SECTION BRC
BRAKE CONTROL SYSTEM

CONTENTS

VDC/TCS/ABS

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

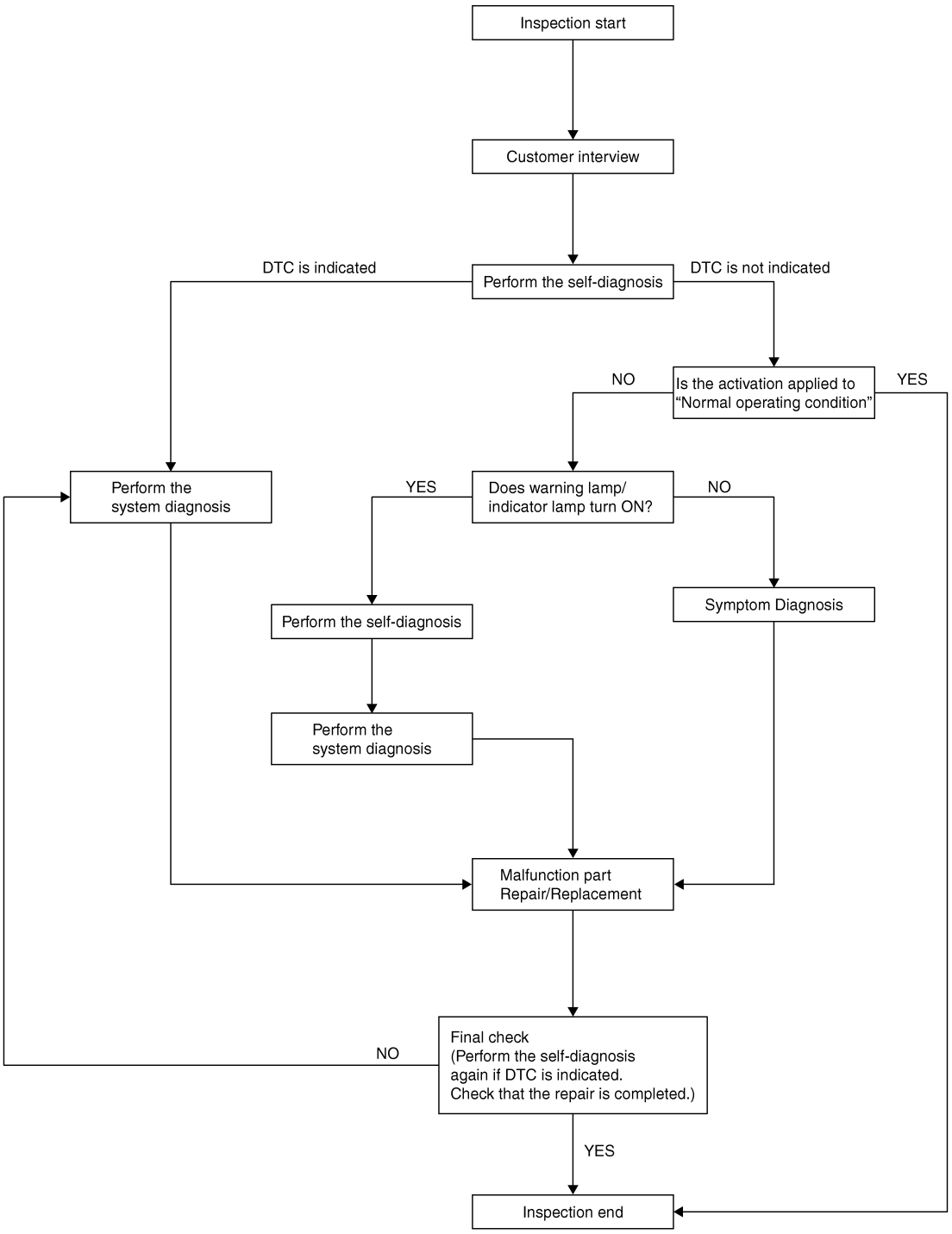
Work Flow

INFOID:0000000003895306

PRECAUTIONS FOR DIAGNOSIS

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

OVERALL SEQUENCE



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DETAILED FLOW

1. COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to BRC-7, "Diagnostic Work Sheet".

>> GO TO 2.

2.PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is there any DTC displayed?

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

3.PERFORM THE SYSTEM DIAGNOSIS

Perform the diagnosis applicable to the displayed DTC. Refer to BRC-88, "DTC No. Index".

>> GO TO 7.

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

Check that the symptom is a normal operation that is not considered a system malfunction. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is the symptom is a normal operation?

YES >> Inspection End
NO >> GO TO 5.

5.CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.

- ABS warning lamp: Refer to BRC-72, "Description".
- Brake warning lamp: Refer to BRC-73, "Description".
- VDC OFF indicator lamp: Refer to BRC-74, "Description".
- SLIP indicator lamp: Refer to BRC-75, "Description".

Is ON/OFF timing normal?

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

6.PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom.

>> GO TO 7.

7.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 8.

8.FINAL CHECK

Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, erase the self-diagnosis memory. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is no other DTC present and the repair completed?

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

Diagnostic Work Sheet

INFOID:0000000003895307

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:0000000003895308

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:0000000003895309

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:0000000003895310

When performing work that applies to the list below, make sure to adjust neutral position of steering angle sensor before operating 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:0000000003895311

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

CAUTION:

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

1.ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

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

1. On the CONSULT-III screen, touch "WORK SUPPORT", then "ST ANG SEN ADJUSTMENT".
2. Touch “START”.

CAUTION:
Do not touch steering wheel while adjusting steering angle sensor.

3. After approximately 10 seconds, touch “END”.

NOTE:
After approximately 60 seconds, the adjustment ends automatically.

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

CAUTION:
Be sure to perform above operation.

>> GO TO 3.

3. CHECK DATA MONITOR

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

Is the steering angle within the specified range?

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

4. ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to BRC-22, "CONSULT-III Function (ABS)".
- ECM: Refer to EC-123, "CONSULT-III Function".

Are the memories erased?

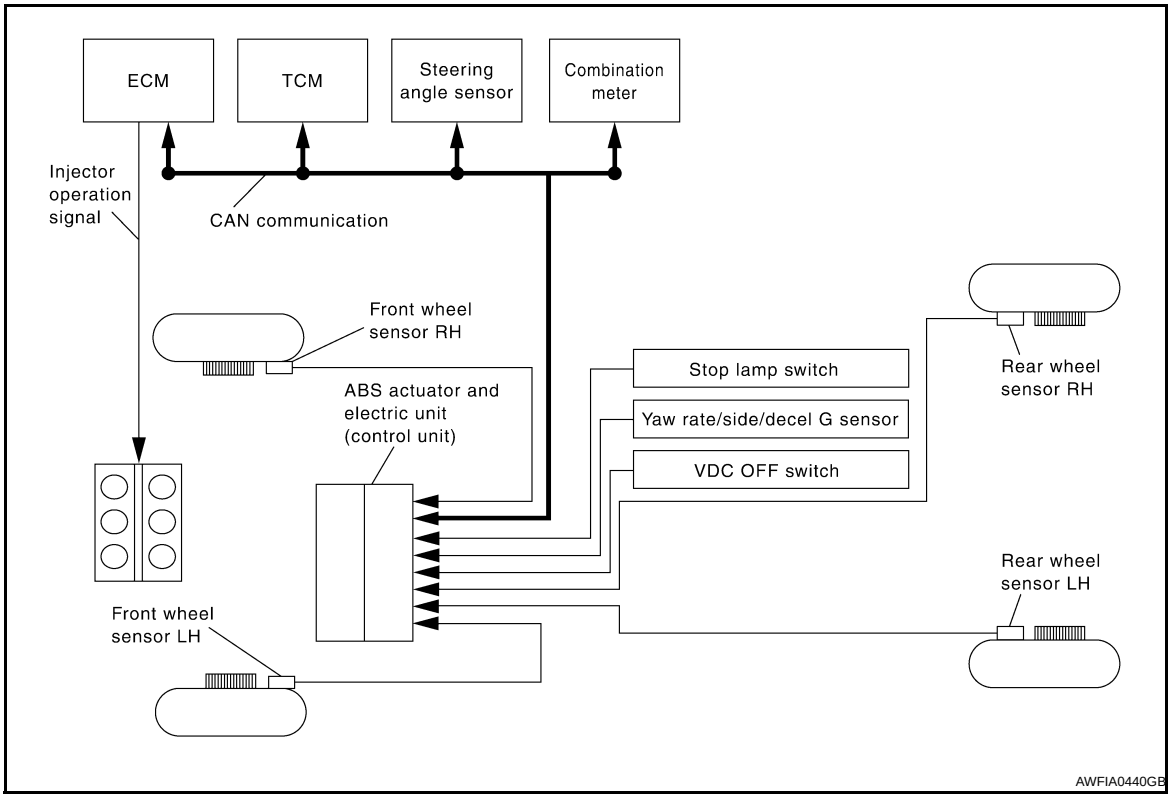
YES >> Inspection End
NO >> Check the items indicated by the self-diagnosis.

FUNCTION DIAGNOSIS

VDC

System Diagram

INFOID:0000000003895312



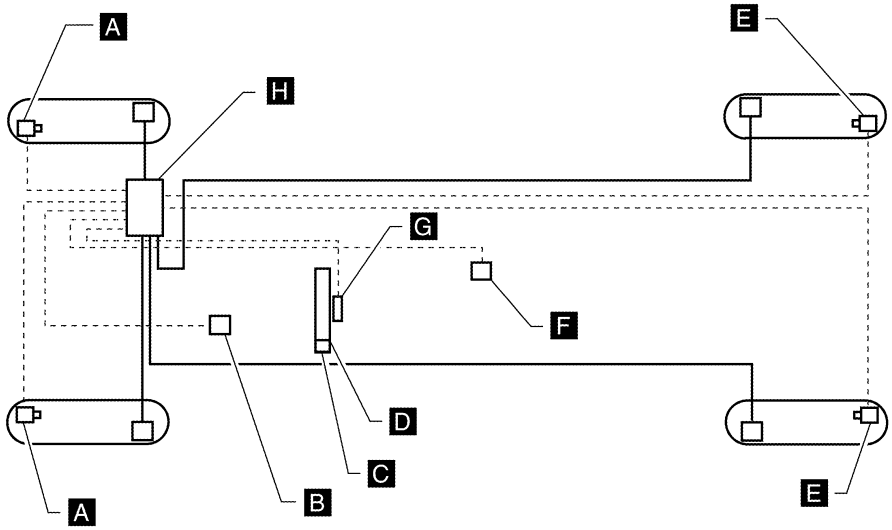
System Description

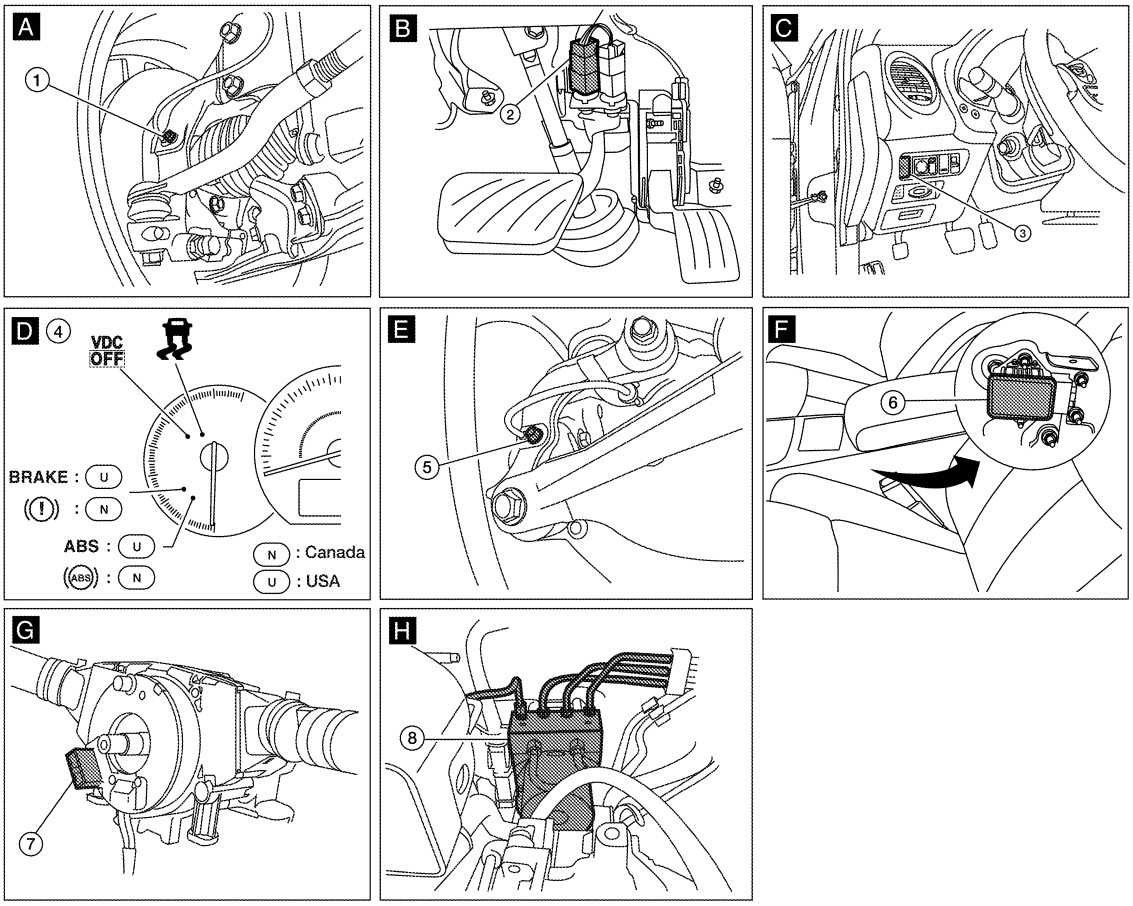
INFOID:0000000003895313

- 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-III is available.

Component Parts Location

INFOID:0000000003895314





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1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. Stop lamp switch E38
3. VDC OFF switch M72

4. Combination meter M24
5. Rear wheel sensor LH C1
   Rear wheel sensor RH C2
6. Yaw rate/side/decel G sensor M55
7. Steering angle sensor M53 (view with steering wheel removed)
8. ABS actuator and electric unit (control unit) E26

Component Description

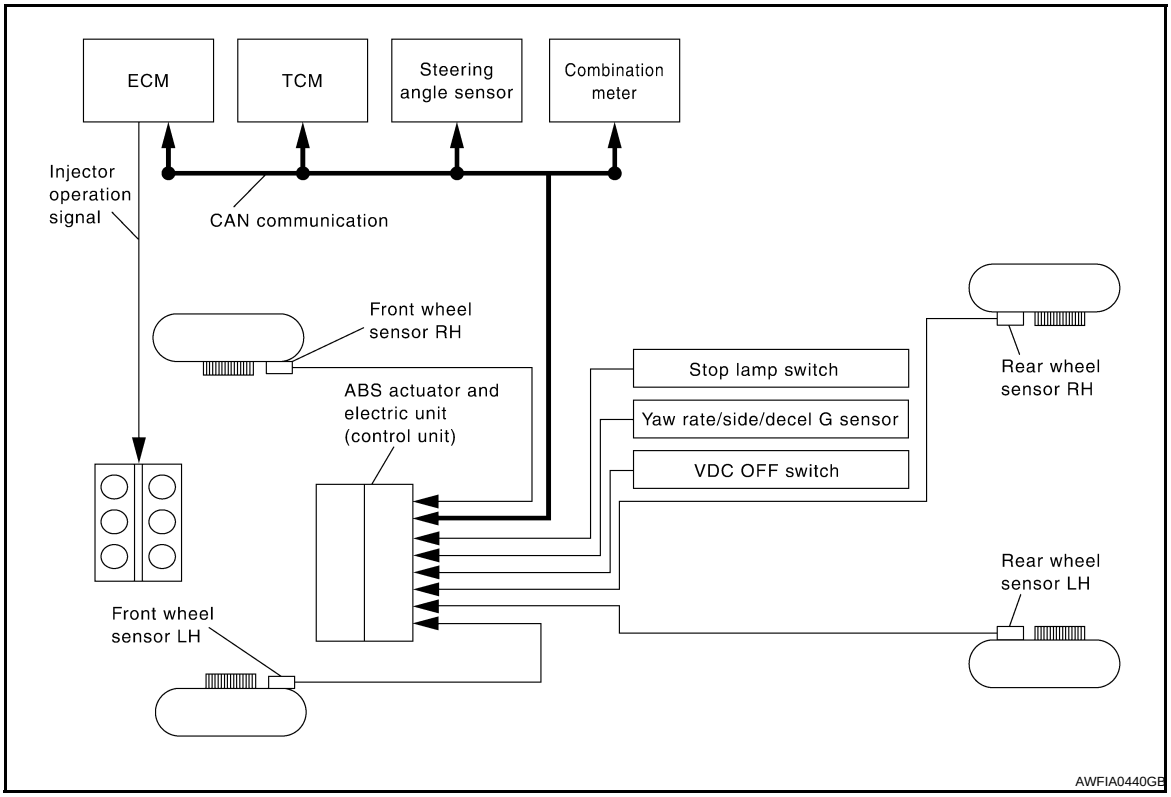
INFOID:0000000003895315

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-36, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-38, "Description"
	Solenoid valve	BRC-45, "Description"
	Pressure sensor	BRC-52, "Description"
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-59, "Description"
Wheel sensor		BRC-27, "Description"
Yaw rate/side/G sensor		BRC-56, "Description"
Steering angle sensor		BRC-54, "Description"
VDC OFF switch		BRC-70, "Description"
ABS warning lamp		BRC-72, "Description"
Brake warning lamp		BRC-73, "Description"
Stop lamp switch		BRC-43, "Description"
VDC OFF indicator lamp		BRC-74, "Description"
Slip indicator lamp		BRC-75, "Description"

TCS

System Diagram

INFOID:0000000004260324



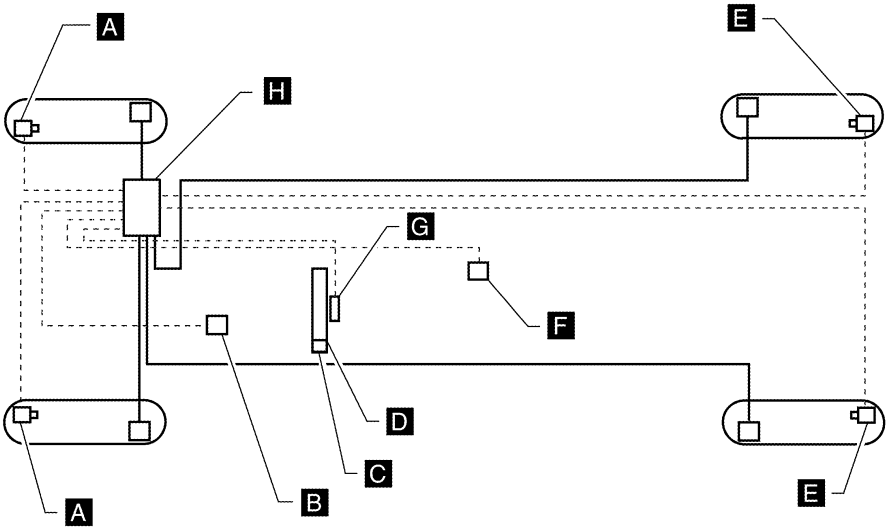
System Description

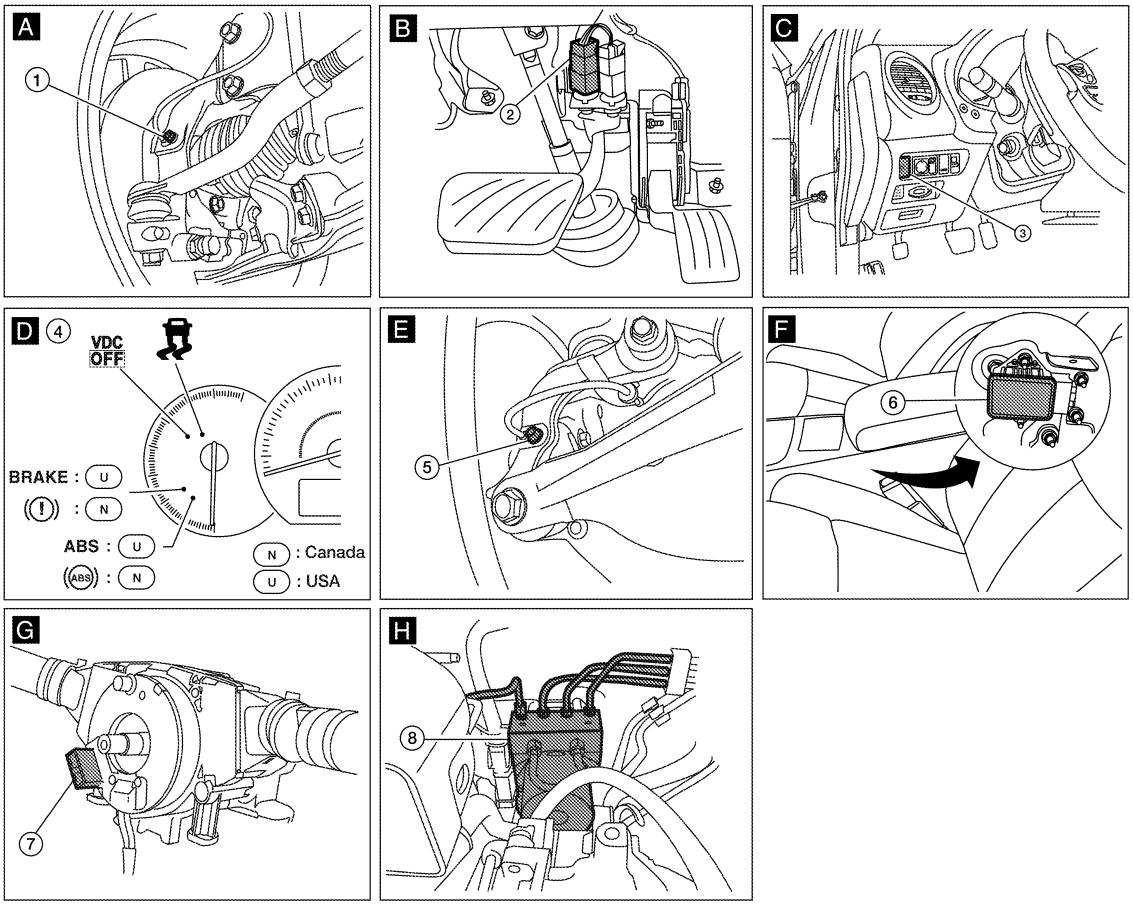
INFOID:0000000004260333

- 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-III is available.

Component Parts Location

INFOID:0000000004260327





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1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. Stop lamp switch E38
3. VDC OFF switch M72

4. Combination meter M24
5. Rear wheel sensor LH C1
   Rear wheel sensor RH C2
6. Yaw rate/side/decel G sensor M55
7. Steering angle sensor M53 (view with steering wheel removed)
8. ABS actuator and electric unit (control unit) E26

Component Description

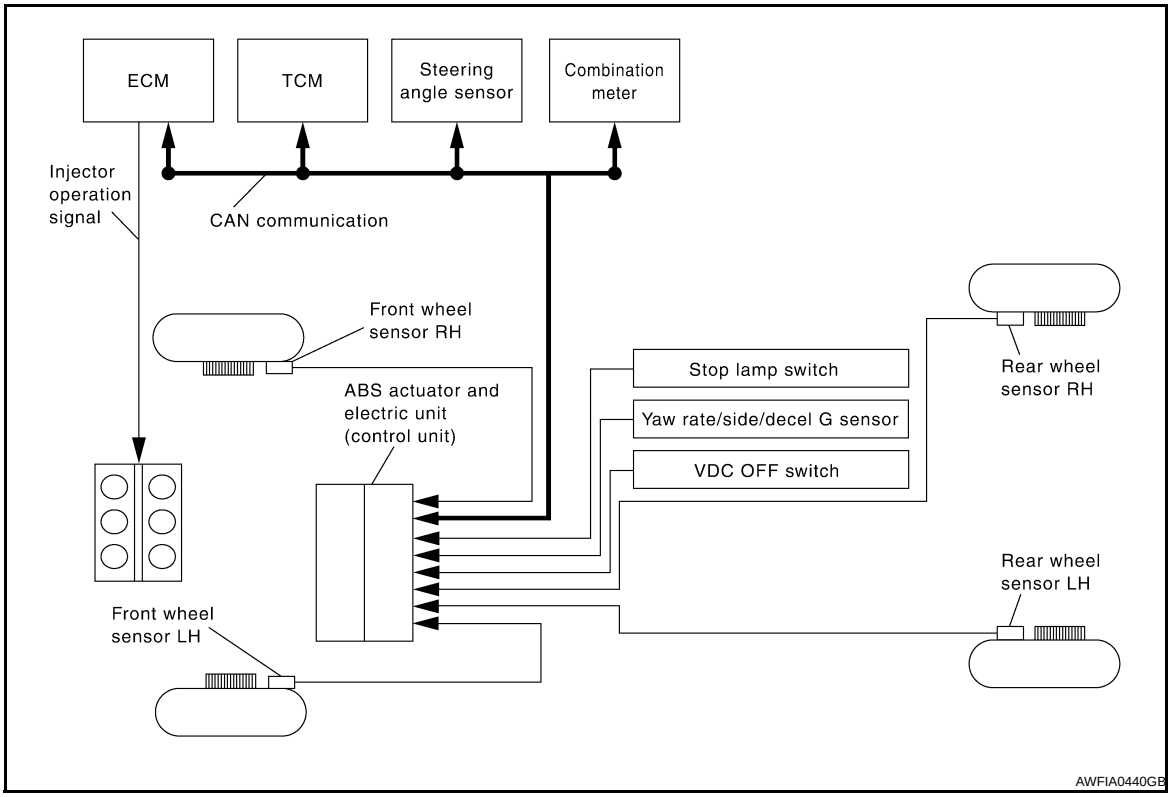
INFOID:0000000004260328

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-36, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-38, "Description"
	Solenoid valve	BRC-45, "Description"
	Pressure sensor	BRC-52, "Description"
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-59, "Description"
Wheel sensor		BRC-27, "Description"
Yaw rate/side/G sensor		BRC-56, "Description"
Steering angle sensor		BRC-54, "Description"
VDC OFF switch		BRC-70, "Description"
ABS warning lamp		BRC-72, "Description"
Brake warning lamp		BRC-73, "Description"
Stop lamp switch		BRC-43, "Description"
VDC OFF indicator lamp		BRC-74, "Description"
Slip indicator lamp		BRC-75, "Description"

ABS

System Diagram

INFOID:0000000004260325



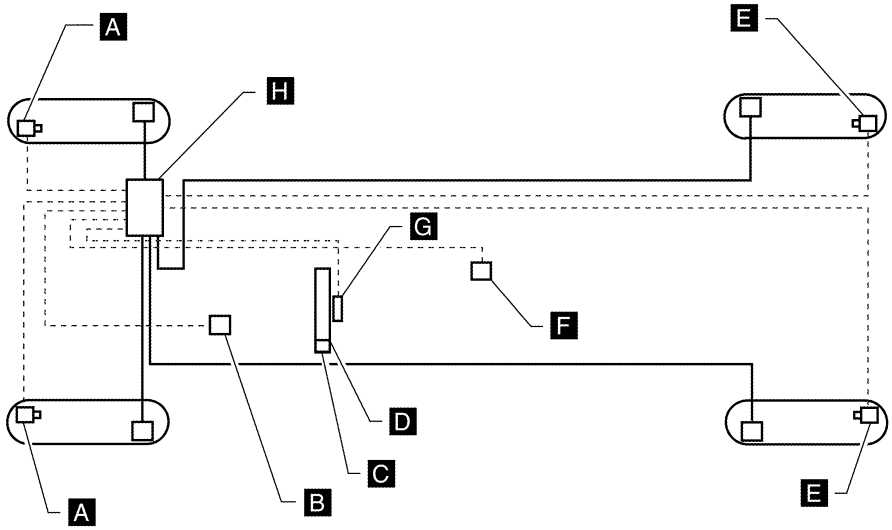
System Description

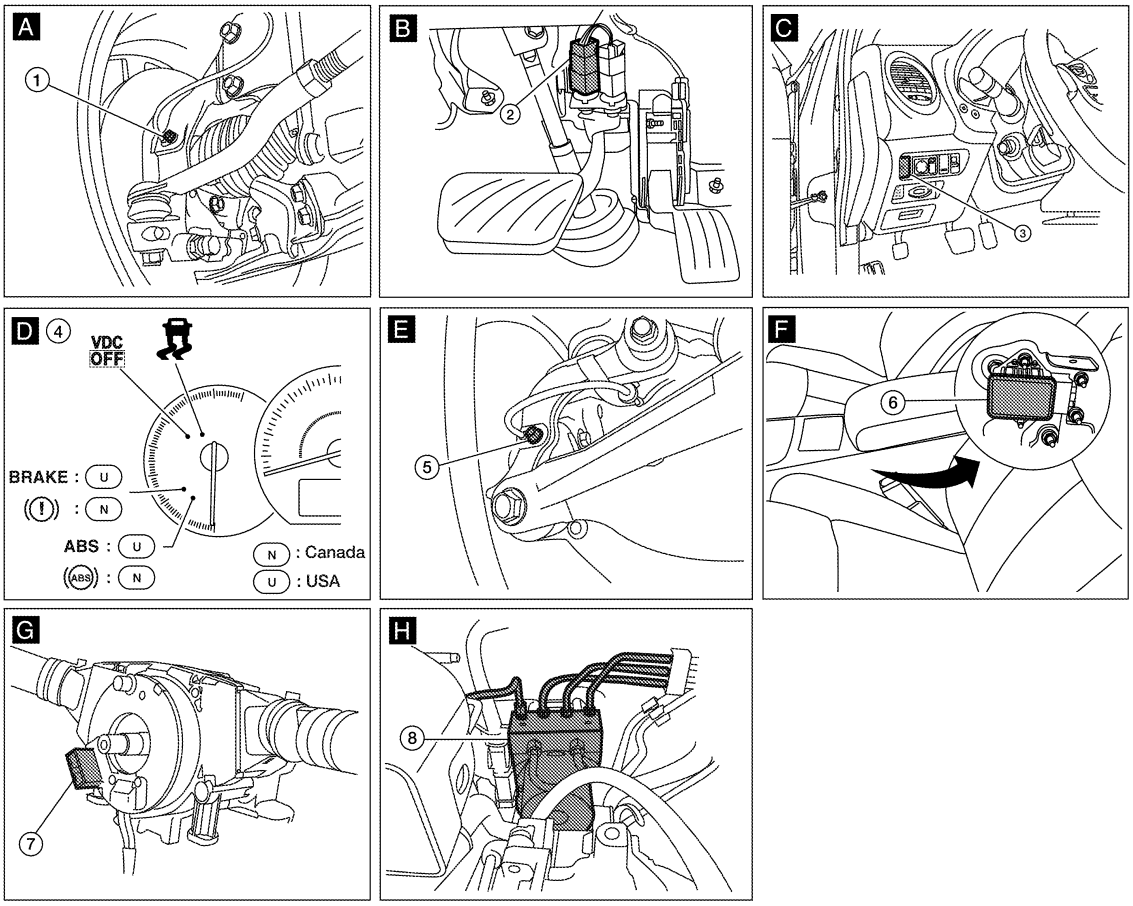
INFOID:0000000004260334

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

Component Parts Location

INFOID:0000000004260329





AWFIA0442GB

1. Front wheel sensor LH E19
   Front wheel sensor RH E41
2. Stop lamp switch E38
3. VDC OFF switch M72

4. Combination meter M24
5. Rear wheel sensor LH C1
   Rear wheel sensor RH C2
6. Yaw rate/side/decel G sensor M55
7. Steering angle sensor M53 (view with steering wheel removed)
8. ABS actuator and electric unit (control unit) E26

Component Description

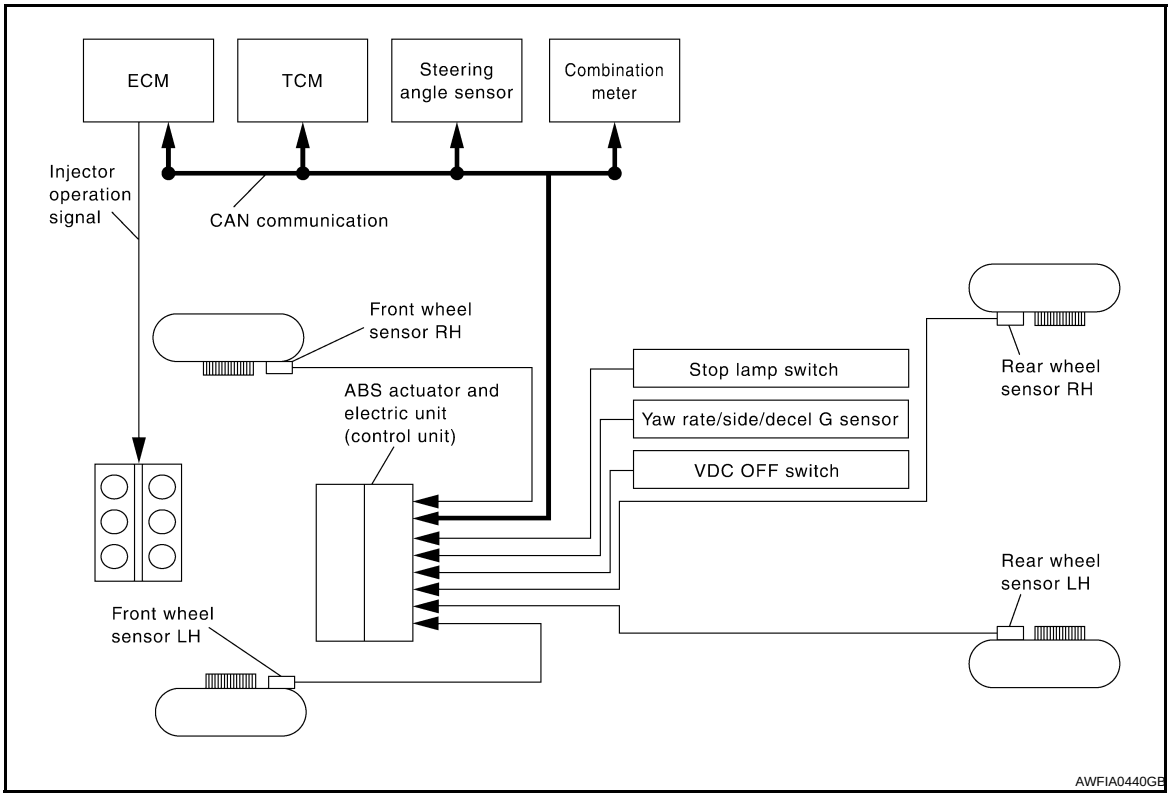
INFOID:0000000004260330

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-36, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-38, "Description"
	Solenoid valve	BRC-45, "Description"
	Pressure sensor	BRC-52, "Description"
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-59, "Description"
Wheel sensor		BRC-27, "Description"
Yaw rate/side/G sensor		BRC-56, "Description"
Steering angle sensor		BRC-54, "Description"
VDC OFF switch		BRC-70, "Description"
ABS warning lamp		BRC-72, "Description"
Brake warning lamp		BRC-73, "Description"
Stop lamp switch		BRC-43, "Description"
VDC OFF indicator lamp		BRC-74, "Description"
Slip indicator lamp		BRC-75, "Description"

EBD

System Diagram

INFOID:0000000004260326



System Description

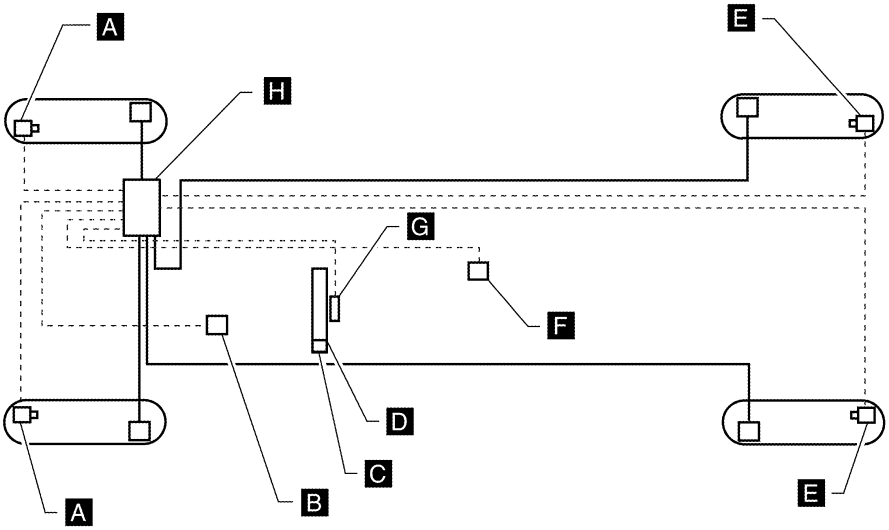
INFOID:0000000004260335

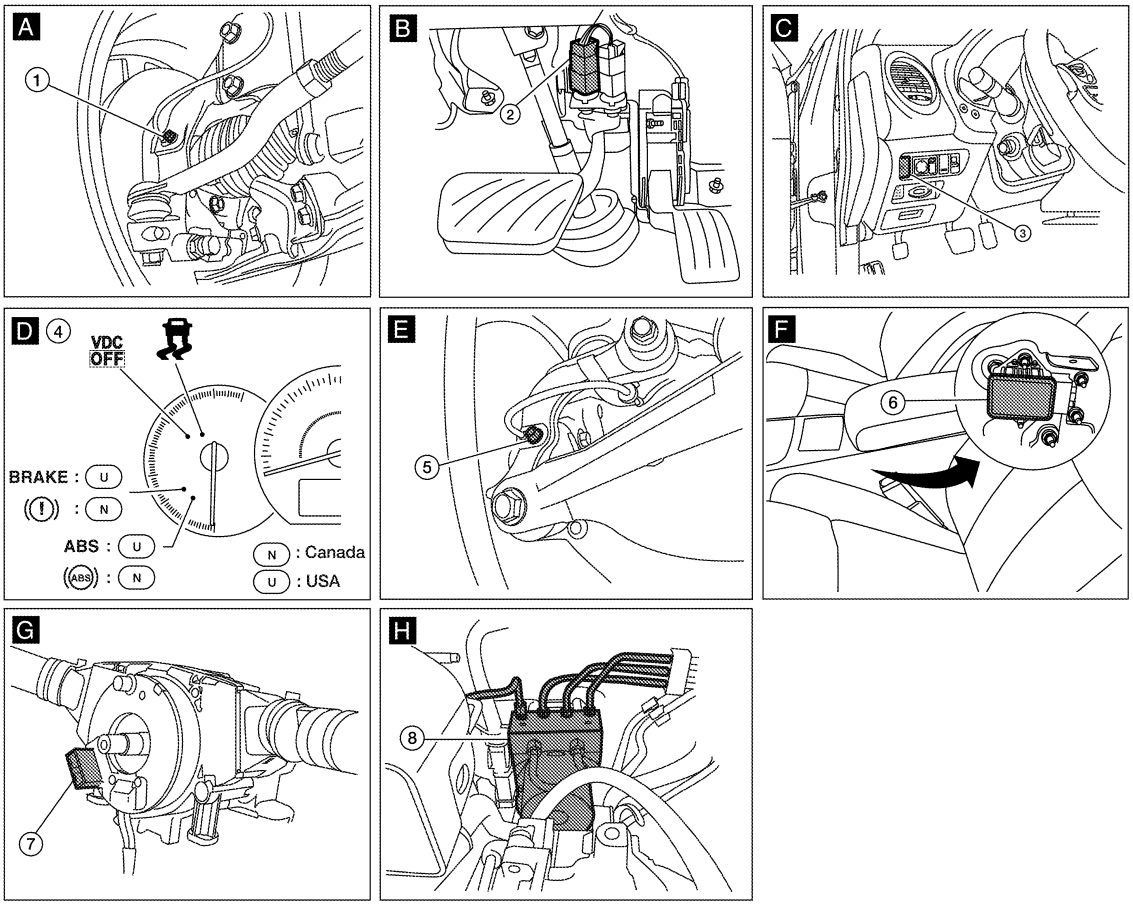
Electric Brake force Distribution functions as follows:

- 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-III is available.

Component Parts Location

INFOID:0000000004260331





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1. Front wheel sensor LH E19
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2. Stop lamp switch E38
3. VDC OFF switch M72

4. Combination meter M24
5. Rear wheel sensor LH C1
Rear wheel sensor RH C2
6. Yaw rate/side/decel G sensor M55
7. Steering angle sensor M53 (view with steering wheel removed)
8. ABS actuator and electric unit (control unit) E26

Component Description

INFOID:0000000004260332

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-36, "Description"
	Motor	
	Actuator relay (Main relay)	BRC-38, "Description"
	Solenoid valve	BRC-45, "Description"
	Pressure sensor	BRC-52, "Description"
	VDC switch-over valve (HSV1, HSV2, USV1, USV2)	BRC-59, "Description"
Wheel sensor		BRC-27, "Description"
Yaw rate/side/G sensor		BRC-56, "Description"
Steering angle sensor		BRC-54, "Description"
VDC OFF switch		BRC-70, "Description"
ABS warning lamp		BRC-72, "Description"
Brake warning lamp		BRC-73, "Description"
Stop lamp switch		BRC-43, "Description"
VDC OFF indicator lamp		BRC-74, "Description"
Slip indicator lamp		BRC-75, "Description"

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

CONSULT-III Function (ABS)

INFOID:0000000004225392

FUNCTION

CONSULT-III 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.
Self-diagnostic result	Displays ABS actuator and electric unit (control unit) self-diagnosis results.
CAN diag support monitor	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 RESULTS 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, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
- Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- VDC OFF switch should not stay in “ON” position.

Display Item List

Refer to BRC-88, "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.

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	×	×	×	This item is not used for this model.
SLCT LVR POSI (N/P, R, N/P, D)	×	×	×	Selector lever position judged by PNP switch signal.
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 (deg)	×	—	×	Steering angle detected by steering angle sensor is displayed.
PRESS SENSOR (bar)	×	—	×	Brake fluid pressure detected by pressure sensor is displayed.
ENGINE RPM (rpm)	×	—	×	Engine speed judged by CAN communication signal is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor is displayed.
FLUID LEV SW (ON/OFF)	×	—	×	Brake fluid level switch (ON/OFF) status is displayed.
PARK BRAKE SW (ON/OFF)	×	—	×	Parking brake switch (ON/OFF) status is displayed.
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.
EBD WARN LAMP (ON/OFF)	—	—	×	EBD warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	—	×	×	VDC OFF lamp (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	—	×	×	SLIP indicator lamp (ON/OFF) status is displayed.
EBD SIGNAL (ON/OFF)	—	—	×	EBD operation (ON/OFF) status is displayed.

ABS SIGNAL (ON/OFF)	—	—	×	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	—	—	×	TCS operation (ON/OFF) status is displayed.
VDC SIGNAL (ON/OFF)	—	—	×	VDC operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	—	—	×	EBD fail signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	—	—	×	ABS fail signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	—	—	×	TCS fail signal (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	—	—	×	VDC fail signal (ON/OFF) status is displayed.
CRANKING SIG (ON/OFF)	—	—	×	Cranking condition (ON/OFF) status is displayed.
USV [FL-RR] (ON/OFF)	—	—	×	Primary side USV solenoid valve (ON/OFF) status is displayed.
USV [FR-RL] (ON/OFF)	—	—	×	Secondary side USV solenoid valve (ON/OFF) status is displayed.
HSV [FL-RR] (ON/OFF)	—	—	×	Primary side HSV solenoid valve (ON/OFF) status is displayed.
HSV [FR-RL] (ON/OFF)	—	—	×	Secondary side HSV solenoid valve (ON/OFF) status is displayed.
V/R OUTPUT (ON/OFF)	—	—	×	Valve relay operation signal (ON/OFF) status is displayed.
M/R OUTPUT (ON/OFF)	—	—	×	Motor relay operation signal (ON/OFF) status is displayed.

×: Applicable

–: Not applicable

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-RR]	Off	Off	On*	—	—	—
	USV [FR-RL]	Off	Off	On*	—	—	—
	HSV [FL-RR]	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 [FR-RR]	Off	Off	On*	—	—	—
	USV [FR-RL]	Off	Off	On*	—	—	—
	HSV [FL-RR]	Off	Off	On*	—	—	—
	HSV [FR-RL]	Off	Off	On*	—	—	—
RR RH SOL	RR RH IN SOL	Off	On	On	—	—	—
	RR RH OUT SOL	Off	Off	On*	—	—	—
	USV [FR-RR]	Off	Off	On*	—	—	—
	USV [FR-RL]	Off	Off	On*	—	—	—
	HSV [FL-RR]	Off	Off	On*	—	—	—
	HSV [FR-RL]	Off	Off	On*	—	—	—
RR LH SOL	RR LH IN SOL	Off	On	On	—	—	—
	RR LH OUT SOL	Off	Off	On*	—	—	—
	USV [FR-RR]	Off	Off	On*	—	—	—
	USV [FR-RL]	Off	Off	On*	—	—	—
	HSV [FL-RR]	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-RR]	—	—	—	Off	Off	Off
	USV [FR-RL]	—	—	—	Off	On	On
	HSV [FL-RR]	—	—	—	Off	Off	Off
	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 [FR-RR]	—	—	—	Off	Off	Off
	USV [FR-RL]	—	—	—	Off	On	On
	HSV [FL-RR]	—	—	—	Off	Off	Off
	HSV [FR-RL]	—	—	—	Off	On*	Off
RR RH ABS SOLENOID (ACT)	RR RH IN SOL	—	—	—	Off	Off	Off
	RR RH OUT SOL	—	—	—	Off	Off	Off
	USV [FR-RR]	—	—	—	Off	Off	Off
	USV [FR-RL]	—	—	—	Off	On	On
	HSV [FL-RR]	—	—	—	Off	Off	Off
	HSV [FR-RL]	—	—	—	Off	On*	Off

Operation		ABS solenoid valve			ABS solenoid valve (ACT)		
		Up	Keep	Down	Up	ACT UP	ACT KEEP
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	—	—	—	Off	Off	Off
	RR LH OUT SOL	—	—	—	Off	Off	Off
	USV [FR-RR]	—	—	—	Off	Off	Off
	USV [FR-RL]	—	—	—	Off	On	On
	HSV [FL-RR]	—	—	—	Off	Off	Off
	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, actuator relay, V/R output and M/R output operate as shown in table below.

Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On
V/R OUTPUT	On	On
M/R OUTPUT	On	Off

COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:0000000003895317

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:0000000003895318

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

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

Diagnosis Procedure

INFOID:0000000003895319

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 the wheel sensor. Refer to BRC-100, "Removal and Installation".

3.CHECK TIRES

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

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

YES >> GO TO 4
NO >> Adjust tire pressure, or replace tire(s).

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to FAX-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

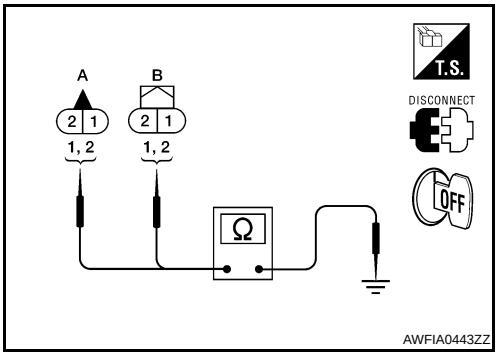
Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-9, "Wheel Bearing (Rear)" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check continuity between front wheel sensor connector terminals (A), rear wheel sensor connector terminals (B) and ground.

: Continuity should not exist.



Is the inspection result normal?

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

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector E19, E41, C1 or C2.

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	C1	1	
		17		2	
Rear RH		8	C2	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000003895320

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-27, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003895330

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

INFOID:0000000004244434

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:0000000003895322

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	• Harness or connector • Wheel sensor • ABS actuator and electric unit (control unit)
C1106	RR LH SENSOR-2	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1107	FR RH SENSOR-2	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1108	FR LH SENSOR-2	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-30, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000004244436

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 the wheel sensor. Refer to BRC-100, "Removal and Installation".

3.CHECK TIRES

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

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

YES >> GO TO 4
NO >> Adjust tire pressure, or replace tire(s).

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to FAX-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

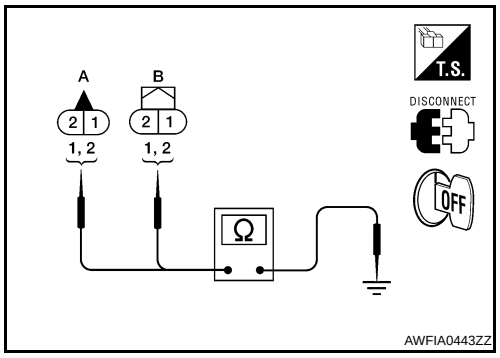
Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-9, "Wheel Bearing (Rear)" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check continuity between front wheel sensor connector terminals (A), rear wheel sensor connector terminals (B) and ground.

: Continuity should not exist.



Is the inspection result normal?

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

6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector E19, E41, C1 or C2.

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	C1	1	
		17		2	
Rear RH		8	C2	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000004244438

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-30, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000004244439

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1109 BATTERY VOLTAGE [ABNORMAL]

Description

INFOID:0000000003895325

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

DTC Logic

INFOID:0000000003895326

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-33, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003895327

1.CONNECTOR INSPECTION

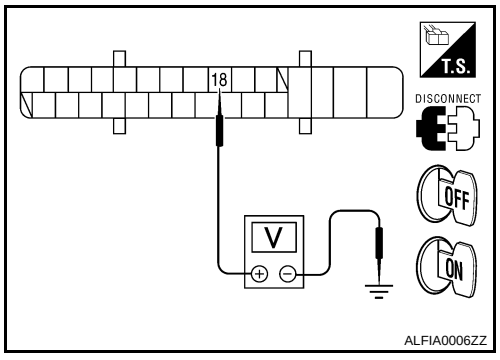
1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is any item displayed on the self-diagnosis display?

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

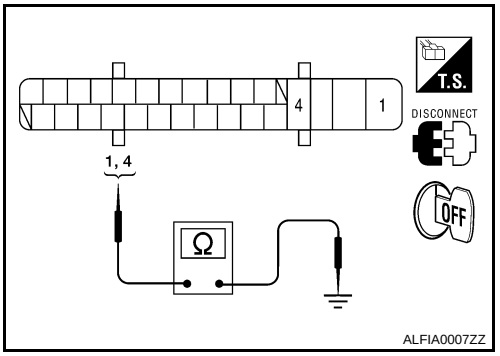
1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check voltage between ABS actuator and electric unit (control unit) connector E26 terminal 18 and ground.



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

4. Turn ignition switch OFF.
5. 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.

Special Repair Requirement

INFOID:0000000004244441

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

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

DTC Logic

INFOID:0000000003895328

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	• ABS actuator and electric unit (control unit)
C1153	EMERGENCY BRAKE	When ABS actuator and electric unit (control unit) is malfunctioning. (Pressure increase is too much or too little)	
C1170	VARIANT CODING	In a case where VARIANT CODING is different.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE
EMERGENCY BRAKE
VARIANT CODING

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-35, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003895329

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

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

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

Special Repair Requirement

INFOID:0000000004244442

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1111 PUMP MOTOR

Description

INFOID:0000000003895331

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:0000000003895332

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1111	PUMP MOTOR	During actuator motor 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 actuator motor OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is above displayed on the self-diagnosis display?

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

Diagnosis Procedure

INFOID:0000000003895333

1.CONNECTOR INSPECTION

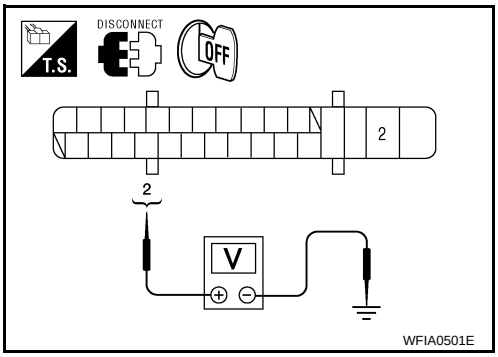
1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

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 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

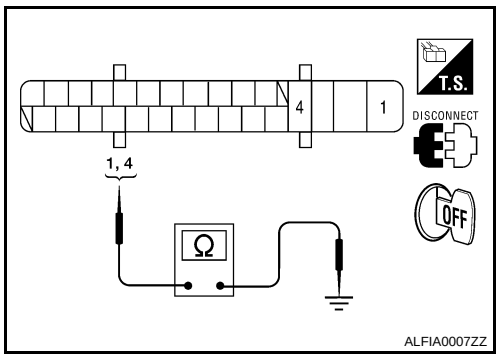
Is the inspection result normal?

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-103, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000003895334

1. CHECK ACTIVE TEST

1. On “ACTIVE TEST”, select “ABS MOTOR”.
2. Touch “On” and “Off” on screen. Make sure motor relay, actuator relay, V/R output and M/R output operate as shown in table below.

Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On
V/R OUTPUT	On	On
M/R OUTPUT	On	Off

Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000004244443

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1114 MAIN RELAY

Description

INFOID:0000000003895335

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

DTC Logic

INFOID:0000000003895336

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1114	MAIN RELAY	During actuator relay 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 actuator relay ON, when the actuator relay turns ON, or when the control line for the relay is open.	

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
MAIN RELAY

Is above displayed on the self-diagnosis display?

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

Diagnosis Procedure

INFOID:0000000003895337

1.CONNECTOR INSPECTION

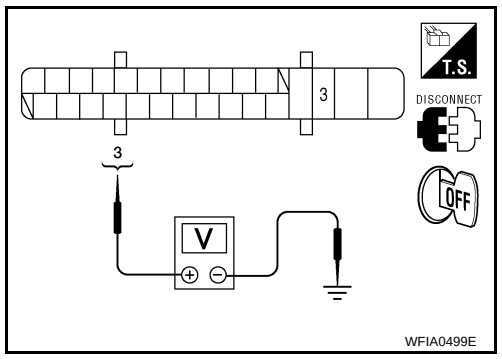
1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connector and perform self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

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.



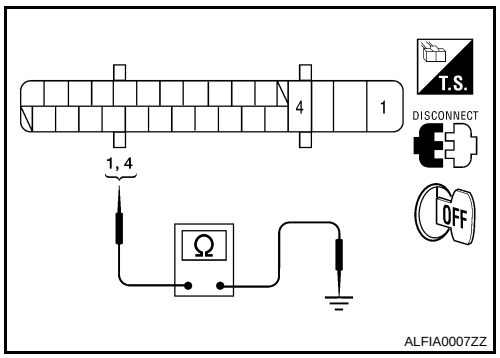
ABS actuator and electric unit (control unit)		Ground	Voltage (Approx.)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY 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-103, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000004244476

1.CHECK ACTIVE TEST

1. On “ACTIVE TEST”, select “ABS MOTOR”.
2. Touch “On” and “Off” on screen. Make sure motor relay, actuator relay, V/R output and M/R output operate as shown in table below.

Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On
V/R OUTPUT	On	On
M/R OUTPUT	On	Off

Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000004244444

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1115 ABS SENSOR [ABNORMAL SIGNAL]

Description

INFOID:0000000004244435

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:0000000003895340

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ABS SENSOR [ABNORMAL SIGNAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-40, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000004244437

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 the wheel sensor. Refer to BRC-100, "Removal and Installation".

3.CHECK TIRES

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

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

YES >> GO TO 4
NO >> Adjust tire pressure, or replace tire(s).

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to FAX-6, "Inspection" (front) or RAX-6, "On-vehicle Service" (rear).

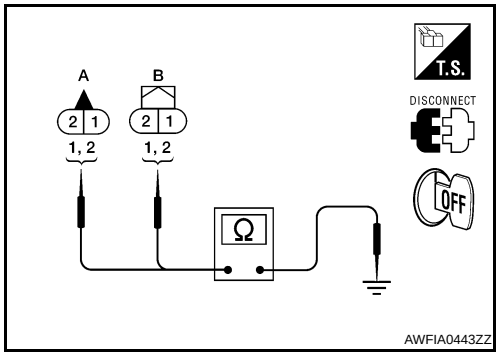
Is the inspection result normal?

YES >> GO TO 5
NO >> Repair or replace as necessary. Refer to FAX-8, "Removal and Installation" (front) or RAX-9, "Wheel Bearing (Rear)" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor of malfunctioning code.
2. Check continuity between front wheel sensor connector terminals (A), rear wheel sensor connector terminals (B) and ground.

: Continuity should not exist.



Is the inspection result normal?

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

6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector E19, E41, C1 or C2.

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	C1	1	
		17		2	
Rear RH		8	C2	1	
		19		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> Repair the circuit.

Component Inspection

INFOID:0000000003895342

COMPONENT INSPECTION

1. CHECK DATA MONITOR

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

Wheel sensor	Vehicle speed (DATA MONITOR)

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

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to BRC-40, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000004244440

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1116 STOP LAMP SW

Description

INFOID:0000000003895343

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

DTC Logic

INFOID:0000000003895344

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
STOP LAMP SWITCH

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-43, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003895345

1.CONNECTOR INSPECTION

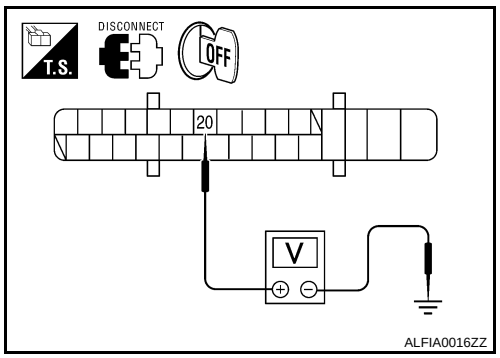
1. Disconnect stop lamp switch connector and ABS actuator and electric unit (control unit) connector.
2. Check terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

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

2.CHECK STOP LAMP SWITCH CIRCUIT

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



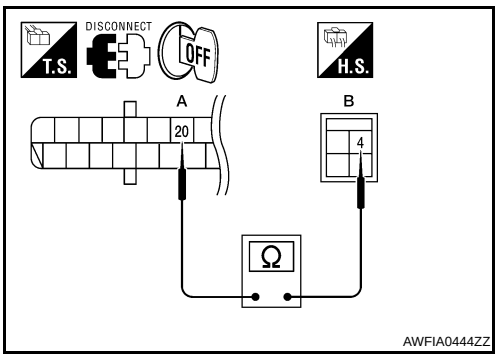
ABS actuator and electric unit (control unit)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E26	20	—	Brake pedal depressed	Battery voltage
			Brake pedal released	0V

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> GO TO 3

3.CHECK STOP LAMP SWITCH CIRCUIT FOR OPEN

1. Disconnect stop lamp switch connector.
2. Check continuity between ABS actuator and electric unit (control unit) connector E26 (A) terminal 20 and stop lamp switch connector E38 (B) terminal 4.



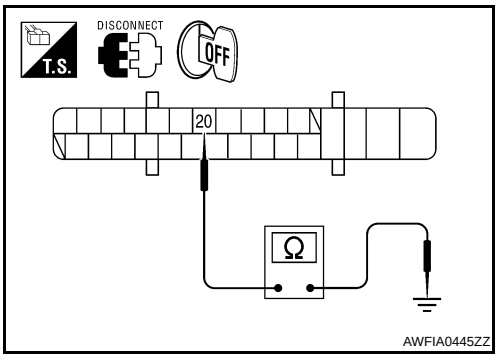
ABS actuator and electric unit (control unit)		stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
E26 (A)	20	E38 (B)	4	Yes

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace as necessary.

4.CHECK STOP LAMP SWITCH CIRCUIT FOR SHORT

Check continuity between ABS actuator and electric unit (control unit) connector E26 terminal 20 and ground.



ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26	20	—	No

Is the inspection result normal?

YES >> Replace stop lamp switch.
NO >> Repair harness or connectors.

Special Repair Requirement

INFOID:0000000004244445

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1120, C1122, C1124, C1126 IN ABS SOL

Description

INFOID:0000000003895347

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:0000000003895348

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-45, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000003895349

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-22, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

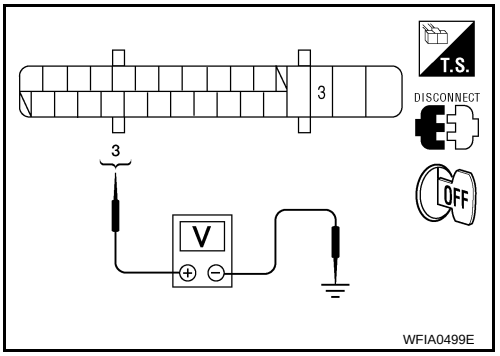
YES >> GO TO 2
NO >> Poor connection of connector terminals. Repair or replace connector.

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



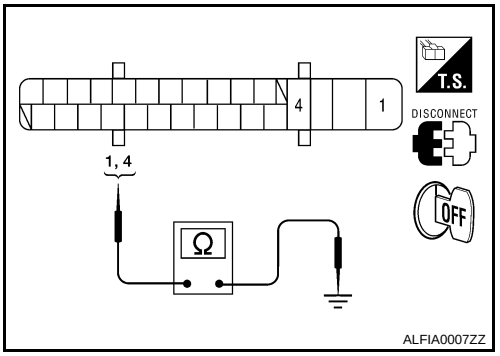
Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY 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-103, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000003895350

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-RR]	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FL-RR]	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 [FR-RR]	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*

Operation		ABS solenoid valve		
		Up	Keep	Down
RR RH SOL	RR RH IN SOL	Off	On	On
	RR RH OUT SOL	Off	Off	On*
	USV [FR-RR]	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
	RR LH OUT SOL	Off	Off	On*
	USV [FR-RR]	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FL-RR]	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-45, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000004244446

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

INFOID:0000000003895351

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:0000000003895352

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-48, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000004292751

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-22, "CONSULT-III Function (ABS)".

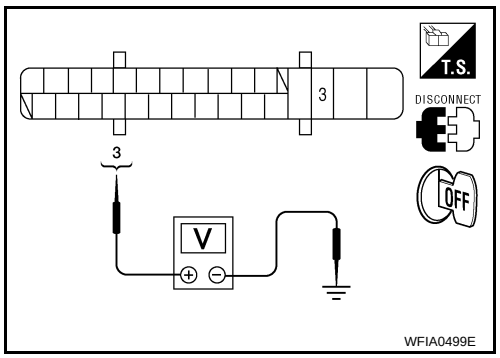
Is any item indicated on the self-diagnosis display?

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.



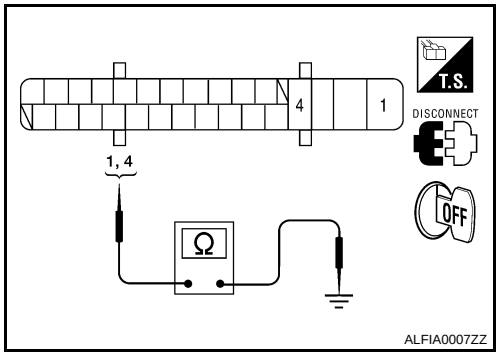
ABS actuator and electric unit (control unit)		Ground	Voltage (Approx.)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY 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-103, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000004292752

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-RR]	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FL-RR]	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 [FR-RR]	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*

Operation		ABS solenoid valve		
		Up	Keep	Down
RR RH SOL	RR RH IN SOL	Off	On	On
	RR RH OUT SOL	Off	Off	On*
	USV [FR-RR]	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FL-RR]	Off	Off	On*
	HSV [FR-RL]	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
	RR LH OUT SOL	Off	Off	On*
	USV [FR-RR]	Off	Off	On*
	USV [FR-RL]	Off	Off	On*
	HSV [FL-RR]	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-48, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000004244447

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description

INFOID:0000000003895355

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

DTC Logic

INFOID:0000000003895356

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-51, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003895357

INSPECTION PROCEDURE

1.CHECK ENGINE SYSTEM

1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to EC-123, "CONSULT-III Function".
2. Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

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

Special Repair Requirement

INFOID:0000000004244448

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1142 PRESS SEN CIRCUIT

Description

INFOID:0000000003895359

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:0000000003895360

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-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PRESS SEN CIRCUIT

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-52, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003895361

1.CONNECTOR INSPECTION

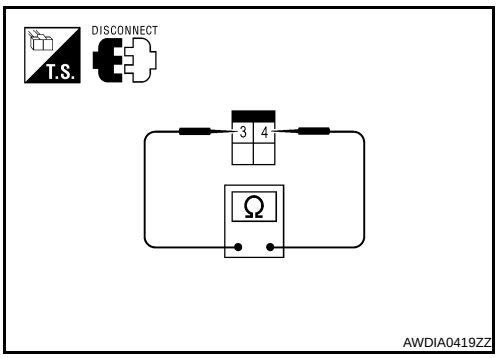
1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector and stop lamp switch connector.
3. Check terminals for deformation, disconnection, looseness and damage. If any malfunction is found, repair or replace terminals.
4. Reconnect connectors securely.
5. Start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

Is the inspection result normal?

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

2.CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch connector.
3. Check continuity between stop lamp switch terminals 3 and 4.



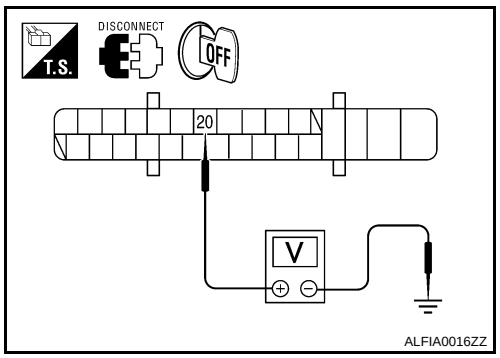
Stop lamp switch terminals	Condition	Continuity
3 – 4	Brake pedal depressed	Yes
	Brake pedal released	No

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)		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E26	20	—	Brake pedal depressed	Battery voltage
			Brake pedal released	0V

Is the inspection result normal?

YES >> GO TO 4
NO >> Repair or replace malfunctioning components.

4. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
PRESS SEN CIRCUIT

Is above displayed on the self-diagnosis display?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> Inspection End.

Component Inspection

INFOID:0000000003895362

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-52, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000004244449

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1143, C1144 STEERING ANGLE SENSOR

Description

INFOID:0000000003895364

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:0000000003895365

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-54, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003895366

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-22, "CONSULT-III Function (ABS)".

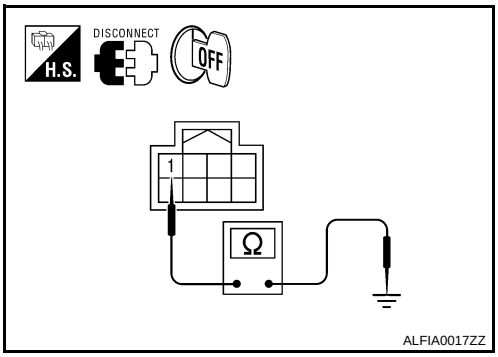
Is any item displayed on the self-diagnosis display?

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

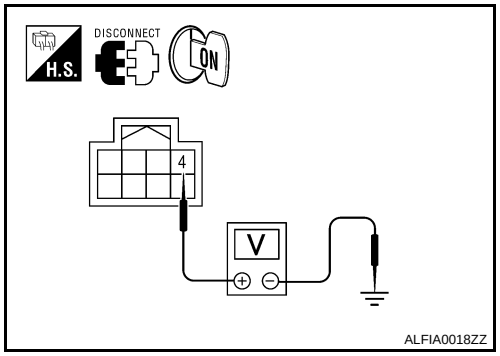
2.CHECK STEERING ANGLE SENSOR HARNESS

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 harness 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.

3. CHECK DATA MONITOR

1. Turn ignition switch OFF.
2. Connect steering angle sensor connector and ABS actuator and electric unit (control unit) connector.
3. Select “STR ANGLE SIG” in “Data Monitor” and check steering angle sensor signal.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to BRC-106, "Removal and Installation" and BRC-55, "Special Repair Requirement".

Component Inspection

INFOID:0000000003895367

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-54, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000004244450

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1145, C1146 YAW RATE/SIDE G SENSOR

Description

INFOID:0000000003895369

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:0000000003895370

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

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

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-56, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003895371

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 surfaces, VDC OFF indicator lamp may illuminate and CONSULT-III self-diagnosis may indicate yaw rate sensor system malfunction. However, in this case there is no malfunction in yaw rate sensor system. Take vehicle off of turn-table or other moving surfaces, and start engine. Results will return to normal. Also, after doing spin turns or acceleration turns with VDC function off (VDC OFF switch “ON”), the results will return to a normal condition by re-starting vehicle.**

1.CONNECTOR INSPECTION

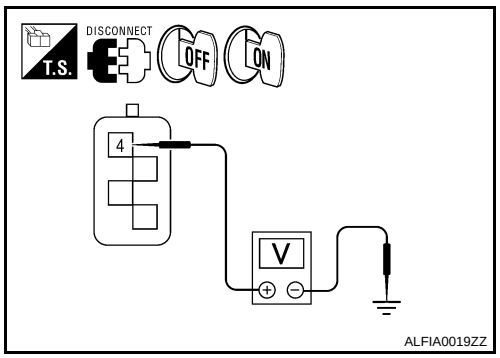
1. Turn ignition switch OFF.
2. Disconnect yaw rate/side/decel G sensor connector and ABS actuator and electric unit (control unit) connector.
3. Check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
4. Reconnect connectors and perform self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is any item displayed on the self-diagnosis display?

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

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

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



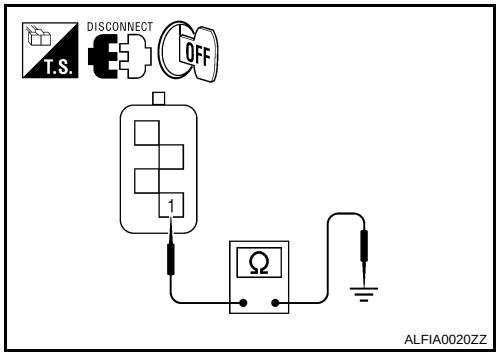
Yaw rate/side/decel G sensor		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
M55	4	—	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	0V

Is the inspection result normal?

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

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

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



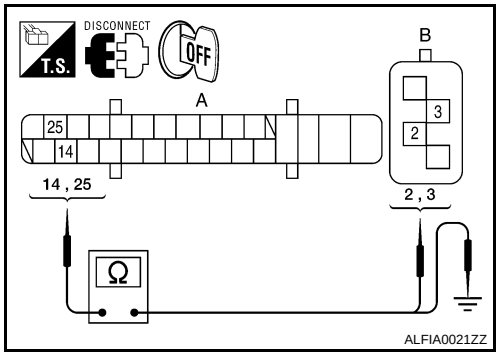
Yaw rate/side/decel G sensor		Ground	Continuity
Connector	Terminal		
M55	1	—	Yes

Is the inspection result normal?

YES >> GO TO 4
NO >> Repair or replace malfunctioning components.

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

1. Check continuity between ABS actuator and electric unit (control unit) connector E26 (A) terminals 14 and 25 and yaw rate/side/decel G sensor harness connector M55 (B) terminals 2 and 3.



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

2. Check continuity between ABS actuator and electric unit (control unit) connector E26 (A) terminals 14, 25 and ground.

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

Is the inspection result normal?

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

5. CHECK DATA MONITOR

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

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".

NO >> Replace Yaw rate/side/decel G sensor. Refer to BRC-105, "Removal and Installation".

Component Inspection

INFOID:0000000003895372

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-56, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000004244451

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1147, C1148, C1149, C1150 USV/HSV LINE

Description

INFOID:0000000003895374

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:0000000003895375

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
USV LINE[FL-RR]
USV LINE[FR-RL]
HSV LINE[FL-RR]
HSV LINE[FR-RL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-59, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000004252828

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-22, "CONSULT-III Function (ABS)".

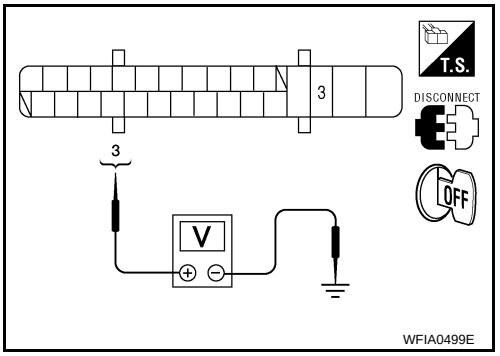
Is any item indicated on the self-diagnosis display?

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.



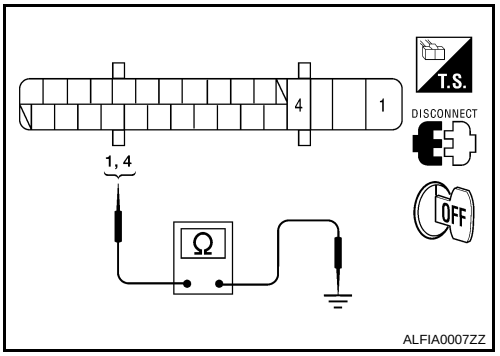
ABS actuator and electric unit (control unit)		Ground	Voltage (Approx.)
Connector	Terminal		
E26	3	—	Battery voltage

Is the inspection result normal?

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

3. CHECK SOLENOID AND ACTUATOR RELAY 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-103, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000003895377

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-RR]	Off	Off	Off
	USV [FR-RL]	Off	On	On
	HSV [FL-RR]	Off	Off	Off
	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 [FR-RR]	Off	Off	Off
	USV [FR-RL]	Off	On	On
	HSV [FL-RR]	Off	Off	Off
	HSV [FR-RL]	Off	On*	Off

Operation		ABS solenoid valve (ACT)		
		Up	ACT UP	ACT KEEP
RR RH ABS SOLENOID (ACT)	RR RH IN SOL	Off	Off	Off
	RR RH OUT SOL	Off	Off	Off
	USV [FR-RR]	Off	Off	Off
	USV [FR-RL]	Off	On	On
	HSV [FL-RR]	Off	Off	Off
	HSV [FR-RL]	Off	On*	Off
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	Off	Off	Off
	RR LH OUT SOL	Off	Off	Off
	USV [FR-RR]	Off	Off	Off
	USV [FR-RL]	Off	On	On
	HSV [FL-RR]	Off	Off	Off
	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-59, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000004244452

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1154 PNP SWITCH

Description

INFOID:0000000003895379

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

DTC Logic

INFOID:0000000003895380

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PNP POS SIG

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-62, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003895381

INSPECTION PROCEDURE

1.CHECK DATA MONITOR

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

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> GO TO 2

2.CHECK PARK/NEUTRAL POSITION (PNP) SWITCH

Perform Park/Neutral position switch inspection. Refer to TM-46, "Component Inspection".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> Repair or replace malfunctioning components.

Special Repair Requirement

INFOID:0000000004244453

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1155 BR FLUID LEVEL LOW

Description

INFOID:0000000003895382

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:0000000003895383

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BR FLUID LEVEL LOW

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-64, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003895384

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 connector and combination meter 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-22, "CONSULT-III Function (ABS)".

Is any item displayed on the self-diagnosis display?

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

2.CHECK BRAKE FLUID LEVEL SWITCH

Perform the brake fluid level switch component inspection. Refer to BRC-65, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3
NO >> Replace brake fluid level switch. Refer to BR-37, "Disassembly and Assembly".

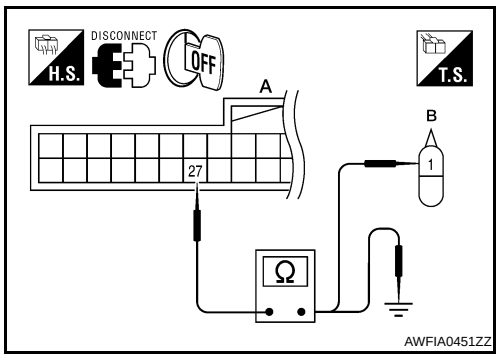
3.CHECK BRAKE FLUID LEVEL SWITCH HARNESS

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

27 - 1 : Continuity should exist.

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

27 - Ground : Continuity should not exist.



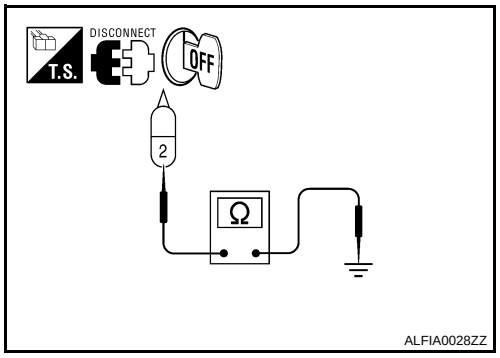
Is the inspection result normal?

YES >> GO TO 4
NO >> Repair or replace malfunctioning components.

4. CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

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

2 - Ground : Continuity should exist.



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″.

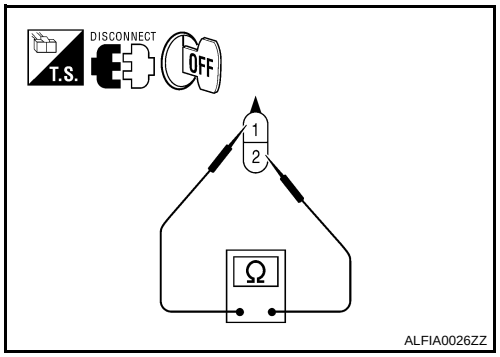
Component Inspection

INFOID:0000000003895385

1. CHECK BRAKE FLUID LEVEL SWITCH

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

Brake fluid level switch terminals	Condition	Continuity
1— 2	Brake fluid reservoir full	No
	Brake fluid reservoir empty	Yes



Is the inspection result normal?

YES >> Inspection End.
NO >> Replace brake fluid level switch. Refer to BR-37, "Disassembly and Assembly".

Special Repair Requirement

INFOID:0000000004244454

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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

>> END

C1156 ST ANG SEN COM CIR

Description

INFOID:0000000003895387

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:0000000003895388

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ST ANG SEN COM CIR

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-66, "Diagnosis Procedure".
NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003895389

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-22, "CONSULT-III Function (ABS)".

Self-diagnosis results
CAN COMM CIRCUIT
ST ANG SEN COM CIR

Is above displayed on the self-diagnosis display?

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

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000003895390

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:0000000003895391

DTC DETECTION LOGIC

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

Diagnosis Procedure

INFOID:0000000003895392

1.CHECK CONNECTOR

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-22, "CONSULT-III Function (ABS)".

Self-diagnosis results
CAN COMM CIRCUIT

Is above displayed on the self-diagnosis display?

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

PARKING BRAKE SWITCH

Description

INFOID:0000000003895393

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

Component Function Check

INFOID:0000000003895394

1.CHECK PARKING BRAKE SWITCH OPERATION

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

Condition	Brake warning lamp illumination
Parking brake engaged	ON
Parking brake not engaged	OFF

Is the inspection result normal?

YES >> Inspection End
NO >> Go to diagnosis procedure. Refer to BRC-68, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003895395

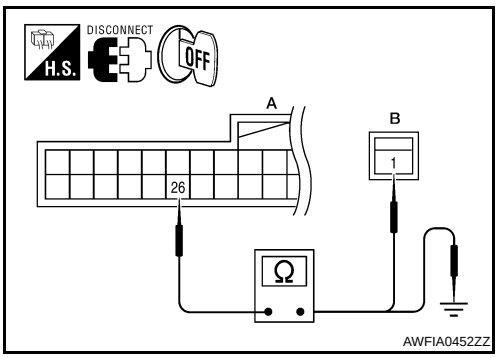
1.CHECK PARKING BRAKE SWITCH CIRCUIT

1. Disconnect combination meter connector and parking brake switch connector.
2. Check continuity between combination meter connector M24 (A) terminal 26 and parking brake switch connector E35 (B) terminal 1.

26 - 1 : Continuity should exist.

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

26 - Ground : Continuity should not exist.



Is the inspection result normal?

YES >> GO TO 2
NO >> Repair harness or connector.

2.CHECK PARKING BRAKE SWITCH

Perform parking brake switch component inspection. Refer to BRC-68, "Component Inspection".

Is the inspection result normal?

YES >> Check parking brake switch case ground condition.
NO >> Replace parking brake switch.

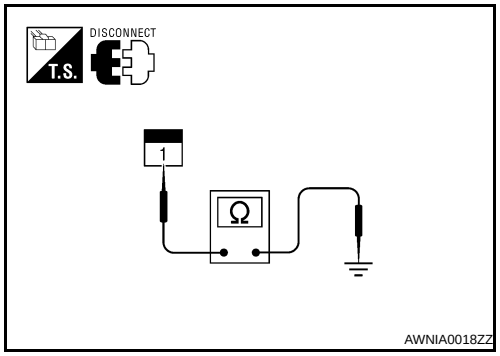
Component Inspection

INFOID:0000000003895396

INSPECTION PROCEDURE

1.CHECK PARKING BRAKE SWITCH

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



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

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace parking brake switch.

VDC OFF SWITCH

Description

INFOID:0000000003895397

VDC OFF switch deactivates (turn OFF) the VDC/TCS function when the VDC OFF switch is pressed.

Component Function Check

INFOID:0000000003895398

1.CHECK VDC OFF SWITCH OPERATION

Operate the VDC OFF switch and check that the VDC OFF indicator lamp in the combination meter turns on/off correctly.

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

Is the inspection result normal?

YES >> Inspection End
NO >> Go to diagnosis procedure. Refer to BRC-70, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003895399

INSPECTION PROCEDURE

1.CHECK VDC OFF SWITCH

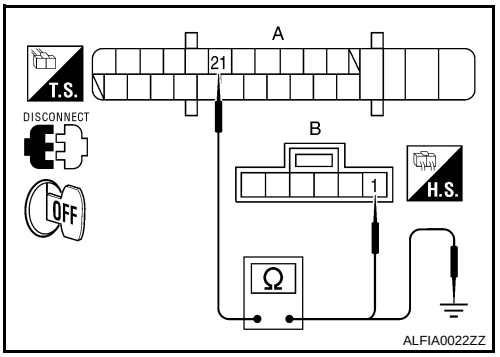
Perform VDC OFF switch component inspection. Refer to BRC-71, "Component Inspection".

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



ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E26 (A)	21	M72 (B)	1	Yes

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

ABS actuator and electric unit (control unit)		Ground	Continuity
Connector	Terminal		
E26 (A)	21	—	No

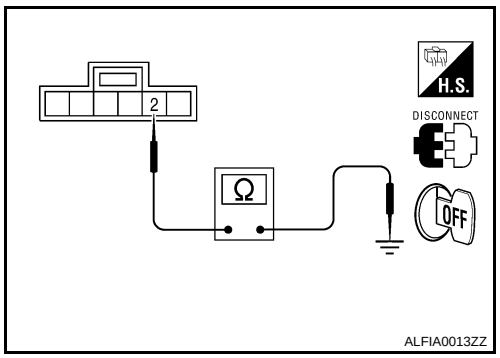
Is the inspection result normal?

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	—	No



Is the inspection result normal?

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

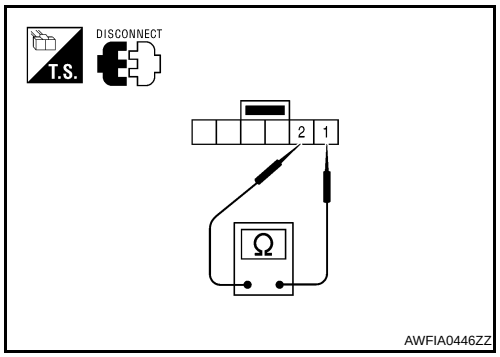
Component Inspection

INFOID:0000000003895400

INSPECTION PROCEDURE

1. CHECK VDC OFF SWITCH

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



VDC OFF switch terminals	Condition	Continuity
1 – 2	VDC OFF switch is pressed ON	Yes
	VDC OFF switch is pressed OFF	No

Is the inspection result normal?

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

ABS WARNING LAMP

Description

INFOID:0000000003895401

×: 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:0000000003895402

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-72, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003895403

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is the inspection result normal?

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

2.CHECK COMBINATION METER

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-144, "Removal and Installation".

BRAKE WARNING LAMP

Description

INFOID:0000000003895404

×: 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:0000000003895405

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-73, "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.

Is the inspection result normal?

YES >> Inspection End
NO >> Check parking brake switch. Refer to MWI-43, "Description".

Diagnosis Procedure

INFOID:0000000003895406

1.CHECK PARKING BRAKE SWITCH

Check that the brake warning lamp in the combination meter turns on/off correctly when operating the parking brake.

Is the inspection result normal?

YES >> GO TO 2
NO >> Check parking brake switch. Refer to MWI-43, "Description".

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is the inspection result normal?

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

3.CHECK COMBINATION METER

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-144, "Removal and Installation".

VDC OFF INDICATOR LAMP

Description

INFOID:0000000003895407

×: 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:0000000003895408

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-74, "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-70, "Description".

Diagnosis Procedure

INFOID:0000000003895409

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-70, "Diagnosis Procedure".

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is the inspection result normal?

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

3.CHECK COMBINATION METER

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-144, "Removal and Installation".

SLIP INDICATOR LAMP

Description

INFOID:0000000003895410

×: 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:0000000003895411

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-75, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003895412

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

Is the inspection result normal?

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

2.CHECK COMBINATION METER

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".
NO >> Repair or replace combination meter. Refer to MWI-144, "Removal and Installation".

ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000003895413

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FR LH SENSOR FR RH SENSOR RR LH SENSOR RR RH SENSOR	Wheel speed	0 [km/h]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
STOP LAMP SW	Brake pedal operation	When brake pedal is depressed	ON
		When brake pedal is not depressed	OFF
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
SLCT LVR POSI	A/T shift position	P position R position N position D position	N/P R N/P D
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
ENGINE RPM	With engine running	With engine stopped	0 rpm
		Engine running	Almost in accordance with tachometer display

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FLUID LEV SW	Brake fluid level switch	When brake fluid level switch ON	ON
		When brake fluid level switch OFF	OFF
PARK BRAKE SW	Parking brake switch	Parking brake switch is active	ON
		Parking brake switch is inactive	OFF
FR 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 valves	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	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 2)	When ABS warning lamp is ON	ON
		When ABS warning lamp is OFF	OFF
OFF LAMP	VDC OFF indicator lamp (Note 2)	When VDC OFF indicator lamp is ON	ON
		When VDC OFF indicator lamp is OFF	OFF
SLIP LAMP	SLIP indicator lamp (Note 2)	When SLIP indicator lamp is ON	ON
		When SLIP indicator lamp is OFF	OFF
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

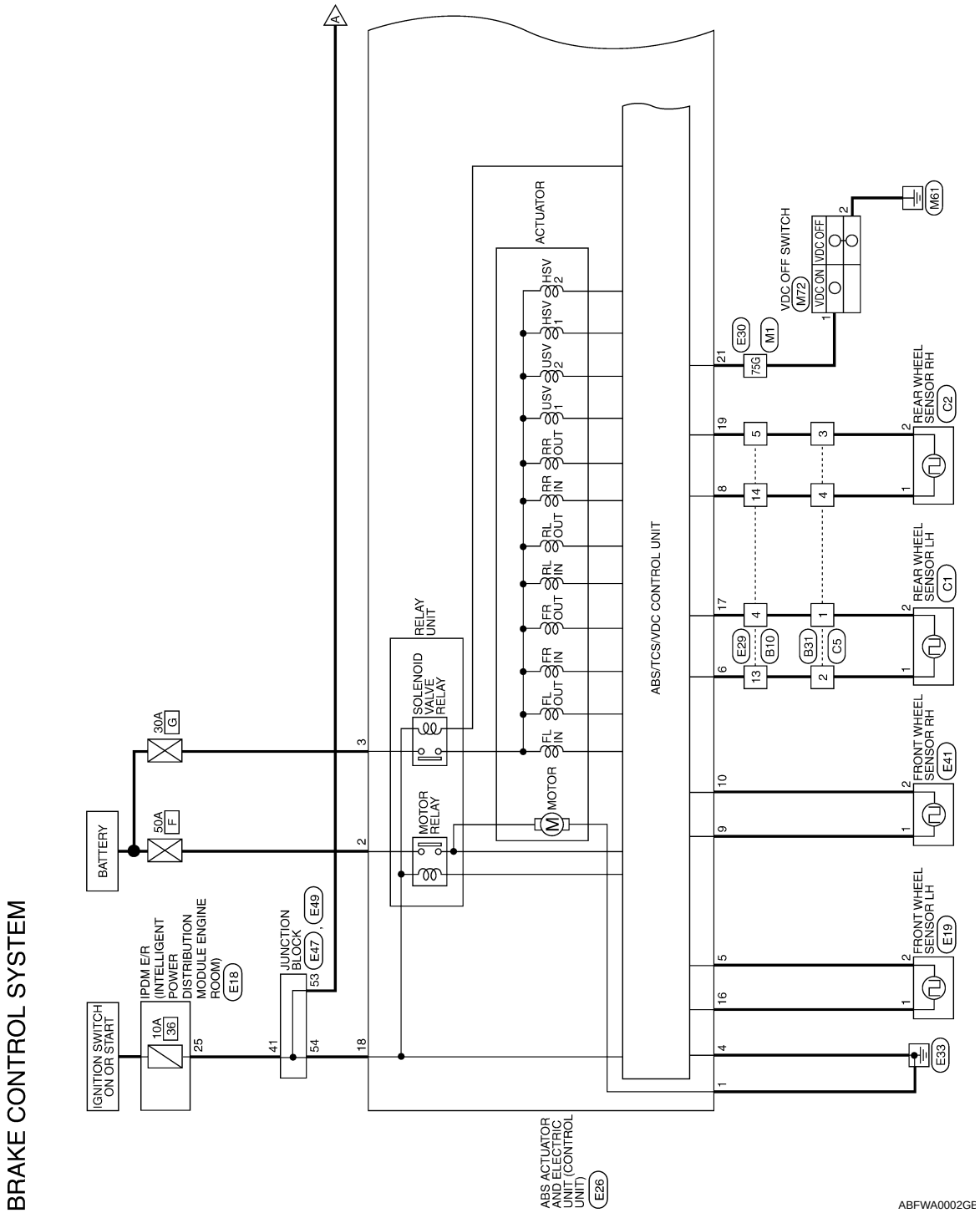
Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
TCS FAIL SIG	TCS fail-safe signal	In TCS fail-safe	ON
		TCS is normal	OFF
VDC FAIL SIG	VDC fail-safe signal	In VDC fail-safe	ON
		VDC is normal	OFF
CRANKING SIG	Crank operation	Crank is active	ON
		Crank is inactive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

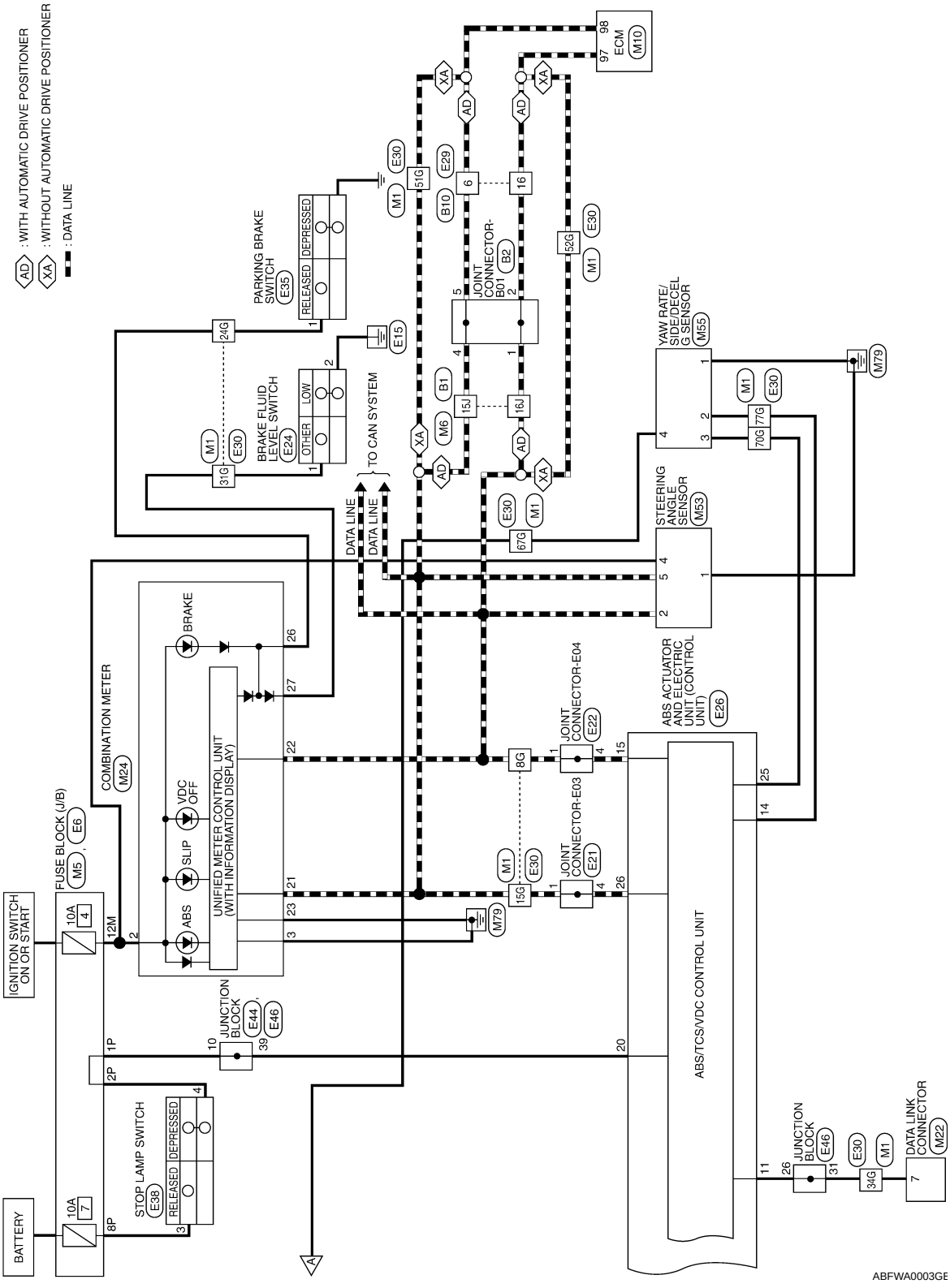
Note 1: Confirm tire pressure is normal.

Note 2: On and off timing for warning lamp and indicator lamp. Refer to BRC-10, "System Description".

Wiring Diagram

INFOID:0000000003895415




: WITH AUTOMATIC DRIVE POSITIONER
: WITHOUT AUTOMATIC DRIVE POSITIONER
: DATA LINE
ECM M10
JOINT CONNECTOR-B01 B2
PARKING BRAKE SWITCH E35
BRAKE FLUID LEVEL SWITCH E24
TO CAN SYSTEM
DATA LINE
DATA LINE
YAW RATE/ SIDE/DECEL G SENSOR M55
STEERING ANGLE SENSOR M53
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/TCS/VDC CONTROL UNIT
FUSE BLOCK (J/B) M5, E6
IGNITION SWITCH ON OR START
BATTERY
JUNCTION BLOCK E44, E46
STOP LAMP SWITCH E38
JUNCTION BLOCK E46
DATA LINK CONNECTOR M22
ABFWA0003GE

BRAKE CONTROL SYSTEM CONNECTORS

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

H.S.

9G	8G	7G	6G	5G	4G	3G	2G	1G
17G	16G	15G	14G	13G	12G	11G	10G	
26G	25G	24G	23G	22G	21G	20G		
34G	33G	32G	31G	30G	29G	28G	27G	19G 18G
	41G	40G	39G	38G	37G	36G	35G	
50G	49G	48G	47G	46G	45G	44G	43G	42G
58G	57G	56G	55G					
63G	62G	61G	60G	59G	54G	53G	52G	51G
72G	71G	70G	69G	68G	67G	66G		
80G	79G	78G	77G	76G	75G	74G	73G	65G 64G
	83G			82G			81G	

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

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

H.S.

5M	4M		3M	2M	1M
12M	11M	10M	9M	8M	7M	6M

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

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

9J	8J	7J	6J	5J	4J	3J	2J	1J
17J	16J	15J	14J	13J	12J	11J	10J	
25J	24J	23J	22J					
30J	29J	28J	27J	26J	21J	20J	19J	18J
	37J	36J	35J	34J	33J	32J	31J	
46J	45J	44J	43J	42J	41J	40J	39J	38J
55J	54J	53J	52J	51J	50J	49J		
63J	62J	61J	60J	59J	58J	57J	56J	48J 47J
70J	69J	68J	67J	66J	65J	64J		
79J	78J	77J	76J	75J	74J	73J	72J	71J
	87J	86J	85J	84J				
92J	91J	90J	89J	88J	83J	82J	81J	80J
	99J	98J	97J	96J	95J	94J	93J	

Terminal No.	Color of Wire	Signal Name
15J	L	–
16J	P	–

ABFIA0002GB

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

H.S.

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

Terminal No.	Color of Wire	Signal Name
7	O	–

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

H.S.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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

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	STEERING ANGLE SENS GND
2	P	CAN-L
4	O	STEERING ANGLE SENS POWER
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.	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	–

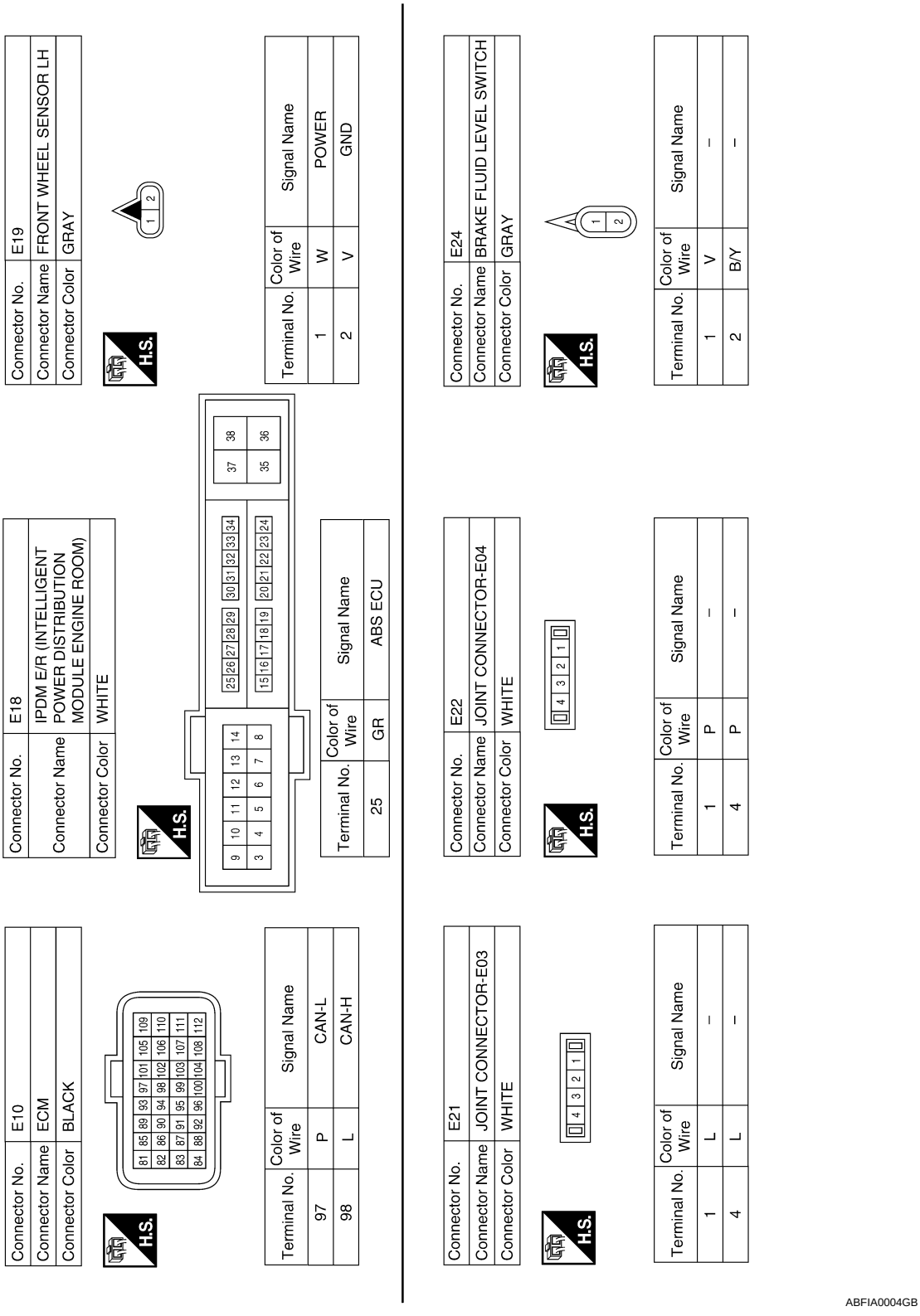
Connector No.	E6
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

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	–
8P	R	–

ABFIA0003GB



ABFIA0004GB

Terminal No.	Color of Wire	Signal Name
16	W	DP FL
17	O	DS RL
18	GR	UZ
19	BR	DS RR
20	SB	BLS
21	R	VDC OFF SW
22	–	–
23	–	–
24	–	–
25	V	CAN-P2
26	L	CAN-H

Terminal No.	Color of Wire	Signal Name
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	SB	CAN-M2
15	P	CAN-L

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

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)

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

H.S.

Terminal No.	Color of Wire	Signal Name
4	O	–
5	BR	–
6	L	–
13	G	–
14	L	–
16	P	–

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

H.S.

ABFIA0005GB

Connector No.	E35
Connector Name	PARKING BRAKE SWITCH
Connector Color	BLACK

H.S.

1

Terminal No.	Color of Wire	Signal Name
1	P	–

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

H.S.

3 4
1 2

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

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

H.S.

1 2

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

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	–

ABFIA0006GB

Connector No.	E49
Connector Name	JUNCTION BLOCK
Connector Color	BROWN

H.S.

Terminal No.	Color of Wire	Signal Name
53	W	–
54	GR	–

Connector No.	C1
Connector Name	REAR WHEEL SENSOR LH
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	POWER LH
2	O	SIG LH

Connector No.	C2
Connector Name	REAR WHEEL SENSOR RH
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	POWER RH
2	BR	SIG RH

Connector No.	B1
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
15J	L	–
16J	P	–

Connector No.	C5
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

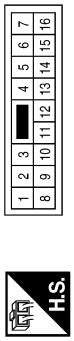
Terminal No.	Color of Wire	Signal Name
1	O	–
2	G	–
3	BR	–
4	LG	–

ABFIA0007GB

Connector No.	B31
Connector Name	WIRE TO WIRE
Connector Color	GRAY

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

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



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

ABFIA0008GB

Fail-Safe

INFOID:0000000003895416

CAUTION:

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

ABS, EBD SYSTEM

In case of an electrical malfunction with the ABS, ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp will turn on. In case of an electrical malfunction with the EBD system, brake warning lamp, ABS warning

lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. The system will revert to one of the following conditions of the fail-safe function.

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

VDC / TCS

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

DTC No. Index

INFOID:0000000003895417

DTC	Items (CONSULT-III screen terms)	Reference
C1101	RR RH SENSOR-1	BRC-27, "Description"
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	BRC-30, "Description"
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	
C1108	FR LH SENSOR- 2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-33, "Description"
C1110	CONTROLLER FAILURE	BRC-35, "DTC Logic"
C1111	PUMP MOTOR	BRC-36, "Description"
C1114	MAIN RELAY	BRC-38, "Description"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-40, "Description"
C1116	STOP LAMP SW	BRC-43, "Description"
C1120	FR LH IN ABS SOL	BRC-45, "Description"
C1122	FR RH IN ABS SOL	
C1124	RR LH IN ABS SOL	
C1126	RR RH IN ABS SOL	
C1121	FR LH OUT ABS SOL	BRC-48, "Description"
C1123	FR RH OUT ABS SOL	
C1125	RR LH OUT ABS SOL	
C1127	RR RH OUT ABS SOL	
C1130	ENGINE SIGNAL 1	BRC-51, "Description"
C1131	ENGINE SIGNAL 2	
C1132	ENGINE SIGNAL 3	
C1133	ENGINE SIGNAL 4	
C1136	ENGINE SIGNAL 6	
C1142	PRESS SEN CIRCUIT	BRC-52, "Description"
C1143	ST ANG SEN CIRCUIT	BRC-54, "Description"
C1144	ST ANG SEN SIGNAL	
C1145	YAW RATE SENSOR	BRC-56, "Description"
C1146	SIDE G-SEN CIRCUIT	

DTC	Items (CONSULT-III screen terms)	Reference
C1147	USV LINE [FL-RR]	BRC-59, "Description"
C1148	USV LINE [FR-RL]	
C1149	HSV LINE [FL-RR]	
C1150	HSV LINE [FR-RL]	
C1153	EMERGENCY BRAKE	BRC-35, "DTC Logic"
C1154	PNP POS SIG	BRC-62, "Description"
C1155	BR FLUID LEVEL LOW	BRC-64, "Description"
C1156	ST ANG SEN COM CIR	BRC-66, "Description"
C1170	VARIANT CODING	BRC-35, "DTC Logic"
U1000	CAN COMM CIRCUIT	BRC-67, "Description"

SYMPTOM DIAGNOSIS

VDC/TCS/ABS

Symptom Table

INFOID:0000000003895418

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

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	BRC-91, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-92, "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-93, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-94, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-95, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)	BRC-96, "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:0000000003895419

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-100, "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 >> Normal
NO >> Perform self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000003895420

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-15, "Bleeding Brake System".
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to brake pedal BR-13, "Inspection and Adjustment", brake booster BR-8, "Inspection" and master cylinder BR-10, "Inspection".

NO >> GO TO 2

2.CHECK FUNCTION

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

Is the inspection result normal?

YES >> GO TO procedure 3 “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom 1. Refer to BRC-91, "Diagnosis Procedure".

NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000003895421

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

1.CHECK FUNCTION

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

Is the inspection result normal?

YES >> GO TO procedure “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom. Refer to BRC-91, "Diagnosis Procedure".

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000003895422

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

1. CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> GO TO procedure “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom. Refer to BRC-91, "Diagnosis Procedure".

NO >> Perform self-diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000003895423

CAUTION:

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

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

1.SYMPTOM CHECK 1

Check if there is pedal vibration or operation sound when the engine is started.

Do symptoms occur?

YES >> GO TO 2

NO >> Perform self -diagnosis. Refer to BRC-22, "CONSULT-III Function (ABS)".

2.SYMPTOM CHECK 2

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

Do symptoms occur?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.

NO >> GO TO procedure “CHECK WHEEL SENSOR AND SENSOR ROTOR” of symptom. Refer to BRC-91, "Diagnosis Procedure".

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000003895424

1.SYMPTOM CHECK

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

Is the inspection result normal?

YES >> Normal.
NO >> GO TO 2

2.CHECK SELF-DIAGNOSIS RESULTS

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

Are self-diagnosis results indicated?

YES >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis.
NO >> GO TO 3

3.CHECK CONNECTOR

- Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector and check terminal for deformation, disconnection, looseness, etc.
- Securely connect connector and perform ABS actuator and electric unit (control unit) self-diagnosis.

Are self-diagnosis results indicated?

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

4.CHECK ECM AND A/T SELF-DIAGNOSIS RESULTS

Perform ECM and CVT self-diagnosis.

Are self-diagnosis results indicated?

YES >> Check the corresponding items.
- ECM: Refer to EC-123, "CONSULT-III Function".
- CVT: Refer to TM-35, "CONSULT-III Function (TRANSMISSION)".

NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-103, "Removal and Installation".

PRECAUTION

PRECAUTIONS

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

INFOID:0000000003895425

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

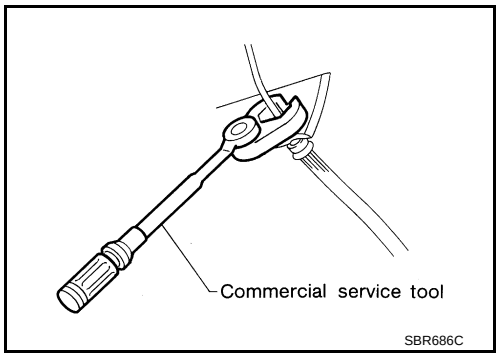
WARNING:

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

Precaution for Brake System

INFOID:0000000003895426

- Always use recommended brake fluid. Refer to MA-17, "FOR NORTH AMERICA : Fluids and Lubricants" (for North America) or MA-18, "FOR MEXICO : Fluids and Lubricants" (for Mexico).
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted surface of body. If brake fluid is splashed on painted surfaces of body immediately wipe off with cloth and then wash it away with water.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect connectors of ABS actuator and electric unit (control unit) or the battery cable from the negative terminal.



WARNING:

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

Precaution for Brake Control

INFOID:0000000003895427

- Just after starting vehicle with 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.

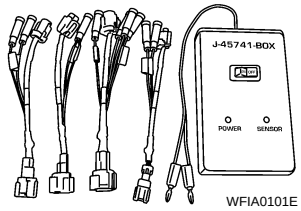
PREPARATION

PREPARATION

Special Service Tool

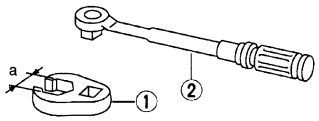
INFOID:0000000003895428

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

Tool number (Kent-Moore No.) Tool name	Description
— (J-45741) ABS active wheel sensor tester  WFIA0101E	Checking operation of ABS active wheel sensor

Commercial Service Tool

INFOID:0000000003895429

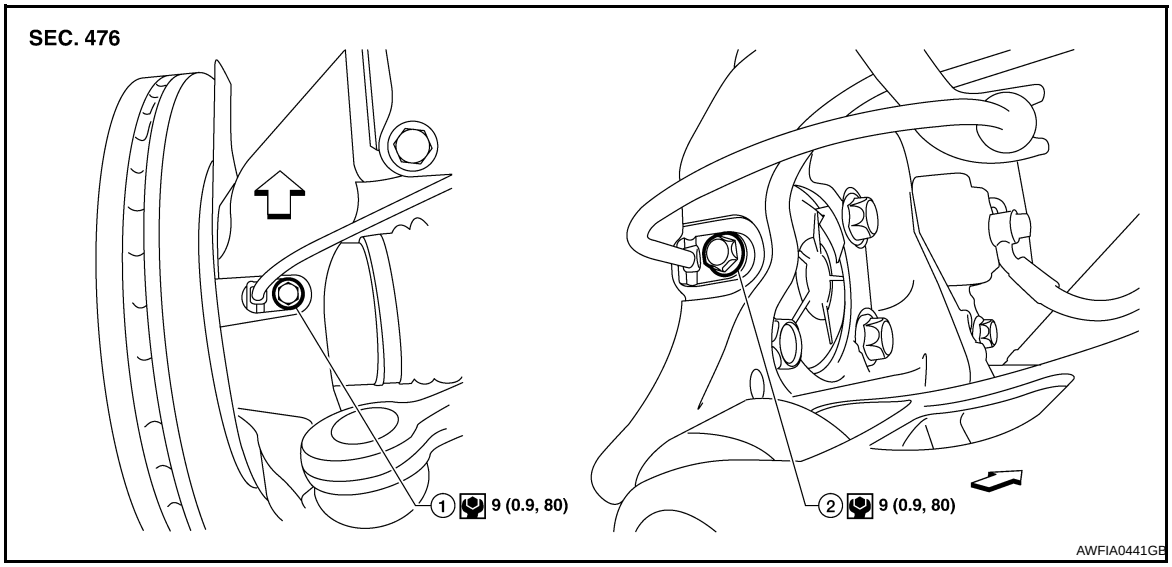
Tool name	Description
1. Flare nut crowfoot 2. Torque wrench  S-NT360	Removing and installing brake piping **a: 10mm (0.39 in)/12mm (0.47 in)**

ON-VEHICLE REPAIR

WHEEL SENSORS

Removal and Installation

INFOID:0000000003895430



1. Front wheel sensor
2. Rear wheel sensor
⇦ Front

CAUTION:

- **Be careful not to damage wheel sensor edge and sensor rotor teeth.**
- **When pulling out the wheel sensor, be careful to turn it as little as possible. Do not pull on the wheel sensor harness.**
- **Check if foreign objects such as iron fragments are adhered to the pick-up part of the sensor or to the inside of the hole for the wheel sensor, or if a foreign object is caught in the surface of the mating surface for the wheel sensor. Repair as necessary and then install the wheel sensor.**

FRONT WHEEL SENSOR

Removal

1. Remove the front wheel and tire. Refer to WT-62, "Adjustment".
2. Partially remove front wheel fender protector and reposition out of the way. Refer to EXT-20, "Removal and Installation".
3. Disconnect the wheel sensor harness connector.
4. Remove the wheel sensor harness from the brackets.
5. Remove the wheel sensor bolt and wheel sensor from the front hub assembly.

Installation

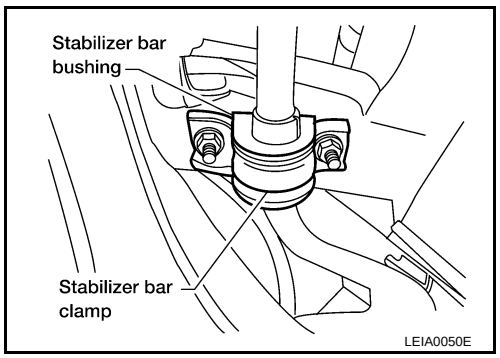
Installation is in the reverse order of removal.

REAR WHEEL SENSOR

Removal

1. Remove the rear wheel and tire. Refer to WT-62, "Adjustment".

2. Remove the stabilizer bar clamps and bushings using power tool, and reposition the stabilizer bar out of the way.



3. Disconnect the wheel sensor harness connector.
4. Remove the wheel sensor harness from the brackets.
5. Remove the wheel sensor bolt and wheel sensor from the rear hub assembly.

Installation

Installation is in the reverse order of removal.

SENSOR ROTOR

Removal and Installation

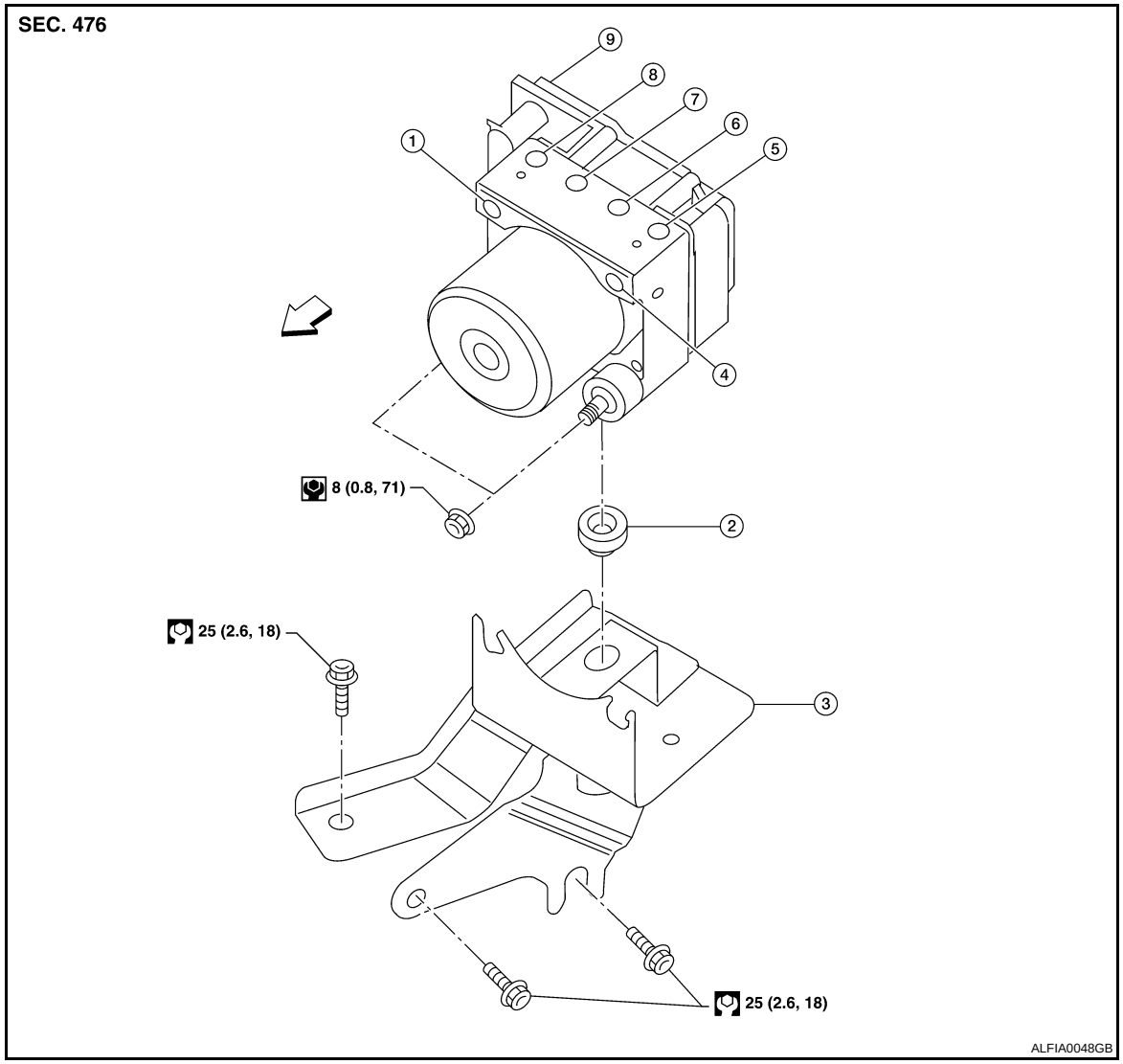
INFOID:0000000003895431

The front and rear wheel sensor rotors are an integral part of the wheel hub assemblies and cannot be disassembled. To replace the sensor rotor, replace the wheel hub assembly. Refer to FAX-8, "Removal and Installation" (Front), RAX-7, "Removal and Installation" (Rear).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:0000000003895432



1. From master cylinder secondary side
2. Grommet
3. ABS actuator and electric unit (control unit) 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:0000000003895433

CAUTION:

- **Before removal, disconnect the battery negative terminal.**
- **To disconnect the brake tubes, use a flare nut wrench to prevent the flare nuts and brake tubes from being damaged. To connect the brake tubes, use a flare nut torque wrench to tighten to the specified torque.**
- **Do not drop the ABS actuator and electric unit (control unit).**
- **Do not remove and install the ABS actuator and electric unit (control unit) by holding it by the harness.**
- **After installation, bleed the air from the brake lines. Refer to BR-15, "Bleeding Brake System".**

REMOVAL

1. Disconnect the battery negative terminal.
2. Drain the brake fluid. Refer to BR-15, "Drain and Refill".
   CAUTION:
   Do not reuse the brake fluid.
3. Remove the front wiper arms. Refer to WW-92, "FRONT WIPER ARMS : Removal and Installation".
4. Remove the cowl top and RH cowl top extension. Refer to EXT-18, "Removal and Installation".
5. Disconnect the wiper washer hose.
6. Remove the tower bar. Refer to FSU-13, "Exploded View".
7. Disconnect the ABS actuator and electric unit (control unit) connector.
8. Loosen the brake tube flare nuts, then disconnect the brake tubes from the ABS actuator and electric unit (control unit).
9. Remove the ABS actuator and electric unit (control unit) nuts.
10. Remove the ABS actuator and electric unit (control unit).
11. Remove the ABS actuator and electric unit (control unit) bracket as necessary.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Perform the neutral position adjustment for the steering angle sensor. Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

G SENSOR

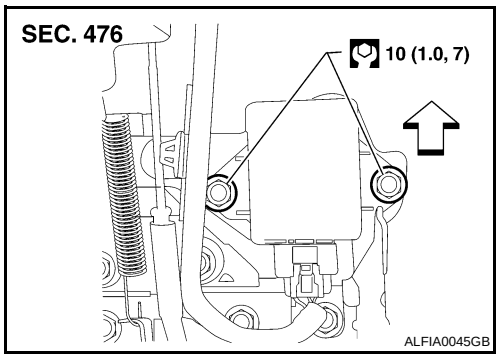
Removal and Installation

INFOID:0000000003895434

CAUTION:
- **Do not drop or strike the yaw rate/side G sensor to prevent damage.**
- **Do not use power tool to remove the yaw rate/side G sensor to prevent damage.**

REMOVAL

1. Remove the center console. Refer to IP-16, "Removal and Installation".
2. Disconnect the yaw rate/side G sensor connector.
3. Remove the yaw rate/side G sensor nuts.
   - ⇦: Front
4. Remove the yaw rate/side G sensor.



INSTALLATION

Installation is in the reverse order of removal.

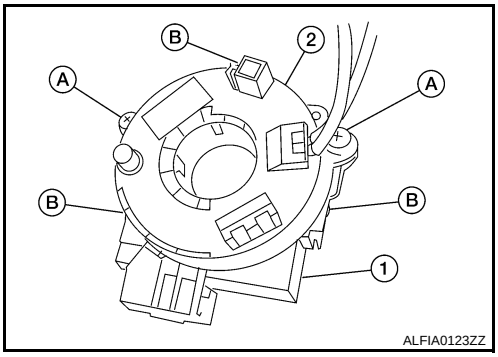
STEERING ANGLE SENSOR

Removal and Installation

INFOID:0000000003895435

REMOVAL

1. Remove the spiral cable. Refer to SR-8, "Removal and Installation".
2. Remove the screws (A) and release the clips (B) to remove the steering angle sensor (1) from the 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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".