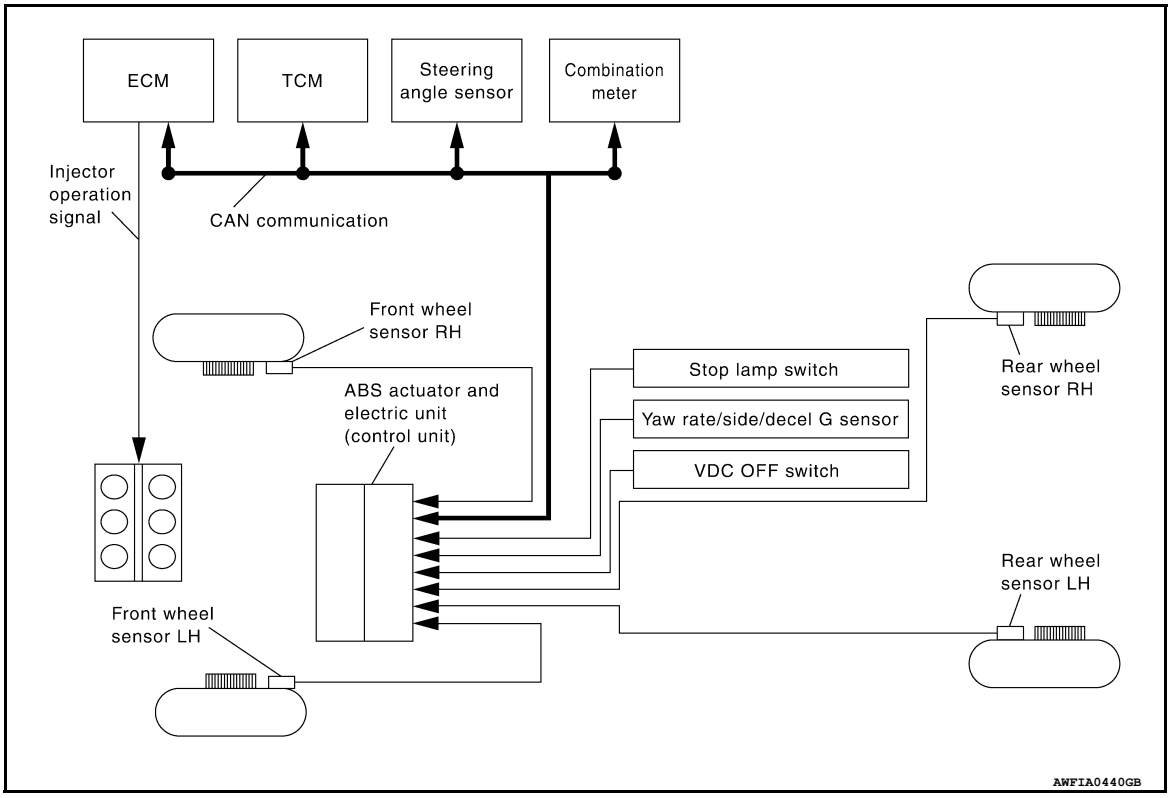
INFOID:0000000007418932

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-171, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-173, "Description"
	Solenoid valve	BRC-182, "Description"
	Pressure sensor	BRC-189, "Description"
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-196, "Description"
Wheel sensor		BRC-162, "Description"
Stop lamp switch		BRC-178, "Description"
Steering angle sensor		BRC-191, "Description"
Yaw rate/side/G sensor		BRC-193, "Description"
Brake fluid level switch		BRC-201, "Description"
Parking brake switch		BRC-205, "Description"
VDC OFF switch		BRC-207, "Description"
ABS warning lamp		BRC-209, "Description"
Brake warning lamp		BRC-210, "Description"
VDC OFF indicator lamp		BRC-212, "Description"
Slip indicator lamp		BRC-214, "Description"

EBD

System Diagram

INFOID:0000000007418933



System Description

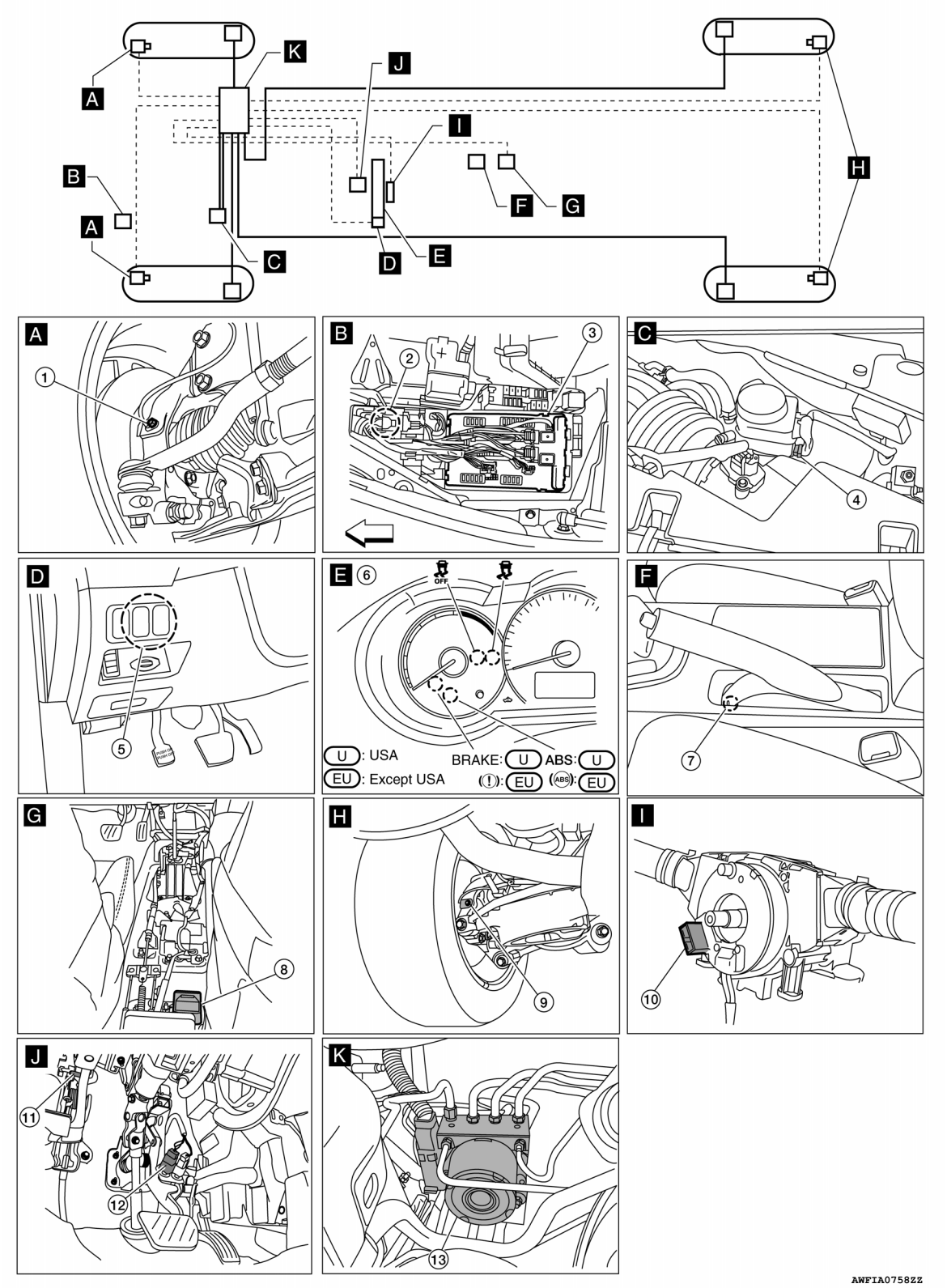
INFOID:0000000007418934

Electric Brake force Distribution functions as follows:

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

Component Parts Location

INFOID:0000000007418935



1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. Stop lamp relay E57 (with CVT)
3. IPDM E/R
4. Brake fluid level switch E24
5. VDC OFF switch M72
6. Combination meter M24
7. Parking brake switch M73 (Sedan with M/T)
8. Yaw rate/side/decel G sensor M55
9. Rear wheel sensor LH C2
   Rear wheel sensor RH C3

10. Steering angle sensor M53 (view with steering wheel removed)
11. Parking brake switch E35 (with CVT)
12. Stop lamp switch E38
13. ABS actuator and electric unit (control unit) E26

Component Description

INFOID:0000000007418936

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-171, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-173, "Description"
	Solenoid valve	BRC-182, "Description"
	Pressure sensor	BRC-189, "Description"
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-196, "Description"
Wheel sensor		BRC-162, "Description"
Stop lamp switch		BRC-178, "Description"
Steering angle sensor		BRC-191, "Description"
Yaw rate/side/G sensor		BRC-193, "Description"
Brake fluid level switch		BRC-201, "Description"
Parking brake switch		BRC-205, "Description"
VDC OFF switch		BRC-207, "Description"
ABS warning lamp		BRC-209, "Description"
Brake warning lamp		BRC-210, "Description"
VDC OFF indicator lamp		BRC-212, "Description"
Slip indicator lamp		BRC-214, "Description"

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

CONSULT Function (ABS)

INFOID:0000000007418937

FUNCTION

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

Diagnostic test mode	Function
Work support	Supports inspections and adjustments. Commands are transmitted to the ABS actuator and electric unit (control unit) for setting the status suitable for required operation, input/output signals are received from the ABS actuator and electric unit (control unit) and received data is displayed.
Data monitor	Displays ABS actuator and electric unit (control unit) input/output data in real time.
Active test	Operation of electrical loads can be checked by sending drive signals to them.
Function test	This mode is used to inform customers when the vehicle requires periodic maintenance.
Self diagnostic result	Displays ABS actuator and electric unit (control unit) self-diagnosis results.
CAN diag support mntr	The result of transmit/receive diagnosis of CAN communication can be read.
ECU identification	ABS actuator and electric unit (control unit) part number can be read.

SELF DIAGNOSTIC RESULT MODE

Operation Procedure

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

How to Erase Self-Diagnosis Results

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

CAUTION:

If memory cannot be erased, perform applicable diagnosis.

NOTE:

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

Display Item List

Refer to BRC-220, "DTC No. Index".

DATA MONITOR

Display Item List

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.

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.
STOP LAMP SW (On/Off)	×	×	×	Stop lamp switch (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.
OFF SW (On/Off)	×	×	×	VDC OFF switch (On/Off) status is displayed.
SLIP LAMP (On/Off)	—	×	×	SLIP indicator lamp (On/Off) status is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.
GEAR (1, 2, 3, 4, 5, 6)	×	×	×	Gear position while in manual mode determined by TCM is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor 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.
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.
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.
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)	—	—	×	Valve relay operation signal (On/Off) status is displayed.
M/R OUTPUT (On/Off)	—	—	×	Motor relay operation signal (On/Off) status is displayed.
ENGINE RPM (rpm)	×	—	×	Engine speed judged by CAN communication signal is displayed.

×: Applicable

–: Not applicable

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 or brake warning lamp on.**
- **ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp are on during active test.**

NOTE:

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

Test Item

SOLENOID VALVE

- When performing an active test of the ABS function, select “MAIN SIGNALS” for each test item.
- For ABS solenoid valve, touch “Up”, “Keep”, and “Down” on the display screen. For ABS solenoid valve (ACT), touch “Up”, “ACT UP”, “ACT KEEP” and confirm that solenoid valves operate as shown in the table below.

Operation		ABS solenoid valve			ABS solenoid valve (ACT)		
		Up	Keep	Down	Up	ACT UP	ACT KEEP
FR RH SOL	FR RH IN SOL	Off	On	On	—	—	—
	FR RH OUT SOL	Off	Off	On*	—	—	—
	USV [FR-RL]	Off	Off	On*	—	—	—
	HSV [FR-RL]	Off	Off	On*	—	—	—
FR LH SOL	FR LH IN SOL	Off	On	On	—	—	—
	FR LH OUT SOL	Off	Off	On*	—	—	—
	USV [FL-RR]	Off	Off	On*	—	—	—
	HSV [FL-RR]	Off	Off	On*	—	—	—
RR RH SOL	RR RH IN SOL	Off	On	On	—	—	—
	RR RH OUT SOL	Off	Off	On*	—	—	—
	USV [FL-RR]	Off	Off	On*	—	—	—
	HSV [FL-RR]	Off	Off	On*	—	—	—
RR LH SOL	RR LH IN SOL	Off	On	On	—	—	—
	RR LH OUT SOL	Off	Off	On*	—	—	—
	USV [FR-RL]	Off	Off	On*	—	—	—
	HSV [FR-RL]	Off	Off	On*	—	—	—
FR RH ABS SOLENOID (ACT)	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
FR LH ABS SOLENOID (ACT)	FR LH IN SOL	—	—	—	Off	Off	Off
	FR LH OUT SOL	—	—	—	Off	Off	Off
	USV [FL-RR]	—	—	—	Off	Off	Off
	HSV [FL-RR]	—	—	—	Off	Off	Off
RR RH ABS SOLENOID (ACT)	RR RH IN SOL	—	—	—	Off	Off	Off
	RR RH OUT SOL	—	—	—	Off	Off	Off
	USV [FL-RR]	—	—	—	Off	Off	Off
	HSV [FL-RR]	—	—	—	Off	Off	Off
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	—	—	—	Off	Off	Off
	RR LH 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

ABS MOTOR
- Touch “On” and “Off” on screen. Make sure motor relay AND actuator relay operate as shown in table below.

Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On

DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:0000000007418938

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:0000000007418939

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 DIAGNOSTIC RESULT

With CONSULT.

1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self diagnostic result.

Is DTC C1101, C1102, C1103 or C1104 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-162, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418940

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace wheel sensor. Refer to BRC-253, "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-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-7, "Removal and Installation" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1	—	No
2		

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair the circuit.

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E26	16	E19	1	Yes
		5		2	
Front RH		9	E41	1	
		10		2	
Rear LH		6	C2	1	
		17		2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000007418941

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-162, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007418942

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

INFOID:0000000007418943

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:0000000007418944

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 DIAGNOSTIC RESULT

With CONSULT.

1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self diagnostic result.

Is DTC C1105, C1106, C1107 or C1108 detected?

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

Diagnosis Procedure

INFOID:0000000007418945

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace wheel sensor. Refer to BRC-253, "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-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-7, "Removal and Installation" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1	—	No
2		

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair the circuit.

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E26	16	E19	1	Yes
		5		2	
Front RH		9	E41	1	
		10		2	
Rear LH		6	C2	1	
		17		2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000007418946

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-175, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007418947

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

DTC C1109 BATTERY VOLTAGE [ABNORMAL]

Description

INFOID:0000000007418948

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

DTC Logic

INFOID:0000000007418949

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1109 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-168, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418950

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is DTC 1109 detected?

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

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

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Turn ignition switch ON.
4. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 18 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx)
Connector	Terminal			
E26	18	—	Ignition switch ON	Battery voltage
			Ignition switch OFF	0V

5. Turn ignition switch OFF.

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

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

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

Special Repair Requirement

INFOID:0000000007418951

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

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

DTC Logic

INFOID:0000000007418952

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1110, C1153 or C1170 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-170, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418953

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). Refer to BRC-256, "Removal and Installation".

Special Repair Requirement

INFOID:0000000007418954

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

DTC C1111 PUMP MOTOR

Description

INFOID:0000000007418955

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:0000000007418956

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 DIAGNOSTIC RESULT

With CONSULT.

1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1111 detected?

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

Diagnosis Procedure

INFOID:0000000007418957

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is DTC C1111 detected?

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

2. CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	2	—	Battery voltage

Is the inspection result normal?

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

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

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000007418958

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-171, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007418959

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

DTC C1114 MAIN RELAY

Description

INFOID:0000000007418960

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

DTC Logic

INFOID:0000000007418961

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1114 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-173, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418962

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

YES >> GO TO 3
NO >> • Repair or replace malfunctioning components.

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

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
- Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

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

Component Inspection

INFOID:0000000007418963

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-171, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007418964

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

DTC C1115 ABS SENSOR [ABNORMAL SIGNAL]

Description

INFOID:0000000007418965

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:0000000007418966

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 DIAGNOSTIC RESULT

With CONSULT.

1. Start engine and drive vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Perform self diagnostic result.

Is DTC C1115 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-175, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418967

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

CAUTION:
Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) and malfunctioning wheel sensor connectors.
2. Check terminals to see if they are deformed, disconnected, loose, etc., Repair or replace if any malfunction condition is found.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
2. Turn on the ABS active wheel sensor tester power switch.
   NOTE:
   The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.
3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.
   NOTE:
   If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3
NO >> Replace wheel sensor. Refer to BRC-253, "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-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-7, "Removal and Installation" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

Check continuity between wheel sensor connector terminals and ground.

Wheel sensor connector terminal	Ground	Continuity
1	—	No
2		

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair the circuit.

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	
Front LH	E26	16	E19	1	Yes
		5		2	
Front RH		9	E41	1	
		10		2	
Rear LH		6	C2	1	
		17		2	
Rear RH		8	C3	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000007418968

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-175, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007418969

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1116 STOP LAMP SW

Description

INFOID:0000000007418970

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit) either directly (with M/T) or through the stop lamp relay (with CVT).

DTC Logic

INFOID:0000000007418971

DTC DETECTION LOGIC

DTC	Display	Condition	Possible Cause
C1116	STOP LAMP SW	When stop lamp switch signal circuit is open.	• Harness or connector • Stop lamp switch • Stop lamp relay (with CVT) • ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1116 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-178, "Diagnosis Procedure (With M/T)" or BRC-179, "Diagnosis Procedure (With CVT)".
NO >> Inspection End.

Diagnosis Procedure (With M/T)

INFOID:0000000007418972

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self diagnostic result. Refer to BRC-158, "CONSULT Function (ABS)".

Is DTC C1116 detected?

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

2.CHECK STOP LAMP SWITCH

Perform the stop lamp switch component inspection. Refer to BRC-180, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 3
NO >> Replace stop lamp switch.

3.CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E26	20	—	Brake pedal depressed	Battery voltage
			Brake pedal released	0V

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".

NO >> GO TO 4

4.CHECK STOP LAMP SWITCH INPUT CIRCUIT

1. Disconnect stop lamp switch connector.
2. Check voltage between stop lamp switch connector E38 terminal 1 and ground.

Stop lamp switch		Ground	Voltage (Approx.)
Connector	Terminal		
E38	1	—	Battery voltage

Is the inspection result normal?

YES >> Repair circuit between stop lamp switch and ABS actuator and electric unit (control unit).

NO >> Repair circuit between fuse block J/B and stop lamp switch.

Diagnosis Procedure (With CVT)

INFOID:0000000007418973

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self diagnostic result. Refer to BRC-158, "CONSULT Function (ABS)".

Is DTC C1116 detected?

YES >> GO TO 2

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

2.CHECK STOP LAMP SWITCH

Perform the stop lamp switch component inspection. Refer to BRC-180, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> GO TO 3

NO >> Replace stop lamp switch.

3.CHECK STOP LAMP RELAY-1

Perform the stop lamp relay-1 component inspection. Refer to BRC-181, "Component Inspection (Stop Lamp Relay)".

Is the inspection result normal?

YES >> GO TO 4

NO >> Replace stop lamp relay-1.

4.CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

1. Connect stop lamp switch and stop lamp relay-1 connectors.

2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.

ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E26	20	—	Brake pedal depressed	Battery voltage
			Brake pedal released	0V

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
NO >> GO TO 5

5.CHECK STOP LAMP RELAY-1 COIL CIRCUIT

1. Disconnect stop lamp relay-1 connector.
2. Check voltage between stop lamp relay-1 connector E57 terminal 1 and ground.

Stop lamp relay-1		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E57	1	—	Brake pedal depressed	Battery voltage
			Brake pedal released	0V

Is the inspection result normal?

YES >> GO TO 6
NO >> Repair circuit between stop lamp switch and stop lamp relay or circuit between fuse block J/B and stop lamp switch.

6.CHECK STOP LAMP RELAY-1 SWITCH INPUT CIRCUIT

Check voltage between stop lamp relay-1 connector E57 terminal 5 and ground.

Stop lamp relay-1		Ground	Voltage (Approx.)
Connector	Terminal		
E57	5	—	Battery voltage

Is the inspection result normal?

YES >> GO TO 7
NO >> Repair circuit between fuse block J/B and stop lamp relay.

7.CHECK STOP LAMP RELAY-1 GROUND CIRCUIT

Check continuity between stop lamp relay-1 connector E57 terminal 2 and ground.

Stop lamp relay-1		Ground	Continuity
Connector	Terminal		
E57	2	—	Yes

Is the inspection result normal?

YES >> Repair circuit between stop lamp relay and ABS actuator and electric unit (control unit).
NO >> Repair stop lamp relay ground circuit.

Component Inspection (Stop Lamp Switch)

INFOID:0000000007418974

1.CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch connector.
3. Check continuity between stop lamp switch terminals.

Stop lamp switch terminals	Condition	Continuity
1 – 2	Brake pedal depressed.	Yes
	Brake pedal released.	No

Is the inspection result normal?

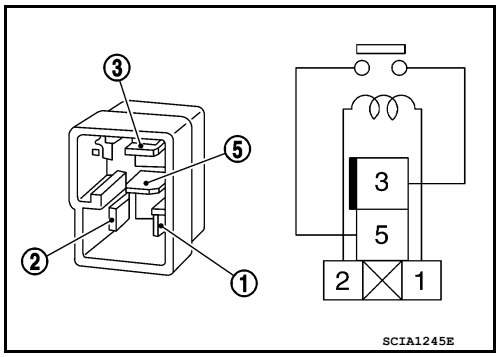
YES >> Inspection End.
NO >> Replace stop lamp switch.

Component Inspection (Stop Lamp Relay)

INFOID:0000000007418975

1.CHECK STOP LAMP RELAY

1. Turn ignition switch OFF.
2. Disconnect stop lamp relay connector.
3. Apply battery voltage to stop lamp relay terminal 1 and ground to terminal 2.
4. Check continuity between stop lamp relay terminals 3 and 5.



Stop lamp relay terminals	Condition	Continuity
3 – 5	Battery voltage applied to terminal 1 and ground to terminal 2	Yes
	Voltage and ground removed	No

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace stop lamp relay.

Special Repair Requirement

INFOID:0000000007418976

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1120, C1122, C1124, C1126 IN ABS SOL

Description

INFOID:0000000007418977

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:0000000007418978

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1120, C1122, C1124 or C1126 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-182, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418979

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000007418980

1. CHECK ACTIVE TEST

1. Select each test menu item on “ACTIVE TEST”.
2. On the display, touch “Up”, “Keep”, and “Down”, and check that the system operates as shown in the table below.

Operation		ABS solenoid valve		
		Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
	FR RH OUT SOL	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*
FR LH SOL	FR LH IN SOL	Off	On	On
	FR LH OUT SOL	Off	Off	On*
	USV [FL-RR]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
	RR RH OUT SOL	Off	Off	On*
	USV [FL-RR]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
	RR LH OUT SOL	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*

*: On for 1 to 2 seconds after the touch, and then Off

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to BRC-182, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007418981

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

INFOID:0000000007418982

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:0000000007418983

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1121, C1123, C1125 or C1127 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-185, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418984

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000007418985

1. CHECK ACTIVE TEST

1. Select each test menu item on “ACTIVE TEST”.
2. On the display, touch “Up”, “Keep”, and “Down”, and check that the system operates as shown in the table below.

Operation		ABS solenoid valve		
		Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
	FR RH OUT SOL	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*
FR LH SOL	FR LH IN SOL	Off	On	On
	FR LH OUT SOL	Off	Off	On*
	USV [FL-RR]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
	RR RH OUT SOL	Off	Off	On*
	USV [FL-RR]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
	RR LH OUT SOL	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*

*: On for 1 to 2 seconds after the touch, and then Off

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to BRC-182, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007418986

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description

INFOID:0000000007418987

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

DTC Logic

INFOID:0000000007418988

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 DIAGNOSTIC RESULT

With CONSULT.

1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1130, C1131, C1132, C1133 or C1136 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-188, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418989

1.CHECK ENGINE SYSTEM

1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to EC-99, "CONSULT Function" (QR25DE) or EC-422, "CONSULT Function" (VQ35DE).
2. Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)"

Is the inspection result normal?

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

DTC C1142 PRESS SEN CIRCUIT

Description

INFOID:0000000007418990

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:0000000007418991

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1142 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-189, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418992

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CHECK STOP LAMP SWITCH CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) and stop lamp switch connectors.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connectors securely.
5. Start engine.
6. Repeat pumping brake pedal carefully several times, and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

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 terminals	Condition	Continuity
1 – 2	Brake pedal depressed.	Yes
	Brake pedal 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) connector E26 terminal 20 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 >> GO TO 4
NO >> Repair or replace malfunctioning components.

4.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1142 detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
NO >> Inspection End.

Component Inspection

INFOID:0000000007418993

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-189, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007418994

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1143, C1144 STEERING ANGLE SENSOR

Description

INFOID:0000000007418995

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:0000000007418996

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 DIAGNOSTIC RESULT

With CONSULT.

1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1143 or C1144 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-191, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007418997

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK STEERING ANGLE SENSOR HARNESS

1. Check CAN communication system. Refer to LAN-15, "Trouble Diagnosis Flow Chart".
2. Turn ignition switch OFF.
3. Disconnect steering angle sensor connector.
4. Check continuity between steering angle sensor connector M53 terminal 1 and ground.

Steering angle sensor		Ground	Continuity
Connector	Terminal		
M53	1	—	Yes

5. Turn ignition switch ON.
6. Check voltage between steering angle sensor connector M53 terminal 4 and ground.

Steering angle sensor		Ground	Voltage (Approx.)
Connector	Terminal		
M53	4	—	Battery voltage

Is the inspection result normal?

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

3.CHECK DATA MONITOR

1. Turn ignition switch OFF.
2. Connect the steering angle sensor and ABS actuator and electric unit (control unit) connectors.
3. Perform the steering angle sensor component inspection. Refer to BRC-192, "Component Inspection".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
NO >> Replace steering angle sensor. Refer to BRC-259, "Removal and Installation".

Component Inspection

INFOID:0000000007418998

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-191, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007418999

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1145, C1146 YAW RATE/SIDE G SENSOR

Description

INFOID:0000000007419000

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:0000000007419001

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1145 or C1146 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-193, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007419002

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

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, SLIP indicator lamp may illuminate and CONSULT 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.**

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect yaw rate/side/decel G sensor and ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is the inspection result normal?

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

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

1. Check voltage between yaw rate/side/decel G sensor connector M55 terminal 4 and ground.

Yaw rate/side/decel G sensor		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
M55	4	—	Ignition switch ON	Battery voltage
			Ignition switch OFF	0V

Is the inspection result normal?

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

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

Check resistance between yaw rate/side/decel G sensor connector M55 terminal 1 and ground.

Yaw rate/side/decel G sensor		Ground	Continuity
Connector	Terminal		
M55	1	—	Yes

Is the inspection result normal?

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

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

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

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	14	M55	2	Yes
	25		3	

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	14	—	No
	25		

Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace malfunctioning components.

5.CHECK DATA MONITOR

1. Connect the Yaw rate/side/decel G sensor and ABS actuator and electric unit (control unit) connectors.
2. Perform the yaw rate/side/decel G sensor component inspection. Refer to BRC-195, "Component Inspection".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-158, "CONSULT Function (ABS)".
NO >> Replace Yaw rate/side/decel G sensor. Refer to BRC-258, "Removal and Installation".

Component Inspection

INFOID:0000000007419003

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-193, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007419004

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1147, C1148, C1149, C1150 USV/HSV LINE

Description

INFOID:0000000007419005

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:0000000007419006

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 DIAGNOSTIC RESULT

With CONSULT.

1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1147, C1148, C1149 or C1150 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-196, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007419007

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK SOLENOID AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.

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

ABS actuator and electric unit (control unit)		Ground	Voltage (Approx)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	1	—	Yes
	4		

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Component Inspection

INFOID:0000000007419008

1. CHECK ACTIVE TEST

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

Operation		ABS solenoid valve (ACT)		
		Up	ACT UP	ACT KEEP
FR RH ABS SOLENOID (ACT)	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
FR LH ABS SOLENOID (ACT)	FR LH IN SOL	Off	Off	Off
	FR LH OUT SOL	Off	Off	Off
	USV [FL-RR]	Off	Off	Off
	HSV [FL-RR]	Off	Off	Off
RR RH ABS SOLENOID (ACT)	RR RH IN SOL	Off	Off	Off
	RR RH OUT SOL	Off	Off	Off
	USV [FL-RR]	Off	Off	Off
	HSV [FL-RR]	Off	Off	Off
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	Off	Off	Off
	RR LH 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

Is the inspection result normal?

YES >> Inspection End
NO >> Go to diagnosis procedure. Refer to BRC-196, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000007419009

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1154 PNP SWITCH

Description

INFOID:0000000007419010

The transmission range switch signal is transmitted to the ABS actuator and electric unit (control unit) using the CAN communication lines.

DTC Logic

INFOID:0000000007419011

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1154 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-199, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007419012

1.CHECK DATA MONITOR

Select “SLCT LVR POSI” in “Data Monitor” and check transmission range switch signal.

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

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> GO TO 2

2.CHECK TRANSMISSION RANGE SWITCH

Perform transmission range switch inspection. Refer to TM-135, "Description" (VQ35DE) or TM-296, "Description" (QR25DE).

Is the inspection result normal?

YES >> • Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.
NO >> • Repair or replace malfunctioning components.
• Perform the self-diagnosis, and make sure that the result shows ″NO DTC IS DETECTED″.

Special Repair Requirement

INFOID:0000000007419013

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

DTC C1155 BR FLUID LEVEL LOW

Description

INFOID:0000000007419014

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:0000000007419015

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 DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1155 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-201, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007419016

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

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

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect brake fluid level switch and combination meter connectors.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminalS.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is the inspection result normal?

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

2.CHECK BRAKE FLUID LEVEL SWITCH

Perform the brake fluid level switch component inspection. Refer to BRC-202, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3
NO >> Replace brake fluid level switch. Refer to BR-22, "Exploded View".

3.CHECK BRAKE FLUID LEVEL SWITCH HARNESS

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

27 - 1 : Continuity should exist.

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

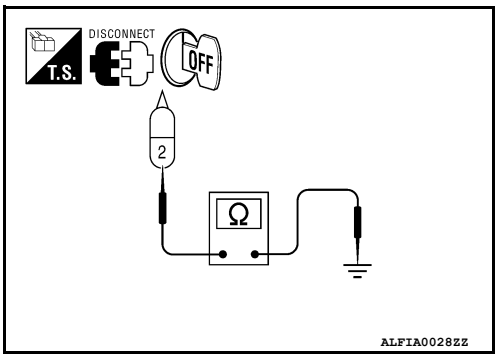
27 - Ground : Continuity should not exist.

Is the inspection result normal?

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

4.CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

Check continuity between brake fluid level switch connector E24 Sterminal 2 and ground.



2 - Ground : Continuity should exist.

Is the inspection result normal?

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

Component Inspection

INFOID:0000000007419017

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:0000000007419018

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

DTC C1156 ST ANG SEN COM CIR

Description

INFOID:0000000007419019

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:0000000007419020

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 DIAGNOSTIC RESULT

With CONSULT.

1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC C1156 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-203, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007419021

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is DTC C1156 detected?

YES >> Refer to LAN-15, "Trouble Diagnosis Flow Chart".
NO >> Inspection End.

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000007419022

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:0000000007419023

DTC DETECTION LOGIC

DTC	Display	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 system malfunction

DTC CONFIRMATION PROCEDURE

1.CHECK SELF DIAGNOSTIC RESULT

With CONSULT.
1. Turn the ignition switch OFF to ON.
2. Perform self diagnostic result.

Is DTC U1000 detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-204, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000007419024

1.CONNECTOR INSPECTION

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

Is DTC U1000 detected?

YES >> Refer to LAN-15, "Trouble Diagnosis Flow Chart".
NO >> Inspection End.

PARKING BRAKE SWITCH

Description

INFOID:0000000007419025

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:0000000007419026

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-205, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007419027

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

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 terminal 26 and parking brake switch harness connector E35 (with CVT) or M73 (with M/T) terminal 1.

26 - 1 : Continuity should exist.

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

26 - Ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair harness or connector.

2.CHECK PARKING BRAKE SWITCH

Perform the parking brake switch component inspection. Refer to BRC-205, "Component Inspection".

Is the inspection result normal?

YES >> Check parking brake switch case ground condition.
NO >> Replace parking brake switch.

Component Inspection

INFOID:0000000007419028

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 terminal	Ground	Condition	Continuity
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.

Special Repair Requirement

INFOID:0000000007419029

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

VDC OFF SWITCH

Description

INFOID:0000000007419030

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

Component Function Check

INFOID:0000000007419031

1.CHECK VDC OFF SWITCH OPERATION

Press and release the VDC OFF switch, then press and release the VDC OFF switch again and check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly.

Condition	VDC OFF indicator lamp illumination status
VDC OFF switch: pressed and released	ON
VDC OFF switch: pressed and released	OFF

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to BRC-207, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007419032

Regarding Wiring Diagram information, refer to BRC-223, "Wiring Diagram - Coupe" or BRC-232, "Wiring Diagram - Sedan With VDC".

1.CHECK VDC OFF SWITCH

Perform the VDC OFF switch component inspection. Refer to BRC-208, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2
NO >> 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 terminal 21 and VDC OFF switch connector M72 terminal 1.

ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E26	21	M72	1	Yes

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	21	—	No

Is the inspection result normal?

YES >> GO TO 3
NO >> Repair or replace malfunctioning components.

3.CHECK VDC OFF SWITCH GROUND

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

VDC OFF switch		Ground	Continuity
Connector	Terminal		
M72	2	—	Yes

Is the inspection result normal?

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

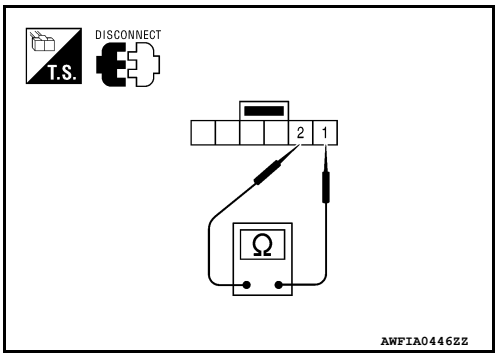
Component Inspection

INFOID:0000000007419033

1.CHECK VDC OFF SWITCH

1. Disconnect VDC OFF switch connector.
2. Check continuity between VDC OFF switch terminals.

VDC OFF switch terminals	Condition	Continuity
1, 2	VDC OFF switch pressed	Yes
	VDC OFF switch released	No



Is the inspection result normal?

YES >> Inspection End.
NO >> Replace VDC OFF switch.

Special Repair Requirement

INFOID:0000000007419034

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

ABS WARNING LAMP

Description

INFOID:0000000007419035

×: ON –: OFF

Condition	ABS warning lamp
Ignition switch OFF	–
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	–
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000007419036

1.CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to BRC-209, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007419037

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-158, "CONSULT 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-4, "Work Flow".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-139, "Removal and Installation".

Special Repair Requirement

INFOID:0000000007419038

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

BRAKE WARNING LAMP

Description

INFOID:0000000007419039

×: ON –: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	–
Ignition switch ON	× (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:0000000007419040

1.BRAKE WARNING LAMP OPERATION CHECK 1

Check that the lamp illuminates after the ignition switch is turned ON, and turns OFF after the engine is started.

Is the inspection result normal?

YES >> GO TO 2
NO >> Go to diagnosis procedure. Refer to BRC-210, "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 BR-13, "Inspection and Adjustment".

Diagnosis Procedure

INFOID:0000000007419041

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 BR-13, "Inspection and Adjustment".

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-158, "CONSULT 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-4, "Work Flow".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-139, "Removal and Installation".

Special Repair Requirement

INFOID:0000000007419042

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

VDC OFF INDICATOR LAMP

Description

INFOID:0000000007419043

×: ON –: OFF

Condition	VDC OFF indicator lamp
Ignition switch OFF	–
For 2 seconds after turning ON ignition switch	×
2 seconds 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:0000000007419044

1.VDC OFF INDICATOR LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2
NO >> Go to diagnosis procedure. Refer to BRC-212, "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-207, "Description".

Diagnosis Procedure

INFOID:0000000007419045

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-207, "Diagnosis Procedure".

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-158, "CONSULT 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-4, "Work Flow".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-139, "Removal and Installation".

Special Repair Requirement

INFOID:0000000007419046

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

SLIP INDICATOR LAMP

Description

INFOID:0000000007419047

×: ON –: OFF

Condition	SLIP indicator lamp
Ignition switch OFF	–
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	–
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000007419048

1.CHECK SLIP INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to BRC-214, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007419049

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-158, "CONSULT 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-4, "Work Flow".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-139, "Removal and Installation".

Special Repair Requirement

INFOID:0000000007419050

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-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000007419051

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	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
FR RH SENSOR	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
RR LH SENSOR	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
RR RH SENSOR	Wheel speed	0 [km/h, mph]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
FR LH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) or actuator relay is inactive (in fail-safe mode)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR RH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) 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

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FR RH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) 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
RR LH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) 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
RR LH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) 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
RR RH IN SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) 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
RR RH OUT SOL	Operation status of all solenoid valves	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT) 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
STOP LAMP SW	Brake pedal operation	When brake pedal is depressed	ON
		When brake pedal is not depressed	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

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
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
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
SLIP LAMP	SLIP indicator lamp (Note 3)	When SLIP indicator lamp is ON	ON
		When SLIP indicator lamp is OFF	OFF
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
GEAR	Manual mode gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear 6th gear	1 2 3 4 5 6
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
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
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
USV[FL-RR]	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT) 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
USV[FR-RL]	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT) 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

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
HSV[FL-RR]	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT) 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
HSV[FR-RL]	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT) 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)	ON
		When the actuator motor and motor relay are inactive	OFF
ENGINE RPM	With engine running	With engine stopped	0 rpm
		Engine running	Almost in accordance with tachometer display

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-209, "Description" (ABS), BRC-212, "Description" (VDC OFF) or BRC-214, "Description" (SLIP).

Fail-Safe

INFOID:0000000007419052

ABS, EBD SYSTEM

In case of electrical malfunctions with the ABS, ABS warning lamp and SLIP indicator lamp will turn on. In case of electrical malfunctions with the EBD, brake warning lamp, ABS warning 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 VDC/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 VDC/TCS/ABS, EBD system.

VDC / TCS

In case of malfunction in the VDC/TCS/ABS system, SLIP indicator lamp is 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:0000000007419053

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-162, "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-165, "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-168, "Diagnosis Procedure"
CONTROLLER FAILURE [C1110]	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-170, "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-171, "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-173, "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-175, "Diagnosis Procedure" (Note 1)
STOP LAMP SW [C1116]	When stop lamp switch circuit is open.	BRC-178, "Diagnosis Procedure (With M/T)" BRC-179, "Diagnosis Procedure (With CVT)"

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-182, "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-185, "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-188, "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-189, "Diagnosis Procedure"
ST ANG SEN CIRCUIT [C1143]	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	BRC-191, "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-193, "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-196, "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-170, "Diagnosis Procedure"
PNP POS SIG [C1154]	TCM or ABS actuator and electric unit (control unit) internal malfunction.	BRC-199, "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-201, "Diagnosis Procedure"
ST ANG SEN COM CIR [C1156]	CAN communication circuit or steering angle sensor is malfunctioning.	BRC-203, "Diagnosis Procedure"

Display item	Malfunction detecting condition	Check item
VARIANT CODING [C1170]	In a case where VARIANT CODING is different.	BRC-170, "Diagnosis Procedure"
CAN COMM CIRCUIT [U1000]	When there is a malfunction in the CAN communication circuit.	BRC-204, "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.

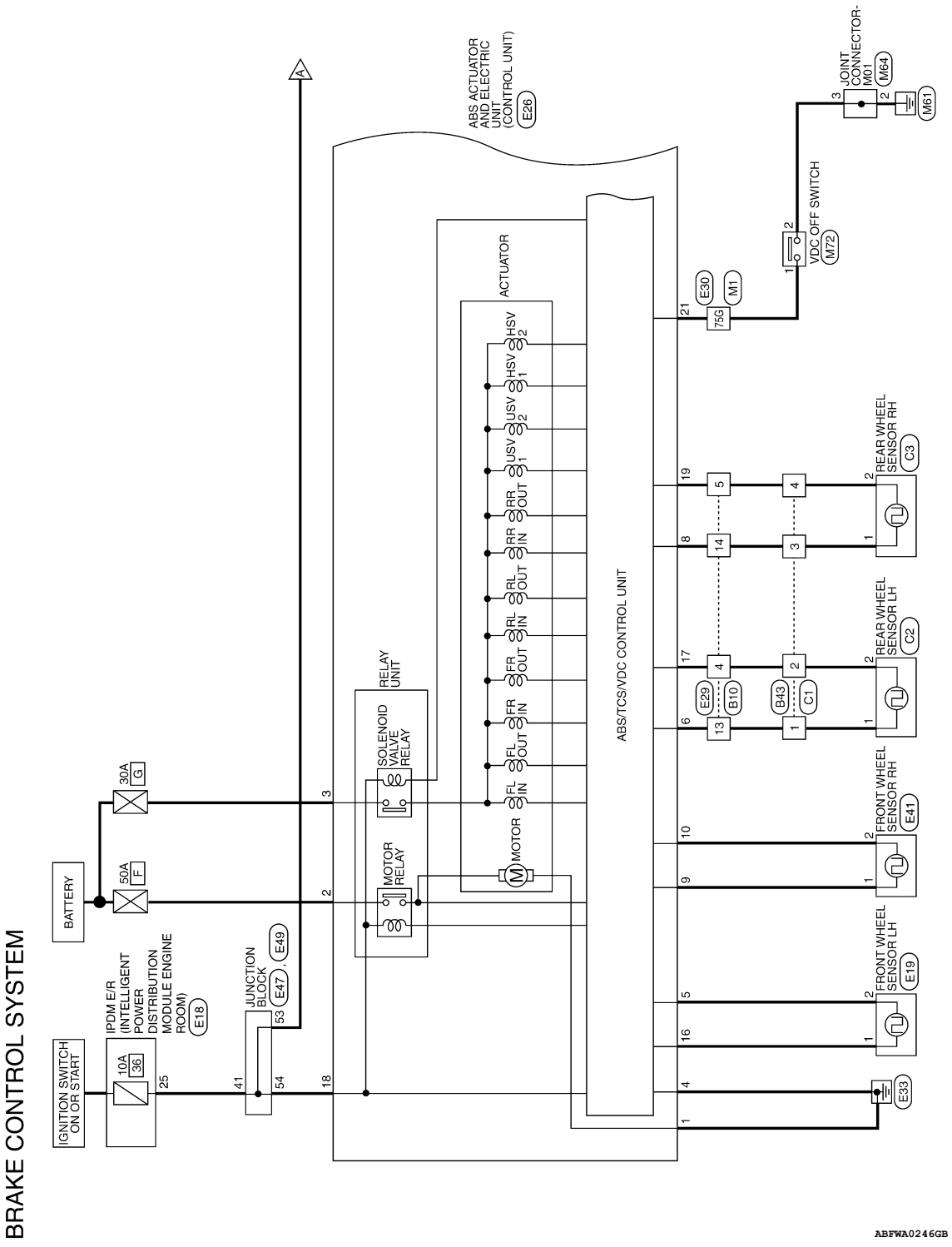
Note 2: When malfunctions are detected in several systems, including CAN communication circuit [U1000], troubleshoot CAN communication circuit. Refer to BRC-204, "Diagnosis Procedure".

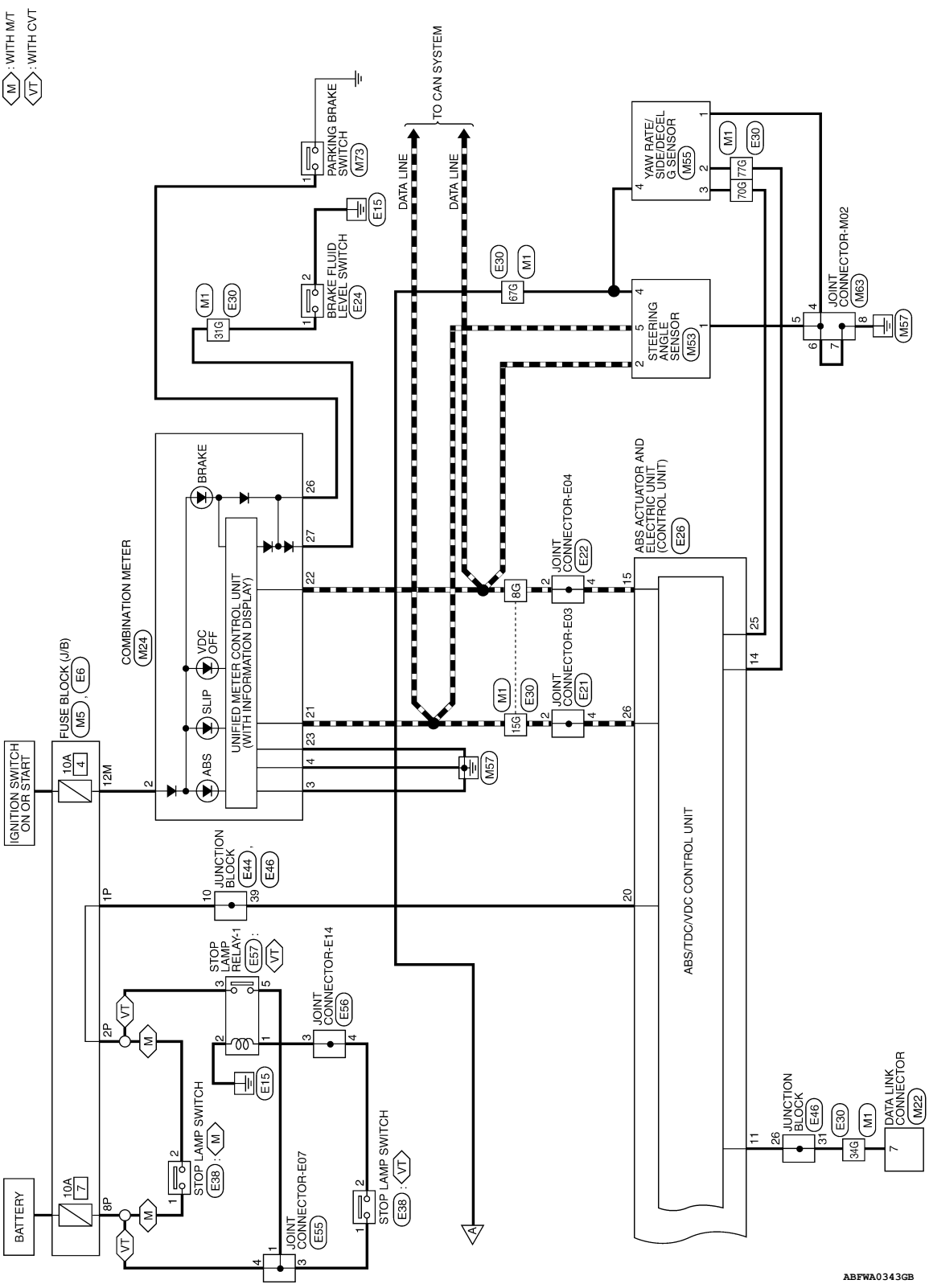
WIRING DIAGRAM

BRAKE CONTROL SYSTEM

Wiring Diagram - Coupe

INFOID:0000000007419054

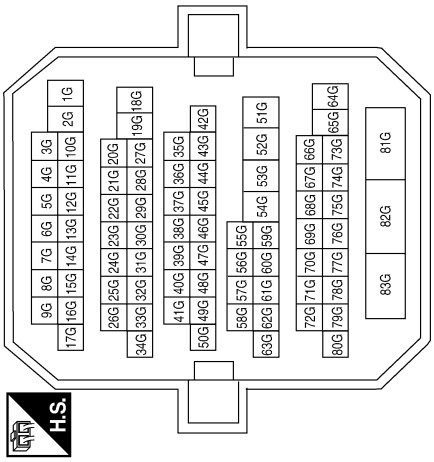



M : WITH M/T
VT : WITH CVT
TO CAN SYSTEM
DATA LINE
DATA LINE
PARKING BRAKE SWITCH M73
BRAKE FLUID LEVEL SWITCH E24
E15
YAW RATE/ SIDE/DECEL G SENSOR M55
STEERING ANGLE SENSOR M53
JOINT CONNECTOR-M02 M63
M57
COMBINATION METER M24
UNIFIED METER CONTROL UNIT (WITH INFORMATION DISPLAY)
BRAKE
VDC OFF
SLIP
ABS
JOINT CONNECTOR-E04 E22
JOINT CONNECTOR-E03 E21
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) E26
ABS/TDC/VDC CONTROL UNIT
FUSE BLOCK (J/B) M5, E6
IGNITION SWITCH ON OR START
BATTERY
JUNCTION BLOCK E44, E46
STOP LAMP RELAY-1 E57 : VT
STOP LAMP SWITCH E38 : M
STOP LAMP SWITCH E38 : VT
JOINT CONNECTOR-E14 E56
JOINT CONNECTOR-E07 E55
JUNCTION BLOCK E46
DATA LINK CONNECTOR M22
A
ABFWA0343GB

BRAKE CONTROL SYSTEM CONNECTORS

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

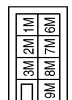
H.S.



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

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

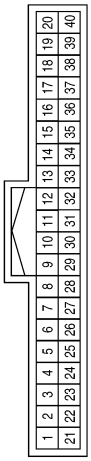
H.S.



Terminal No.	Color of Wire	Signal Name
12M	O	–

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

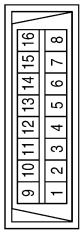
H.S.



Terminal No.	Color of Wire	Signal Name
2	O	IGN
3	B	GND (POWER)
4	B	GND (ILL)
21	L	CAN-H
22	P	CAN-L
23	B	GND (CIRCUIT)
26	G/R	PKB
27	V	BRAKE OIL IN

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

H.S.



Terminal No.	Color of Wire	Signal Name
7	O	–

ABFIA0331GB

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

H.S.

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

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	–
6	B	–
7	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
Connector Color	BLACK

H.S.

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

ABFIA0682GB

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	Y	–
8P	R	–

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	W	–
2	V	–

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	–

AAFIA0088GB

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

H.S.

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

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	UB (MR)
3	R	UB (VR)
4	B	GND
5	V	DS FL
6	G	DP RL
7	–	–
8	L	DP RR
9	B	DP FR
10	LG	DS FR
11	GR	DIAG-K
12	–	–
13	–	–
14	O	CAN-M2
15	P	CAN-L
16	W	DP FL
17	O	DS RL
18	GR	UZ
19	BR	DS RR
20	SB	BLS
21	R	ASR AUS
22	–	–
23	–	–
24	–	–
25	B	CAN-P2
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	O	–
5	BR	–
13	G	–
14	L	–

ABFIA0334GB

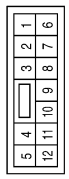
Connector No.	E38
Connector Name	STOP LAMP SWITCH (WITH CVT)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	R	–
2	LG	–

Connector No.	E44
Connector Name	JUNCTION BLOCK
Connector Color	BROWN

H.S.

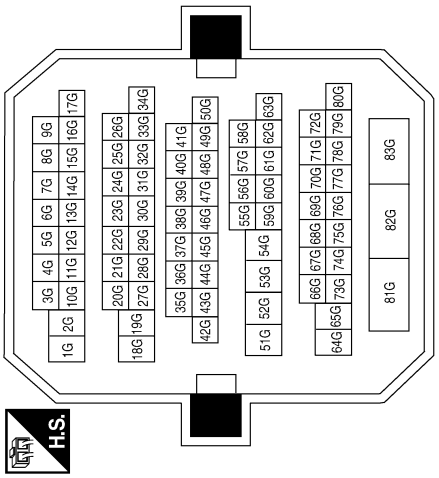


Terminal No.	Color of Wire	Signal Name
10	SB	–

Terminal No.	Color of Wire	Signal Name
8G	P	–
15G	L	–
31G	V	–
34G	O	–
67G	W	–
70G	B	–
75G	R	–
77G	O	–

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

H.S.



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

H.S.

Terminal No.	Color of Wire	Signal Name
1	B	–
2	LG	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	R	–
2	LG	–

ABFIA0335GB

Connector No.	E46
Connector Name	JUNCTION BLOCK
Connector Color	WHITE

H.S.

31	30	29	28		27	26	25
40	39	38	37	36	35	34	33	32

Terminal No.	Color of Wire	Signal Name
26	GR	–
31	O	–
39	SB	–

Connector No.	E47
Connector Name	JUNCTION BLOCK
Connector Color	WHITE

H.S.

42		41
46	45	44	43

Terminal No.	Color of Wire	Signal Name
41	GR	–

Connector No.	E49
Connector Name	JUNCTION BLOCK
Connector Color	BROWN

H.S.

54	53	52	51

Terminal No.	Color of Wire	Signal Name
53	W	–
54	GR	–

Connector No.	E55
Connector Name	JOINT CONNECTOR-E07
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of Wire	Signal Name
1	W	–
3	R	–
4	R	–

Connector No.	E56
Connector Name	JOINT CONNECTOR-E14
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of Wire	Signal Name
3	LG	–
4	LG	–

Connector No.	E57
Connector Name	STOP LAMP RELAY-1
Connector Color	BLUE

H.S.

3	
5	
2	1

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	B	–
3	Y	–
5	W	–

AAFIA0089GB

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–
3	LG	–
4	BR	–

Connector No.	C2
Connector Name	REAR WHEEL SENSOR LH
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–

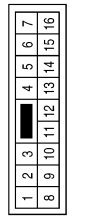
Connector No.	C3
Connector Name	REAR WHEEL SENSOR RH
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	BR	–

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

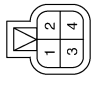
H.S.



Terminal No.	Color of Wire	Signal Name
4	O	–
5	BR	–
13	G	–
14	LG	–

Connector No.	B43
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

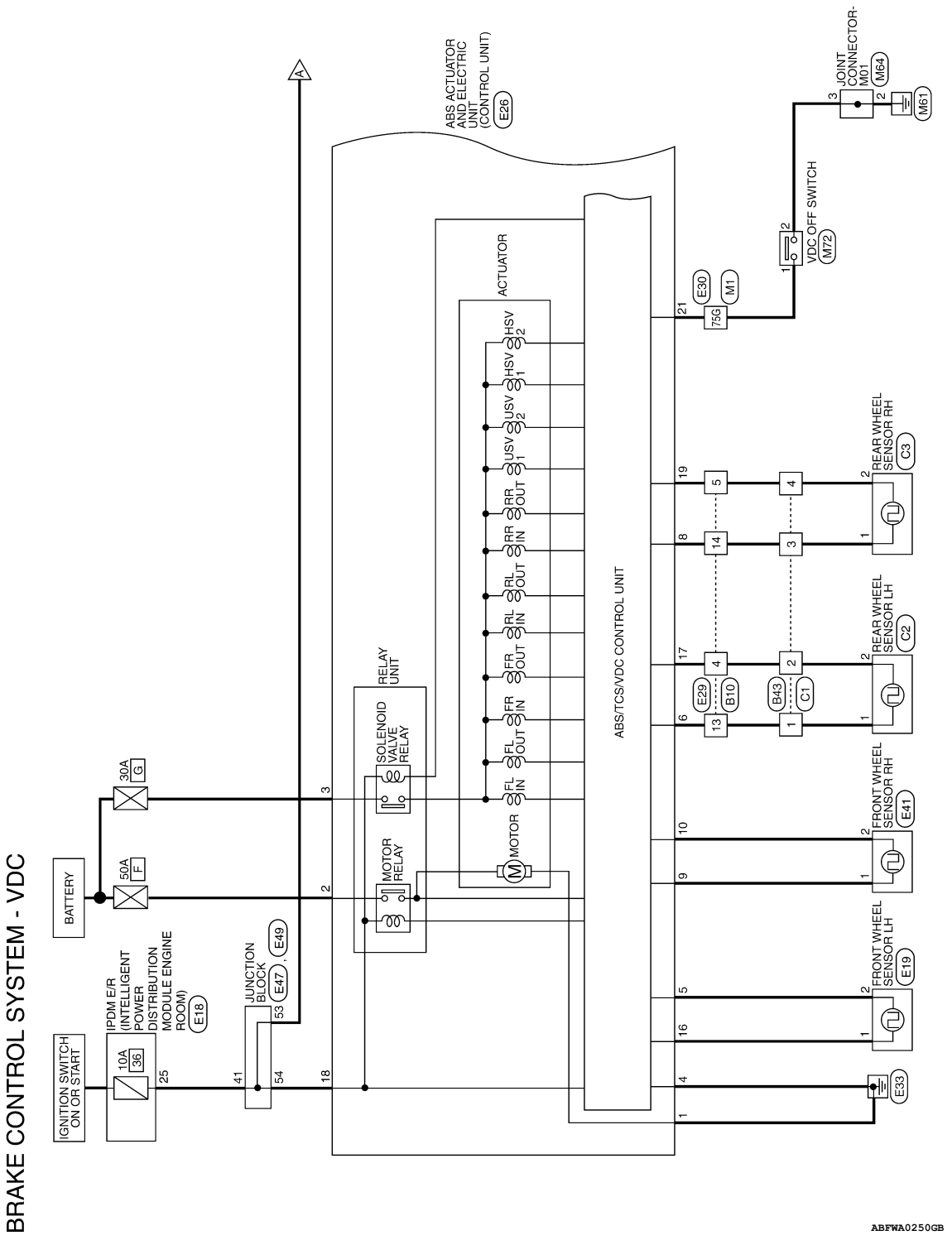


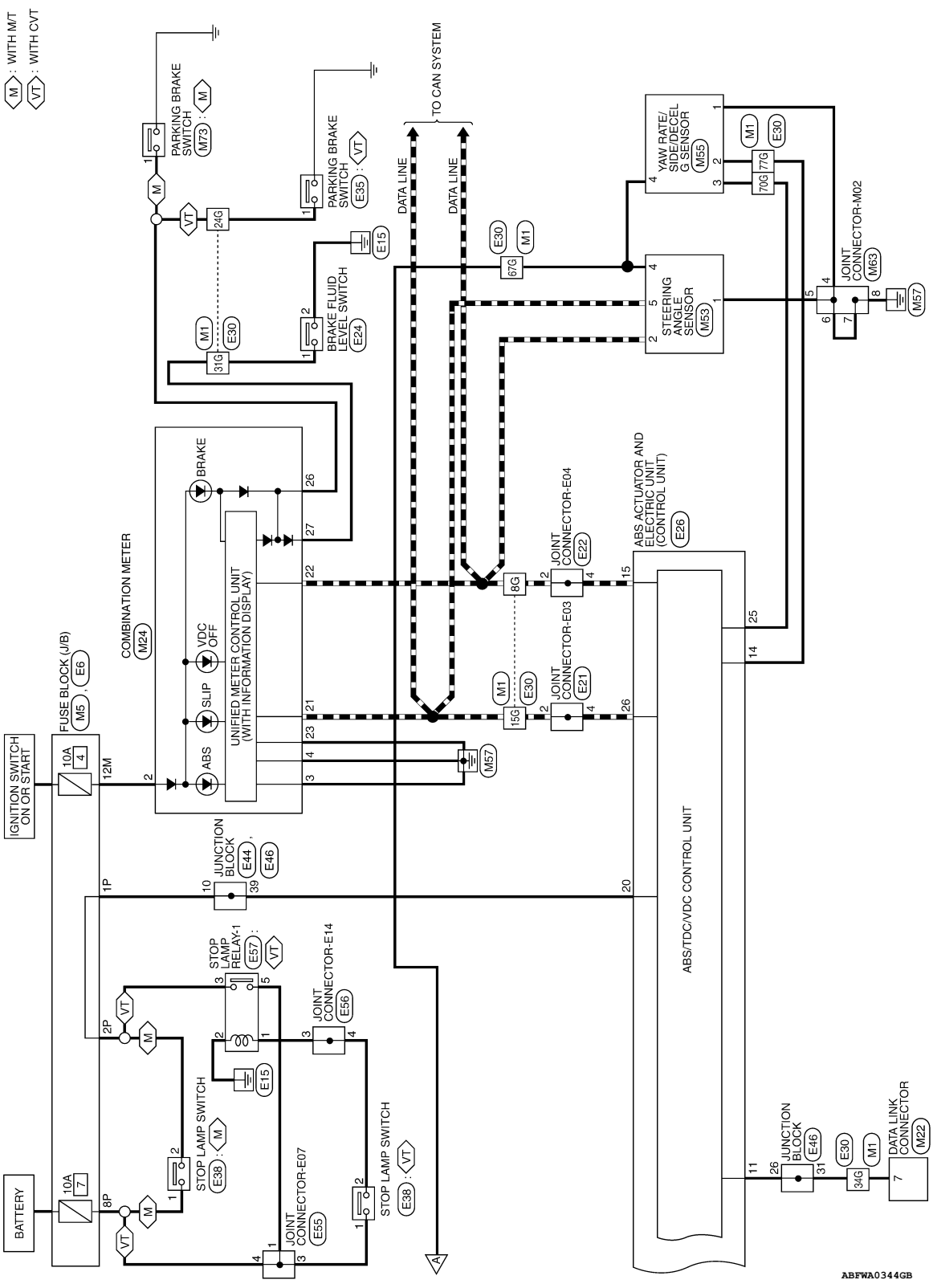
Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–
3	LG	–
4	BR	–

AAFIA0090GB

Wiring Diagram - Sedan With VDC

INFOID:0000000007419055

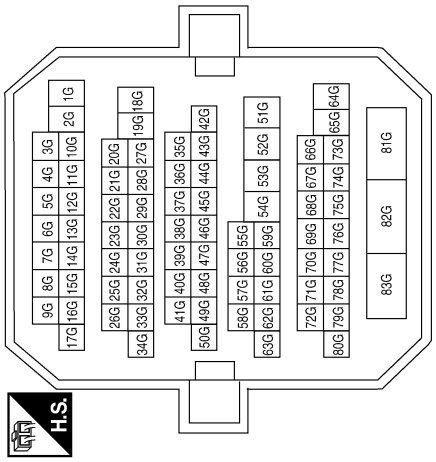



M : WITH M/T
VT : WITH CVT
PARKING BRAKE SWITCH (M73) : M
PARKING BRAKE SWITCH (E35) : VT
BRAKE FLUID LEVEL SWITCH (E24)
TO CAN SYSTEM
DATA LINE
DATA LINE
YAW RATE/ SIDE/DECEL G SENSOR (M55)
STEERING ANGLE SENSOR (M53)
JOINT CONNECTOR-M02 (M63)
COMBINATION METER (M24)
UNIFIED METER CONTROL UNIT (WITH INFORMATION DISPLAY)
BRAKE
VDC OFF
SLIP
ABS
JOINT CONNECTOR-E04 (E22)
JOINT CONNECTOR-E03 (E21)
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (E26)
ABS/TDC/VDC CONTROL UNIT
FUSE BLOCK (J/B) (M5) : (E6)
IGNITION SWITCH ON OR START
BATTERY
JUNCTION BLOCK (E44) : (E46)
STOP LAMP RELAY-1 (E57) : VT
JOINT CONNECTOR-E14 (E56)
JOINT CONNECTOR-E07 (E55)
STOP LAMP SWITCH (E38) : M
STOP LAMP SWITCH (E38) : VT
JUNCTION BLOCK (E46)
DATA LINK CONNECTOR (M22)
ABFWA0344GB

BRAKE CONTROL SYSTEM CONNECTORS - VDC

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

H.S.



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

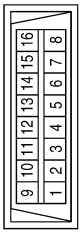
Connector No.	M5
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
12M	O	–

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

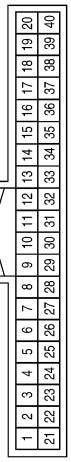
H.S.



Terminal No.	Color of Wire	Signal Name
7	O	–

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 (POWER)
4	B	GND (ILL)
21	L	CAN-H
22	P	CAN-L
23	B	GND (CIRCUIT)
26	G/R	PKB
27	V	BRAKE OIL IN

ABFIA0348GB

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

H.S.

1	2	3	4
5	6	7	8

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

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

H.S.

4	
3	2
1	

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.

12	11	10	9	8	7	6	5	4	3	2	1

Terminal No.	Color of Wire	Signal Name
4	B	–
5	B	–
6	B	–
7	B	–
8	B	–

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

H.S.

6	5	4	3	2	1

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

Connector No.	M72
Connector Name	VDC 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.	M73
Connector Name	PARKING BRAKE SWITCH (WITH M/T)
Connector Color	BLACK

H.S.

1

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

ABFIA0683GB

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	LG	– (WITH MT)
2P	Y	– (WITH CVT)
8P	R	–

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	W	–
2	V	–

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	–

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Terminal No.	Color of Wire	Signal Name
9	B	DP FR
10	LG	DS FR
11	GR	DIAG-K
12	–	–
13	–	–
14	O	CAN-M2
15	P	CAN-L
16	W	DP FL
17	O	DS RL
18	GR	UZ
19	BR	DS RR
20	SB	BLS
21	R	ASR AUS
22	–	–
23	–	–
24	–	–
25	B	CAN-P2
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	UB (MR)
3	R	UB (VR)
4	B	GND
5	V	DS FL
6	G	DP RL
7	–	–
8	L	DP RR

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

H.S.

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

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

H.S.

Terminal No.	Color of Wire	Signal Name
4	O	–
5	BR	–
13	G	–
14	L	–

ABFIA0351GB

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

H.S.

Terminal No.	Color of Wire	Signal Name
8G	P	–
15G	L	–
24G	P	–
31G	V	–
34G	O	–
67G	W	–
70G	B	–
75G	R	–
77G	O	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	R	–
2	LG	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	R	–
2	LG	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	B	–
2	LG	–

ABFIA0352GB

Connector No.	E44
Connector Name	JUNCTION BLOCK
Connector Color	BROWN

H.S.

5	4		3	2	1
12	11	10	9	8	7	6

Terminal No.	Color of Wire	Signal Name
10	SB	–

Connector No.	E46
Connector Name	JUNCTION BLOCK
Connector Color	WHITE

H.S.

31	30	29	28		27	26	25
40	39	38	37	36	35	34	33	32

Terminal No.	Color of Wire	Signal Name
26	GR	–
31	O	–
39	SB	–

Connector No.	E47
Connector Name	JUNCTION BLOCK
Connector Color	WHITE

H.S.

42		41
46	45	44	43

Terminal No.	Color of Wire	Signal Name
41	GR	–

Connector No.	E49
Connector Name	JUNCTION BLOCK
Connector Color	BROWN

H.S.

54	53	52	51

Terminal No.	Color of Wire	Signal Name
53	W	–
54	GR	–

Connector No.	E55
Connector Name	JOINT CONNECTOR-E07
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of Wire	Signal Name
1	W	–
3	R	–
4	R	–

Connector No.	E56
Connector Name	JOINT CONNECTOR-E14
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of Wire	Signal Name
3	LG	–
4	LG	–

AAFIA0092GB

Connector No.	E57
Connector Name	STOP LAMP RELAY-1
Connector Color	BLUE

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	B	–
3	Y	–
5	W	–

Connector No.	C3
Connector Name	REAR WHEEL SENSOR RH
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	BR	–

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–
3	LG	–
4	BR	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
4	O	–
5	BR	–
13	G	–
14	LG	–

Connector No.	C2
Connector Name	REAR WHEEL SENSOR LH
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–

Connector No.	B43
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	–
2	O	–
3	LG	–
4	BR	–

AAFIA0093GB

SYMPTOM DIAGNOSIS

VDC/TCS/ABS

Symptom Table

INFOID:0000000007419056

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

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-242, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-243, "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-244, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-245, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-246, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-247, "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:0000000007419057

1.CHECK START

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

Is the inspection result normal?

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

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles. Refer to front: FAX-6, "Inspection", Rear: RAX-6, "On-vehicle Service".

Is the inspection result normal?

YES >> GO TO 3
NO >> Repair or replace malfunctioning components.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following.
- Wheel sensor installation for damage.
- Sensor rotor installation for damage.
- Wheel sensor connector connection.
- Wheel sensor harness inspection.

Is the inspection result normal?

YES >> GO TO 4
NO >>
- Replace wheel sensor or sensor rotor. Refer to BRC-253, "Removal and Installation" or BRC-255, "Removal and Installation".
- Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000007419058

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-13, "Inspection and Adjustment".

Is the stroke too big?

YES >> • Bleed air from brake tube and hose. Refer to BR-16, "Bleeding Brake System".
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal: BR-13, "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.

Is the inspection result normal?

YES >> Inspection End.
NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000007419059

CAUTION:

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

1.CHECK FUNCTION

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000007419060

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

1. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned on or when driving.

Is the inspection result normal?

YES >> Inspection End.
NO >> Perform self-diagnosis. Refer to BRC-158, "CONSULT Function (ABS)".

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000007419061

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 that there are pedal vibrations when the engine is started.

Do symptoms occur?

YES >> GO TO 2
NO >> Inspect the brake pedal.

2.SYMPTOM CHECK 2

Check that there are ABS operation noises when the engine is started.

Do symptoms occur?

YES >> GO TO 3
NO >> Perform self diagnostic result. Refer to BRC-158, "CONSULT Function (ABS)".

3.SYMPTOM CHECK 3

Check symptoms when electrical component (headlamps, etc.) switches are operated.

Do symptoms occur?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.
NO >> Inspection End.

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000007419062

1.SYMPTOM CHECK

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

Is the inspection result normal?

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

2.CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnostic of ABS actuator and electric unit (control unit). Refer to BRC-158, "CONSULT Function (ABS)".

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. Refer to BRC-158, "CONSULT Function (ABS)".

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. Refer to EC-99, "CONSULT Function" (QR25DE), EC-422, "CONSULT Function" (VQ35DE) or TM-123, "CONSULT Function (TRANSMISSION)".

Are self-diagnosis results indicated?

YES >> Check the corresponding items.
- ECM: Refer to EC-99, "CONSULT Function" (QR25DE) or EC-422, "CONSULT Function" (VQ35DE).
- CVT: Refer to TM-123, "CONSULT Function (TRANSMISSION)".

NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-256, "Removal and Installation".

NORMAL OPERATING CONDITION

Description

INFOID:0000000007419063

Symptom	Result
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.	This is a normal condition due to the VDC, 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 or VDC is activated due to rapid acceleration or sharp turn.	
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because TCS 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.
VDC may not operate normally or the ABS warning lamp and SLIP indicator lamp may illuminate, when running on a special road that is extremely slanted (e.g. bank in a circuit course).	
A malfunction may occur in the yaw rate/side/decel G sensor system, when the vehicle turns sharply, such as during a spin turn, axle turn, or drift driving, while the VDC function is off (VDC OFF indicator lamp illuminated).	
The vehicle speed will not increase even though the accelerator pedal is depressed, when inspecting the speedometer on a 2-wheel chassis dynamometer.	Normal (Deactivate the VDC/TCS function before performing an inspection on a chassis dynamometer.)
SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a VDC system error but results from characteristic change of tire.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000007419064

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

WARNING:

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

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

WARNING:

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

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000007419065

NOTE:

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

This vehicle is equipped with a push-button ignition switch and a steering lock unit.
If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

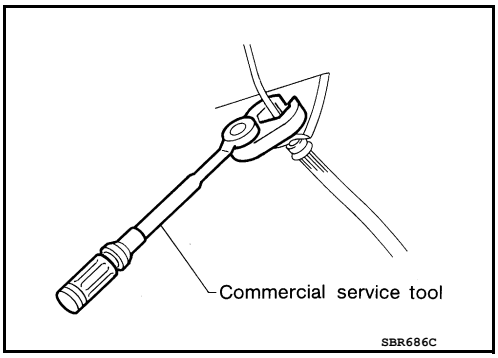
1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Brake System

INFOID:0000000007419066

- Recommended fluid is brake fluid “DOT 3”.
- Do not 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.
- Do not 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:0000000007419067

- 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.

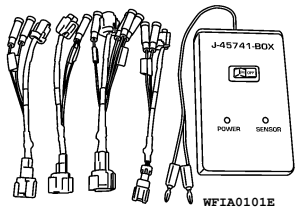
PREPARATION

PREPARATION

Special Service Tool

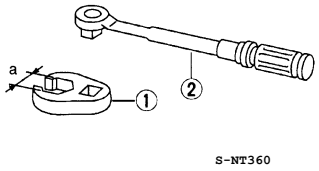
INFOID:0000000007419068

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 	Checking operation of ABS active wheel sensor

Commercial Service Tool

INFOID:0000000007419069

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

REMOVAL AND INSTALLATION

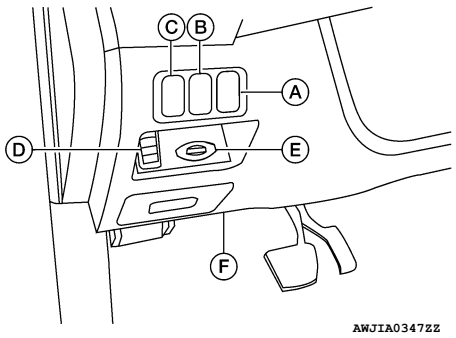
VDC OFF SWITCH

Removal and Installation

INFOID:0000000007419070

REMOVAL

1. Remove instrument lower cover to access the VDC OFF switch. Refer to IP-11, "Exploded View".
2. Disconnect the following harness connectors to remove instrument lower cover:
   - Headlamp aiming (A)
   - Rear sonar system off switch (B)
   - VDC OFF (C)
   - Trunk release (D)
   - Key slot (E)
   - Diagnostic connector (F)
   - Aspirator tube
3. Remove VDC OFF switch from the back of the instrument lower cover.



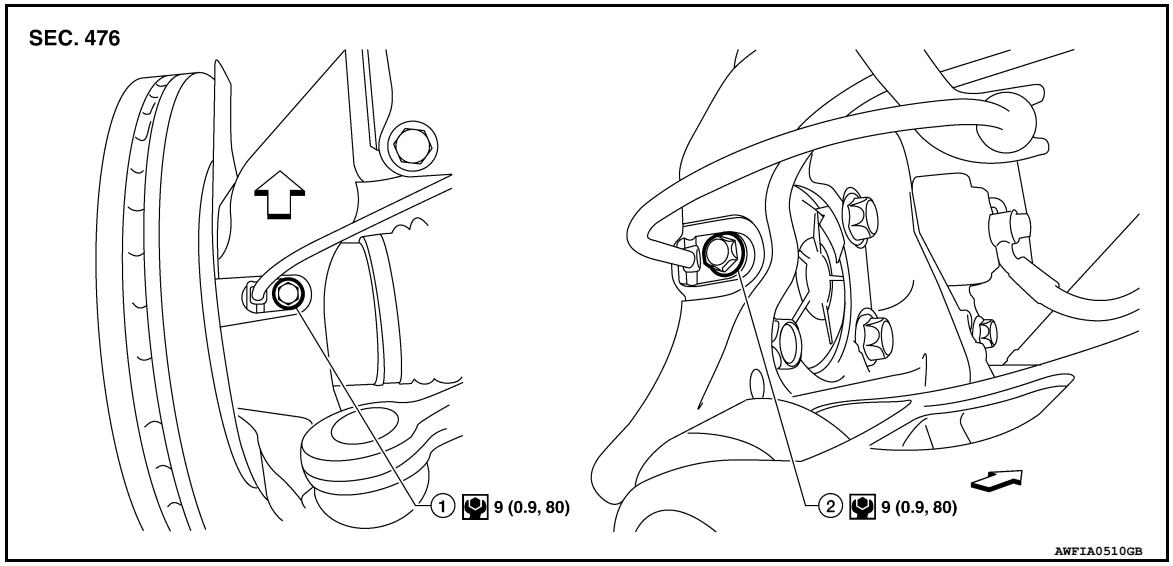
INSTALLATION

Installation is in the reverse order of removal.

WHEEL SENSORS

Removal and Installation

INFOID:0000000007419071



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, first remove the wheel sensor from the wheel hub. Failure to do so may result in damage to the wheel sensor wires making the sensor inoperative.**
- **Pull out the wheel sensor, being careful to turn it as little as possible. Do not pull on the wheel sensor harness.**
- **Before installation, 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 in the wheel hub for the wheel sensor, or if a foreign object is caught in the surface of the mating surface for the sensor rotor. Fix as necessary and then install the wheel sensor.**

FRONT WHEEL SENSOR

Removal

1. Remove front wheel and tire. Refer to WT-68, "Adjustment".
2. Partially remove front wheel fender protector. Refer to EXT-22, "Removal and Installation" (Coupe), EXT-46, "Removal and Installation" (Sedan).
3. Remove wheel sensor bolt and wheel sensor.
4. Remove harness wire from mounts and disconnect wheel sensor harness connector.

Installation

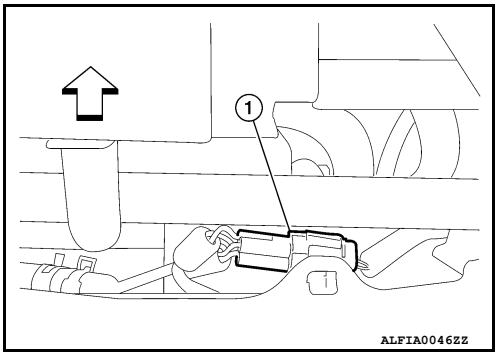
Installation is in the reverse order of removal.

REAR WHEEL SENSOR

Removal

1. Remove rear wheel and tire. Refer to WT-68, "Adjustment".

2. Disconnect wheel sensor harness connector (1).
   - ⇦: Front
3. Remove harness wire clips from rear suspension member.
4. Remove wheel sensor bolt and wheel sensor from rear wheel hub and bearing assembly.



Installation
Installation is in the reverse order of removal.

SENSOR ROTOR

Removal and Installation

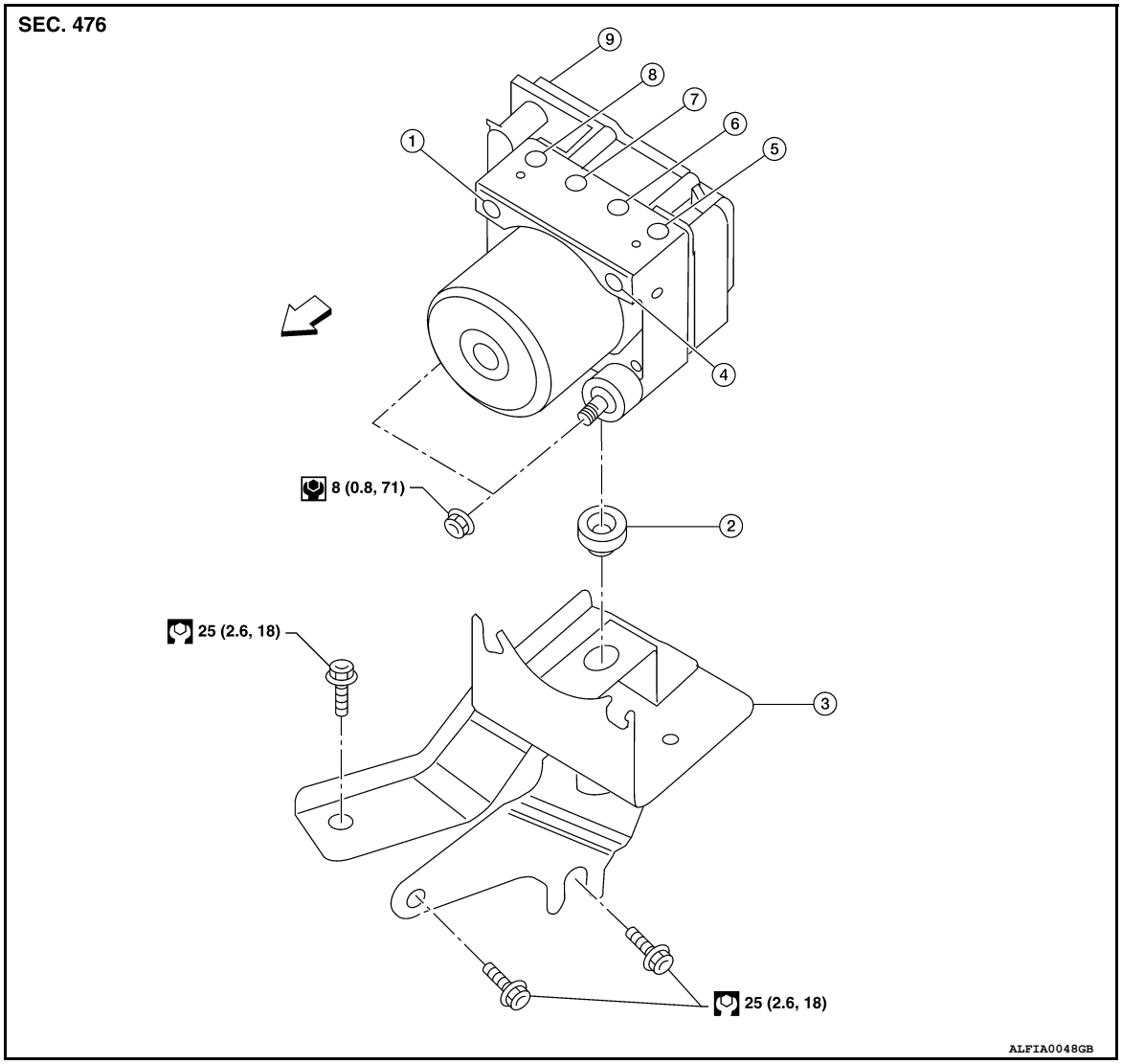
INFOID:0000000007419072

The front and rear wheel sensor rotors are an integral part of the wheel hubs and can not be disassembled. When replacing the sensor rotor, replace the wheel hub. Refer to FAX-8, "Removal and Installation" (front), RAX-7, "Removal and Installation" (rear).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:0000000007419073



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 (control unit)

⇦ Front

Removal and Installation

INFOID:0000000007419074

CAUTION:

Be careful of the following.

- **Before servicing, disconnect the battery cable from negative terminal.**
- **To remove brake pipe, use a suitable tool (flare nut wrench) to prevent flare nuts and brake tube from being damaged. To install, use suitable tool (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 ABS actuator and electric unit (control unit) by holding harness.**
- **After work is completed, bleed air from brake tube. Refer to BR-16, "Bleeding Brake System".**
- **After installing harness connector on the ABS actuator and electric unit (control unit), make sure connector is securely locked.**

REMOVAL

NOTE:
When removing components such as hoses tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Remove cowl top. Refer to EXT-21, "Removal and Installation" (Coupe), EXT-45, "Removal and Installation" (Sedan).
2. Disconnect washer hose.
3. Disconnect the battery negative terminal.
4. Remove tower bar, if equipped. Refer to FSU-14, "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) using a suitable tool.
7. Remove ABS actuator and electric unit (control unit) nuts.
8. Remove ABS actuator and electric unit (control unit).
9. Remove bracket as necessary.

INSTALLATION

Installation is in the reverse order of removal.
Torque brake lines to proper specification. Refer to BR-18, "Hydraulic Circuit".

CAUTION:
In the case that the ABS actuator and electronic unit (control unit) is replaced, after installation, adjust position of steering angle sensor. Refer to BRC-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

YAW RATE/SIDE/DECEL G SENSOR

Removal and Installation

INFOID:0000000007419075

CAUTION:

- **Do not drop or strike the yaw rate/side/decel G sensor, because it has little endurance to impacts.**
- **Do not use power tools, because yaw rate/side/decel G sensor is sensitive to impacts.**
- **For installation, make sure the arrow on top of the yaw rate/side/decel G sensor is pointing to the front of the vehicle.**

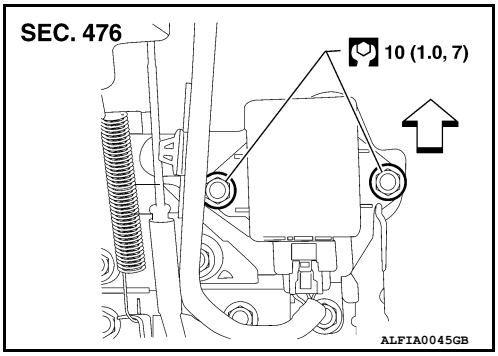
REMOVAL

1. Remove the center console. Refer to IP-23, "Disassembly and Assembly".
2. Disconnect the yaw rate/side/decel G sensor harness connector.
3. Remove the yaw rate/side/decel G sensor nuts.
4. Remove the yaw rate/side/decel G sensor.

INSTALLATION

Installation is in the reverse order of removal.

- For installation, make sure the arrow on top of the yaw rate/side/decel G sensor is pointing to the front of the vehicle.
- ⇦: Front of vehicle.



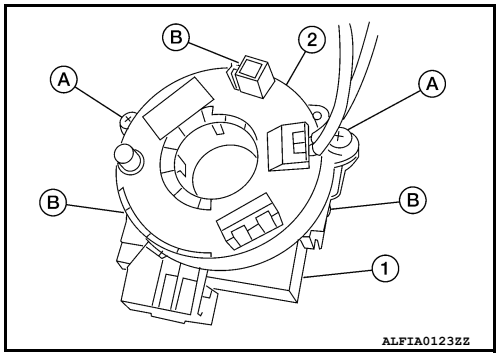
STEERING ANGLE SENSOR

Removal and Installation

INFOID:0000000007419076

REMOVAL

1. Remove the spiral cable. Refer to SR-8, "Removal and Installation".
2. Remove the two screws (A) and release the three clips (B) to remove the steering angle sensor (1) from spiral cable (2).



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Perform the neutral position adjustment for the steering angle sensor. Refer to BRC-143, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"