

SECTION

BRC

BRAKE CONTROL SYSTEM

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001731351

PRECAUTIONS FOR DIAGNOSIS

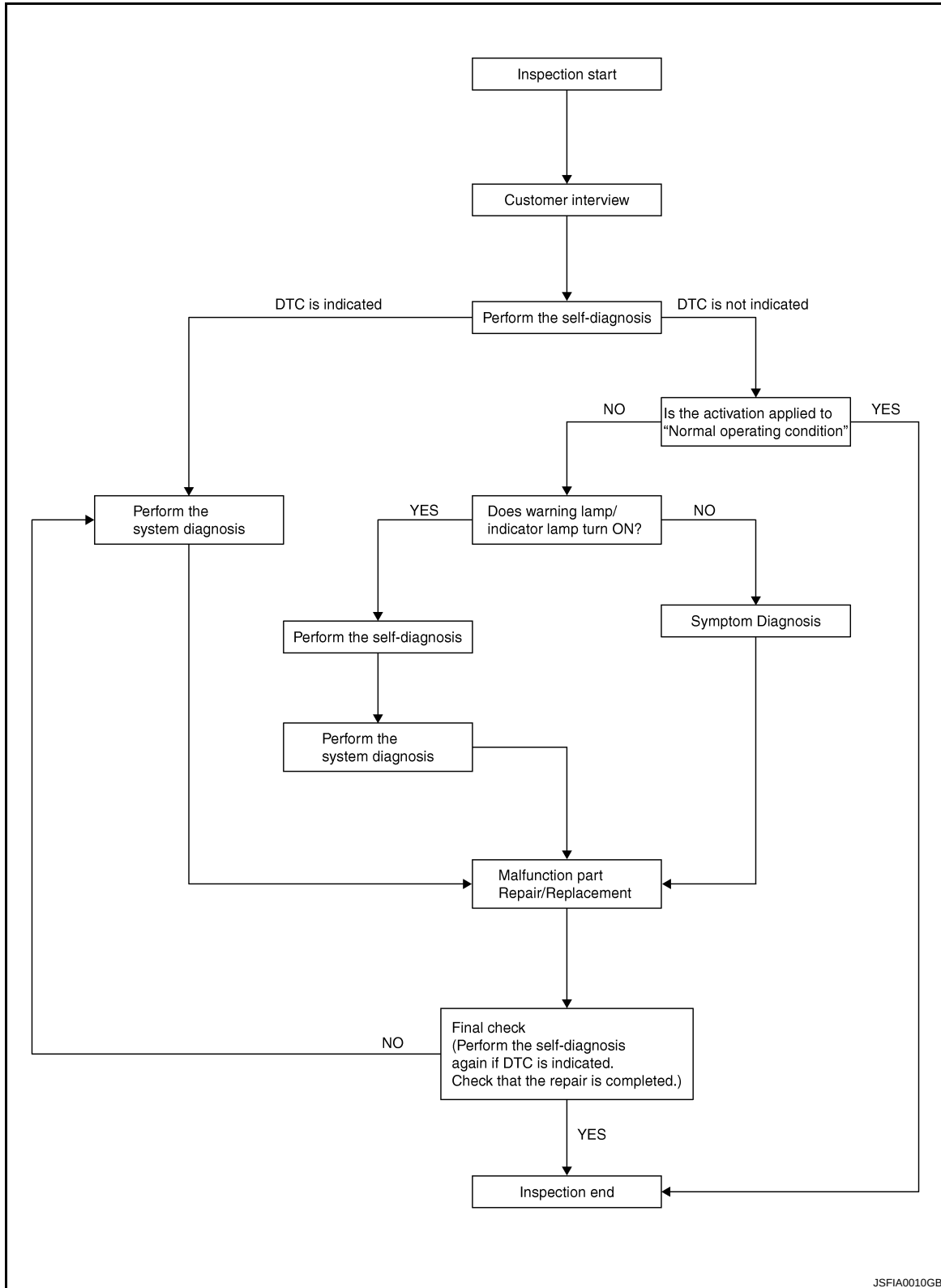
If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

DIAGNOSIS AND REPAIR WORKFLOW

[ABS]

< BASIC INSPECTION >

OVERALL SEQUENCE



DETAILED FLOW

1.COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to [BRC-89, "Diagnostic Work Sheet"](#).

>> GO TO 2

DIAGNOSIS AND REPAIR WORKFLOW

[ABS]

< BASIC INSPECTION >

2.PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function. Refer to [BRC-25, "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-71, "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-79, "Description"](#).

Is the symptom a normal operation?

YES >> INSPECTION END

NO >> GO TO 5

5.CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.

- ABS warning lamp: Refer to [BRC-60, "Description"](#).
- Brake warning lamp: Refer to [BRC-61, "Description"](#).
- VDC OFF indicator lamp: Refer to [XX-XX, "*****"](#).
- SLIP indicator lamp: Refer to [XX-XX, "*****"](#).

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-25, "CONSULT-III Function \(ABS\)"](#).

Is no other DTC present and the repair completed?

YES >> INSPECTION END

NO >> GO TO 3

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[ABS]

Diagnostic Work Sheet

INFOID:000000001731352

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:0000000001731353

After replacing the ABS actuator and electric unit (control unit), perform the following procedures:

- Neutral position adjustment for the steering angle sensor
- Calibration of the decel G sensor

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement

INFOID:0000000001731354

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#), GO TO 2

2.PERFORM CALIBRATION OF THE DECEL G SENSOR

Perform calibration of the decel G sensor.

>> Refer to [BRC-92, "CALIBRATION OF DECEL G SENSOR : Special Repair Requirement"](#).

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:0000000001731355

Refer to the table below to determine if adjustment of steering angle sensor neutral position is required.

x: 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)	x
Removing/Installing steering angle sensor	x
Replacing steering angle sensor	x
Removing/Installing steering components	x
Replacing steering components	x
Removing/Installing suspension components	x
Replacing suspension components	x
Change tires to new ones	—
Tire rotation	—
Adjusting wheel alignment	x

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement

INFOID:0000000001731356

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.

INSPECTION AND ADJUSTMENT

[ABS]

< BASIC INSPECTION >

>> GO TO 2

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

1. On the CONSULT-III screen, touch "WORK SUPPORT" and "ST ANG SEN ADJUSTMENT" in order.
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, it ends automatically.

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

CAUTION:

Be sure to perform above operation.

>> GO TO 3

3.CHECK DATA MONITOR

1. Run vehicle with front wheels in straight-ahead position, then stop.
2. Select "DATA MONITOR". Then make sure "STR ANGLE SIG" is within $0 \pm 2.5^\circ$.

Is the steering angle within the specified range?

YES >> GO TO 4

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

4.ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).
- ECM, refer to:
 - [EC-107, "CONSULT-III Function"](#) (HR16DE with EURO-OBD)
 - [EC-462, "CONSULT-III Function"](#) (HR16DE without EURO-OBD)
 - [EC-772, "CONSULT-III Function"](#) (MR18DE)
 - [EC-1104, "Diagnosis Description"](#) (K9K)

Are the memories erased?

YES >> INSPECTION END

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

CALIBRATION OF DECEL G SENSOR

CALIBRATION OF DECEL G SENSOR : Description

INFOID:000000001731357

Refer to the table below to determine if calibration of the decel G sensor is required.

x: Required –: Not required

Situation	Calibration of decel G sensor
Removing/Installing ABS actuator and electric unit (control unit)	—
Replacing ABS actuator and electric unit (control unit)	x
Removing/Installing steering angle sensor	x
Replacing steering angle sensor	x
Removing/Installing steering components	x
Replacing steering components	x
Removing/Installing suspension components	x
Replacing suspension components	x
Change tires to new ones	—
Tire rotation	—
Adjusting wheel alignment	x

CALIBRATION OF DECEL G SENSOR : Special Repair Requirement

INFOID:000000001731358

CALIBRATION OF DECEL G SENSOR

CAUTION:

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

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2

2. PERFORM CALIBRATION OF DECEL G SENSOR

-
1. On the CONSULT-III screen, touch "WORK SUPPORT" and "DECEL G SEN CALIBRATION" in order.
 2. Touch "START".
 3. After approximately 10 seconds, touch "END".

NOTE:

After approximately 60 seconds, it ends automatically.

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

CAUTION:

Be sure to perform above operation.

>> GO TO 3

3. CHECK DATA MONITOR

-
1. Run vehicle with front wheels in straight-ahead position, then stop.
 2. Select "DATA MONITOR". Then make sure "DECEL G SEN" is within $\pm$.

Is the inspection result normal?

YES >> GO TO 4

NO >> Perform calibration of decel G sensor again, GO TO 1

4. ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).
- ECM, refer to:
 - [EC-107, "CONSULT-III Function"](#) (HR16DE with EURO-OBD)
 - [EC-462, "CONSULT-III Function"](#) (HR16DE without EURO-OBD)
 - [EC-772, "CONSULT-III Function"](#) (MR18DE)
 - [EC-1104, "Diagnosis Description"](#) (K9K)

Are the memories erased?

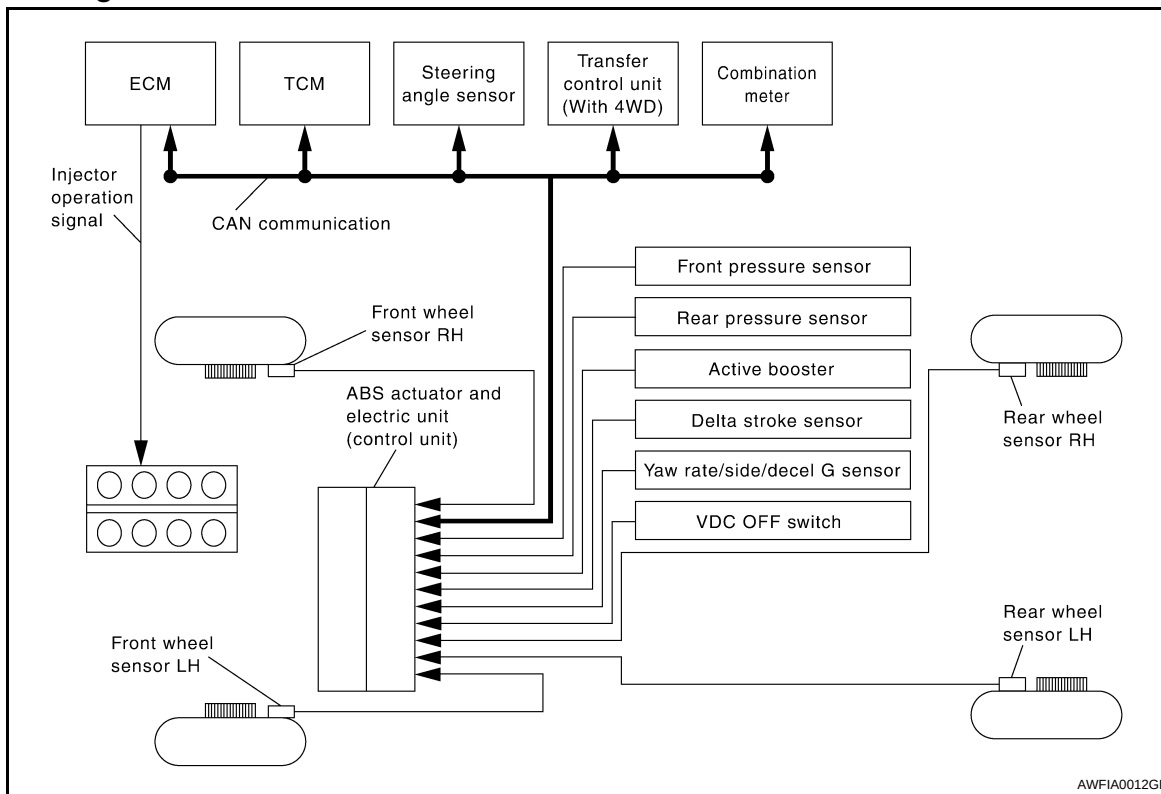
YES >> INSPECTION END

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

FUNCTION DIAGNOSIS

VDC

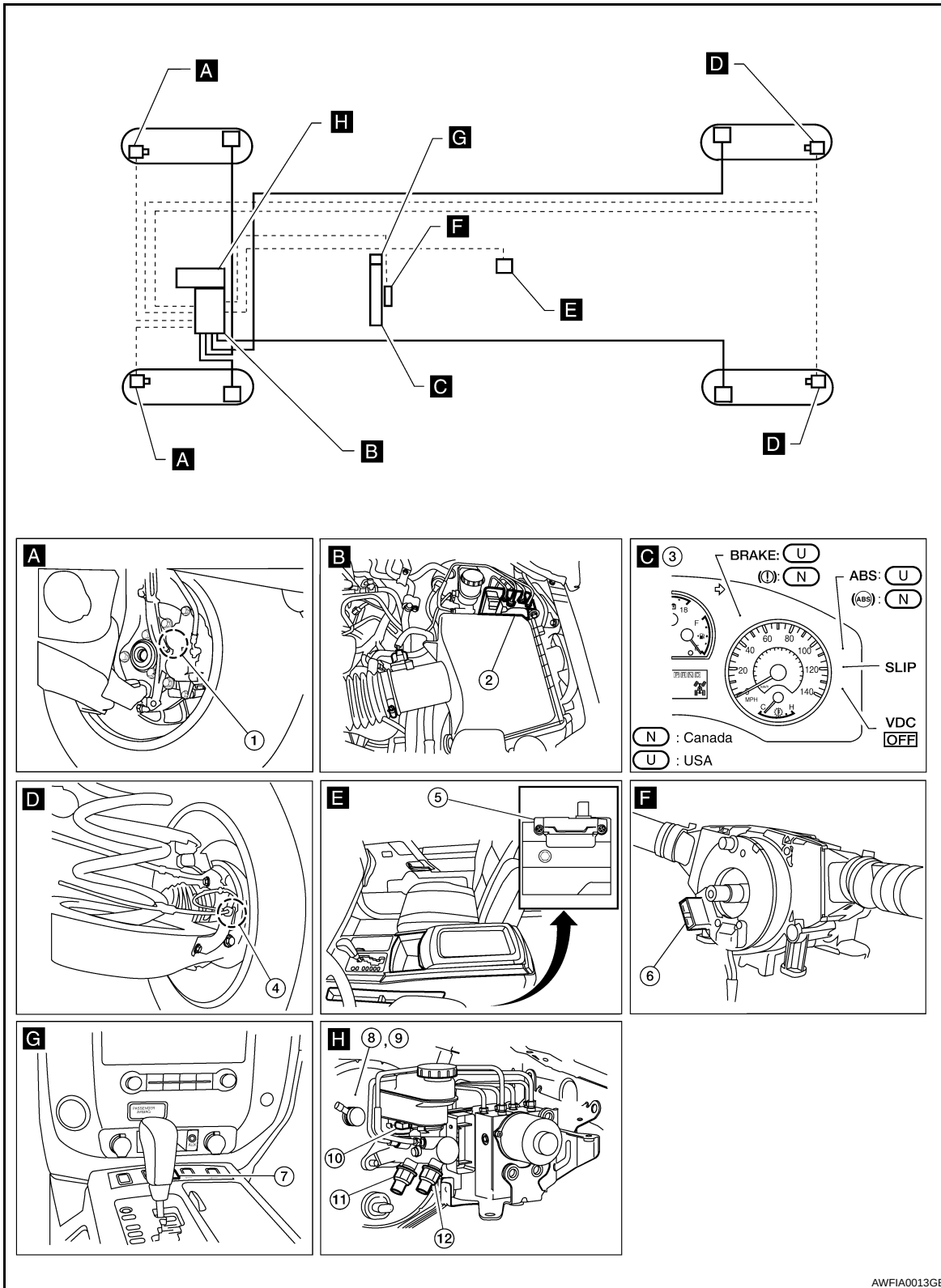
System Diagram



System Description

INFOID:0000000001731209

- Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from steering angle sensor and pressure sensors. Using information from yaw rate/side/decel G sensor and wheel sensor, VDC judges driving condition (conditions of under steer and over steer) to improve vehicle driving stability by controlling brake application to 4 wheels and engine output.
- During VDC operation, it informs driver of system operation by flashing SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.



< FUNCTION DIAGNOSIS >

- | | | | |
|--|---|---|---|
| 1. Front wheel sensor
LH E18
RH E117 | 2. ABS actuator and electric unit (control unit) E125 | 3. Combination meter M24 | A |
| 4. Rear wheel sensor
LH C11
RH C10 | 5. Yaw rate/side/decel G sensor M108 | 6. Steering angle sensor M17 (view with steering wheel removed) | B |
| 7. VDC OFF switch M257 | 8. Active booster E49 | 9. Delta stroke sensor E114 | C |
| 10. Brake fluid level switch E21 | 11. Front pressure sensor E31 | 12. Rear pressure sensor E32 | |

Component Description

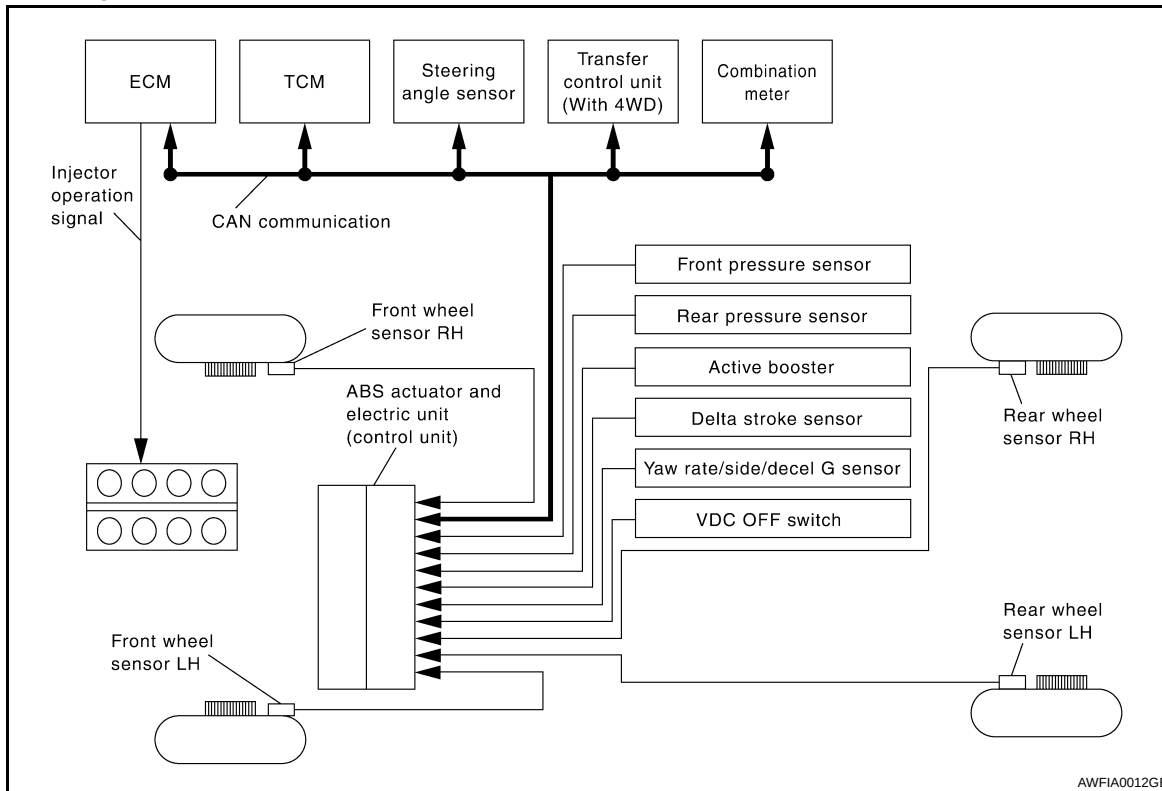
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Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-39, "Description"
	Motor	
	Actuator relay	BRC-54, "Description"
	Solenoid valve	BRC-46, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	XX-XX, "*****"
Wheel sensor		BRC-30, "Description"
Yaw rate/side/decel G sensor		XX-XX, "*****"
Steering angle sensor		XX-XX, "*****"
VDC OFF switch		XX-XX, "*****"
ABS warning lamp		BRC-60, "Description"
Brake warning lamp		BRC-61, "Description"
VDC OFF indicator lamp		XX-XX, "*****"
SLIP indicator lamp		XX-XX, "*****"
Front pressure sensor		XX-XX, "*****"
Rear pressure sensor		
Active booster		XX-XX, "*****"
Delta stroke sensor		XX-XX, "*****"

TCS

System Diagram

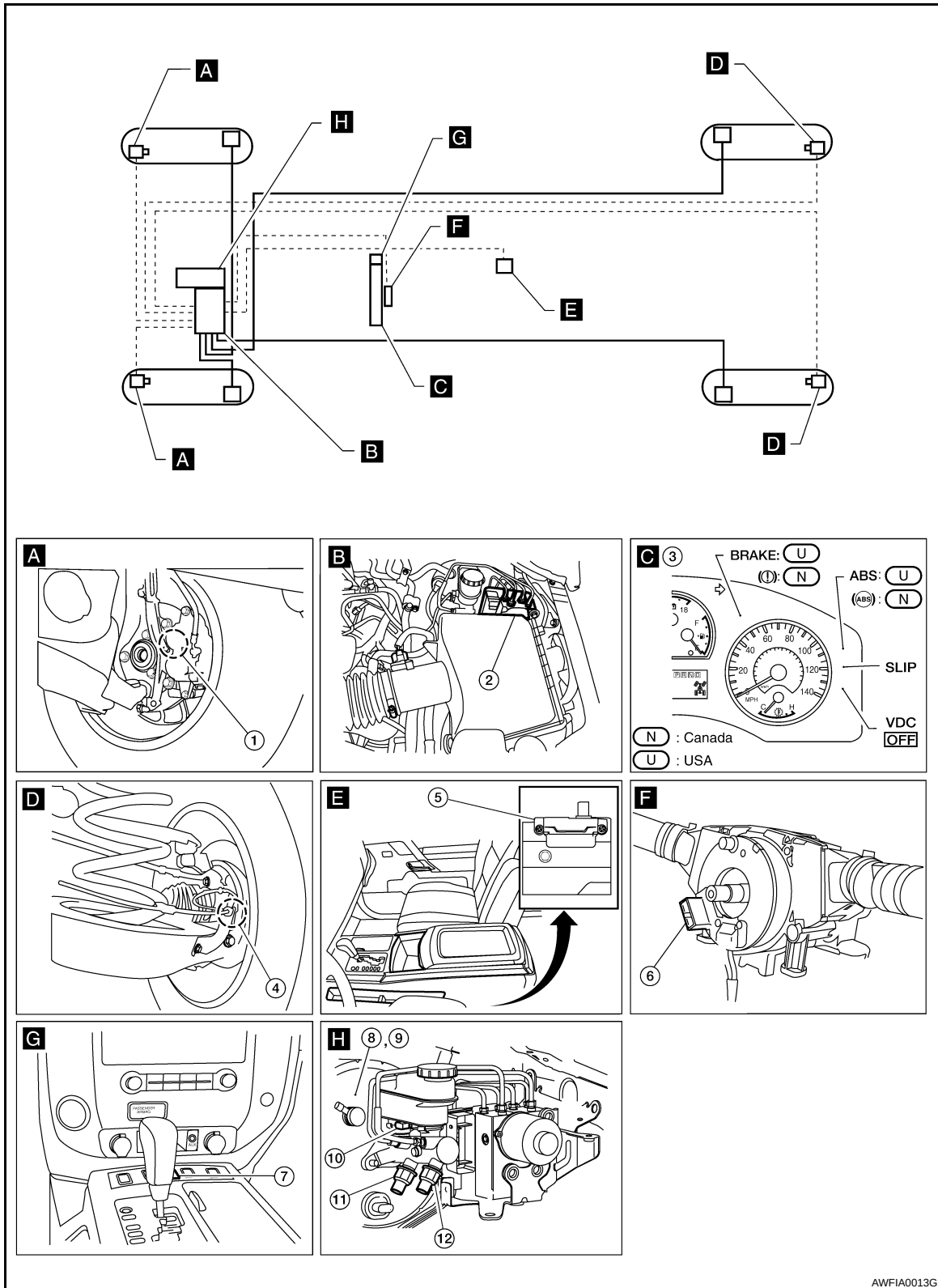
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System Description

INFOID:0000000001731213

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



< FUNCTION DIAGNOSIS >

- | | | |
|--|---|---|
| 1. Front wheel sensor
LH E18
RH E117 | 2. ABS actuator and electric unit (control unit) E125 | 3. Combination meter M24 |
| 4. Rear wheel sensor
LH C11
RH C10 | 5. Yaw rate/side/decel G sensor M108 | 6. Steering angle sensor M17 (view with steering wheel removed) |
| 7. VDC OFF switch M257 | 8. Active booster E49 | 9. Delta stroke sensor E114 |
| 10. Brake fluid level switch E21 | 11. Front pressure sensor E31 | 12. Rear pressure sensor E32 |

Component Description

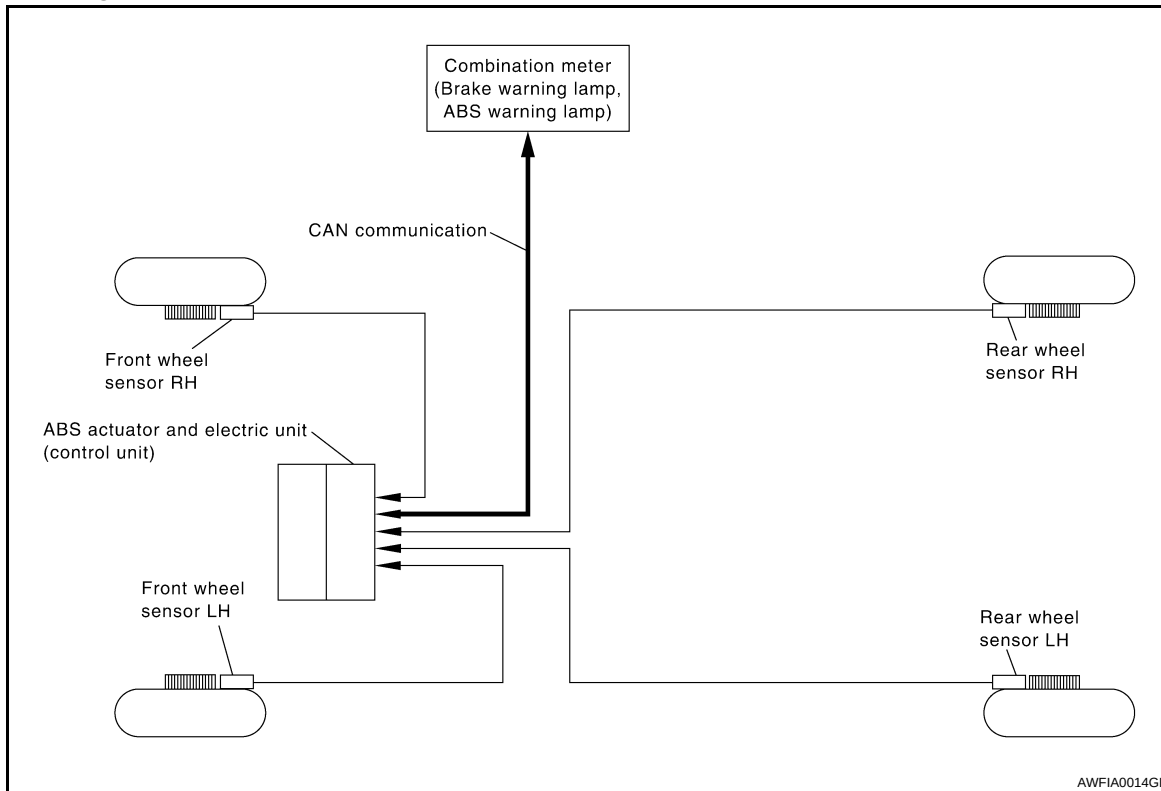
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Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-39, "Description"
	Motor	
	Actuator relay	BRC-54, "Description"
	Solenoid valve	BRC-46, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	XX-XX, "*****"
Wheel sensor		BRC-30, "Description"
Yaw rate/side/decel G sensor		XX-XX, "*****"
Steering angle sensor		XX-XX, "*****"
VDC OFF switch		XX-XX, "*****"
ABS warning lamp		BRC-60, "Description"
Brake warning lamp		BRC-61, "Description"
VDC OFF indicator lamp		XX-XX, "*****"
SLIP indicator lamp		XX-XX, "*****"
Front pressure sensor		XX-XX, "*****"
Rear pressure sensor		
Active booster		XX-XX, "*****"
Delta stroke sensor		XX-XX, "*****"

ABS

System Diagram

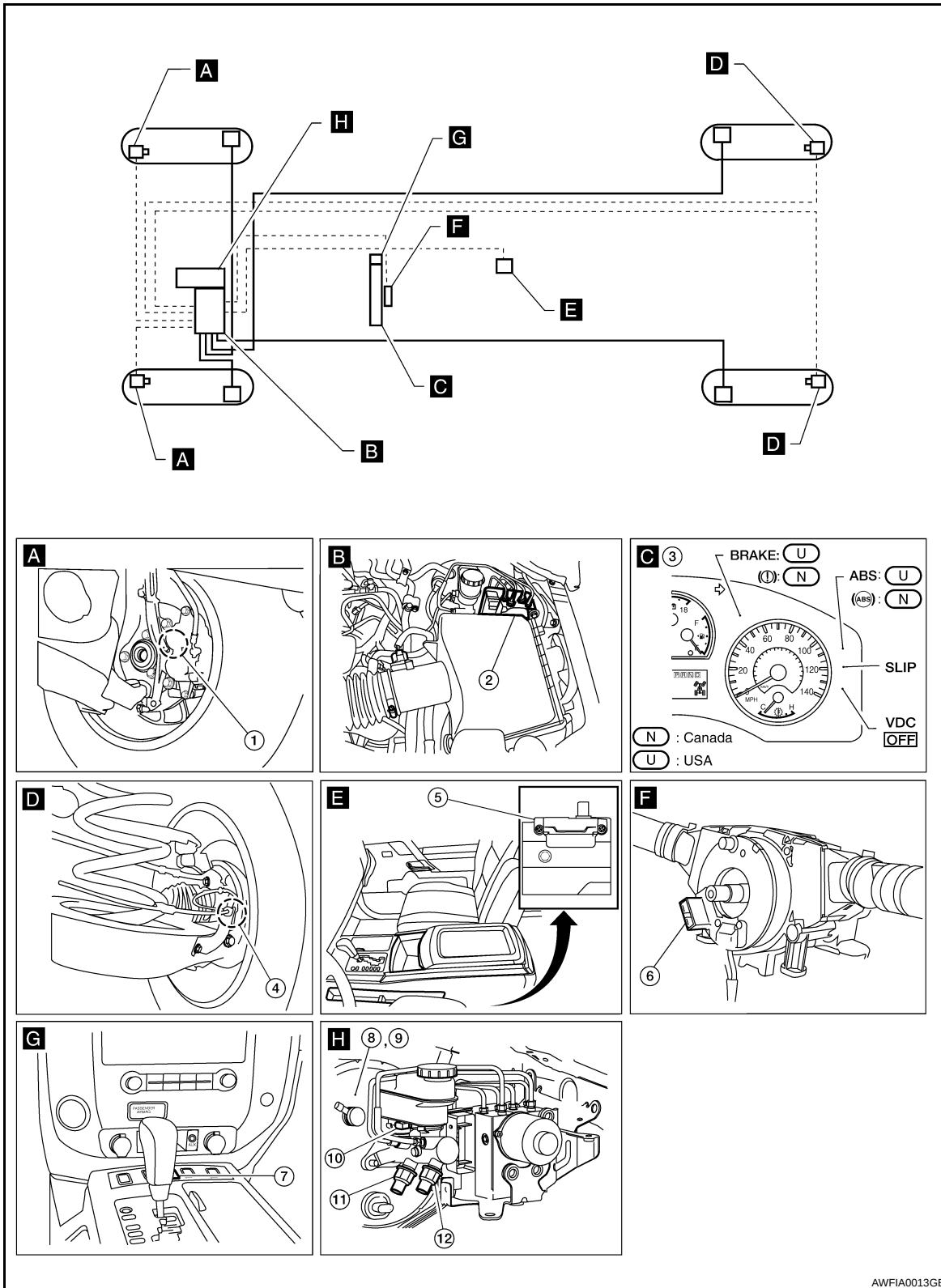
INFOID:000000001731216



System Description

INFOID:000000001731217

- 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.



1. Front wheel sensor
LH E18
RH E117

4. Rear wheel sensor
LH C11
RH C10

7. VDC OFF switch M257

10. Brake fluid level switch E21
2. ABS actuator and electric unit (control unit) E125

5. Yaw rate/side/decel G sensor M108

8. Active booster E49

11. Front pressure sensor E31
3. Combination meter M24

6. Steering angle sensor M17 (view with steering wheel removed)

9. Delta stroke sensor E114

12. Rear pressure sensor E32

Component Description

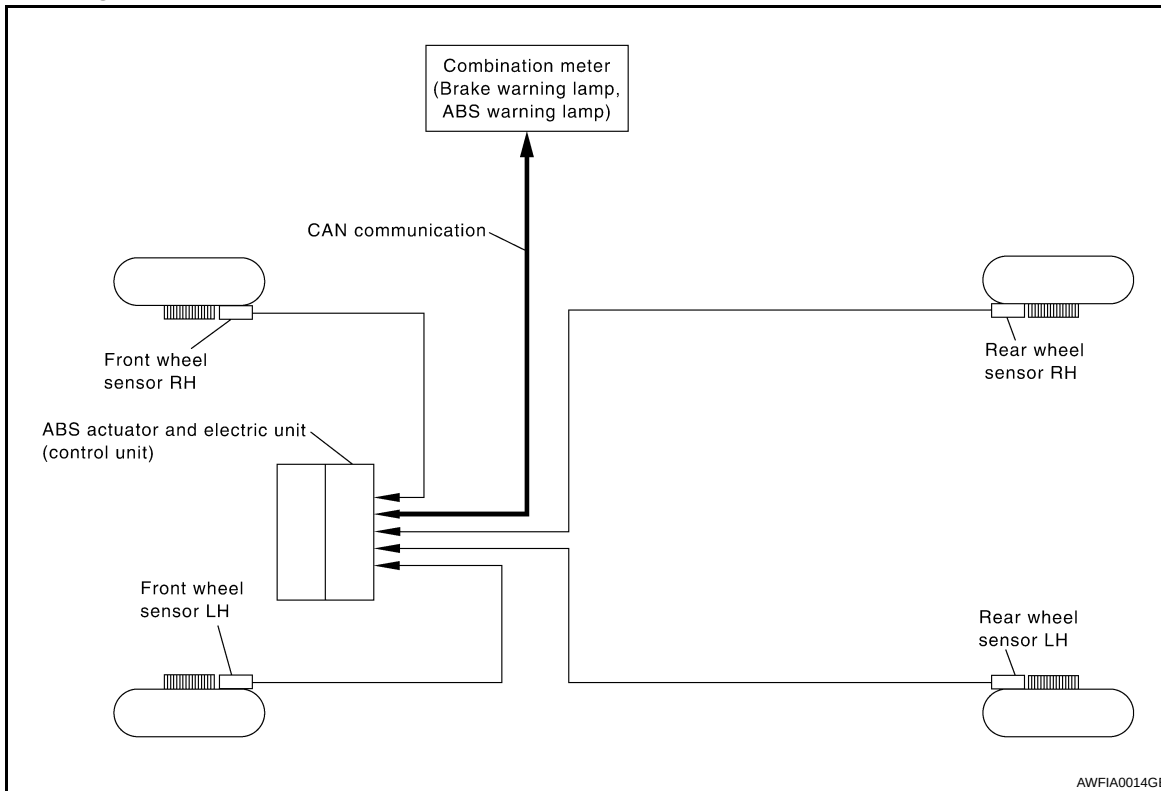
INFOID:000000001731219

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-39, "Description"
	Motor	
	Actuator relay	BRC-54, "Description"
	Solenoid valve	BRC-46, "Description"
Wheel sensor		BRC-30, "Description"
ABS warning lamp		BRC-60, "Description"
Brake warning lamp		BRC-61, "Description"

EBD

System Diagram

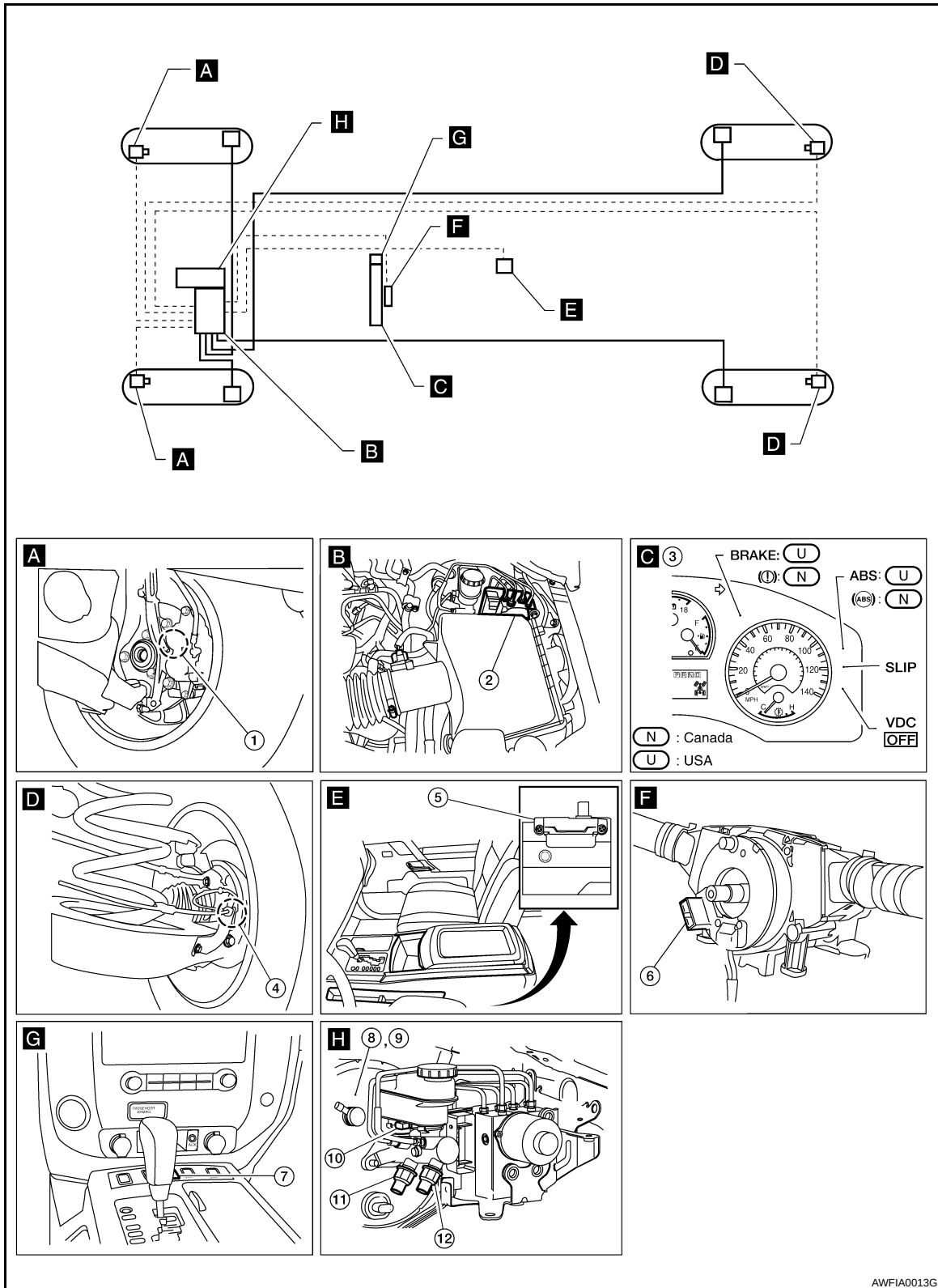
INFOID:000000001731220



System Description

INFOID:000000001731221

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



< FUNCTION DIAGNOSIS >

- | | | |
|--|---|---|
| 1. Front wheel sensor
LH E18
RH E117 | 2. ABS actuator and electric unit (control unit) E125 | 3. Combination meter M24 |
| 4. Rear wheel sensor
LH C11
RH C10 | 5. Yaw rate/side/decel G sensor M108 | 6. Steering angle sensor M17 (view with steering wheel removed) |
| 7. VDC OFF switch M257 | 8. Active booster E49 | 9. Delta stroke sensor E114 |
| 10. Brake fluid level switch E21 | 11. Front pressure sensor E31 | 12. Rear pressure sensor E32 |

Component Description

INFOID:0000000001731223

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-39, "Description"
	Motor	
	Actuator relay	BRC-54, "Description"
	Solenoid valve	BRC-46, "Description"
Wheel sensor		BRC-30, "Description"
ABS warning lamp		BRC-60, "Description"
Brake warning lamp		BRC-61, "Description"

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

< FUNCTION DIAGNOSIS >

[ABS]

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

CONSULT-III Function (ABS)

INFOID:000000001731224

FUNCTION

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

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

SELF-DIAG RESULTS MODE

Operation Procedure

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

How to Erase Self-diagnosis Results

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

CAUTION:

If memory cannot be erased, perform applicable diagnosis.

NOTE:

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

Display Item List

Refer to [BRC-71, "DTC No. Index"](#).

DATA MONITOR MODE

Display Item List

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

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

< FUNCTION DIAGNOSIS >

[ABS]

Item (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
RR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.
N POSI SIG	—	—	×	Shift position judged by PNP switch signal.
P POSI SIG	—	—	×	Shift position judged by PNP switch signal.
ACCEL POS SIG (%)	×	—	×	Throttle valve open/close status judged by CAN communication signal is displayed.
ENGINE SPEED (rpm)	×	×	×	Engine speed judged by CAN communication signal is displayed.
STR ANGLE SIG (deg)	×	—	×	Steering angle detected by steering angle sensor is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor is displayed.
SIDE G-SENSOR (m/s ²)	×	—	×	Transverse acceleration detected by side G-sensor is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
OFF SW (ON/OFF)	×	×	×	VDC OFF switch (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	—	×	×	ABS warning lamp (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	—	×	×	SLIP indicator lamp (ON/OFF) status is displayed.
FR LH IN SOL (ON/OFF)	—	×	×	Front LH IN ABS solenoid (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	—	×	×	Front LH OUT ABS solenoid (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	—	×	×	Rear RH IN ABS solenoid (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	—	×	×	Rear RH OUT ABS solenoid (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	—	×	×	Front RH IN ABS solenoid (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	—	×	×	Front RH OUT ABS solenoid (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	—	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	—	×	×	Rear LH OUT ABS solenoid (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	—	×	×	OFF Lamp (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	—	×	×	ABS motor relay signal (ON/OFF) status is displayed.
ACTUATOR RLY (ON/OFF)	—	×	×	ABS actuator relay signal (ON/OFF) status is displayed.

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

< FUNCTION DIAGNOSIS >

[ABS]

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

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

< FUNCTION DIAGNOSIS >

[ABS]

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

×: Applicable

—: Not applicable

ACTIVE TEST MODE

CAUTION:

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

NOTE:

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

Test Item

SOLENOID VALVE

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

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

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

< FUNCTION DIAGNOSIS >

[ABS]

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

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

ABS MOTOR

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

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

BOOSTER DRIVE

- Touch “UP” and “DOWN” on the screen. Check that booster drive operates as shown in table below.

CAUTION:

Perform active test subject to the conditions below.

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

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

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

[ABS]

< COMPONENT DIAGNOSIS >

COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:0000000001731225

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:0000000001731226

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-30. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731227

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

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

Is the inspection result normal?

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

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

[ABS]

< COMPONENT DIAGNOSIS >

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to [BRC-83, "Removal and Installation"](#).

3.CHECK TIRES

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

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

YES >> GO TO 4

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

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to [FAX-6, "On-Vehicle Inspection and Service"](#) (front) or [RAX-5, "On-Vehicle Inspection and Service"](#) (rear).

Is the inspection result normal?

YES >> GO TO 5

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

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

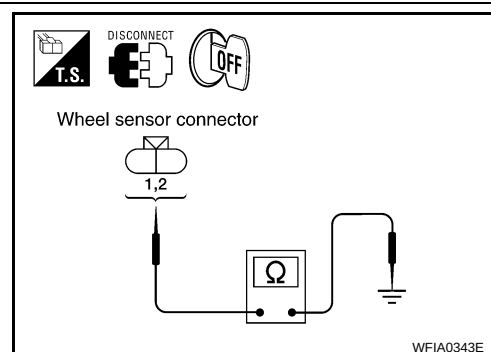
1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
2. Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

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

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-85, "Removal and Installation"](#).

NO >> Repair the circuit.

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

[ABS]

< COMPONENT DIAGNOSIS >

Component Inspection

INFOID:000000001731228

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 ($\pm 10\%$ 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:000000001731229

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[ABS]

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

INFOID:0000000001731230

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:0000000001731231

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-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-33. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731232

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

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

Is the inspection result normal?

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

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[ABS]

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-83. "Removal and Installation"](#).

3. CHECK TIRES

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

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

YES >> GO TO 4

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

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to [FAX-5. "On-Vehicle Inspection and Service"](#) (front) or [RAX-5. "On-Vehicle Inspection and Service"](#) (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to [FAX-7. "Removal and Installation"](#) (front) or [RAX-6. "Removal and Installation"](#) (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

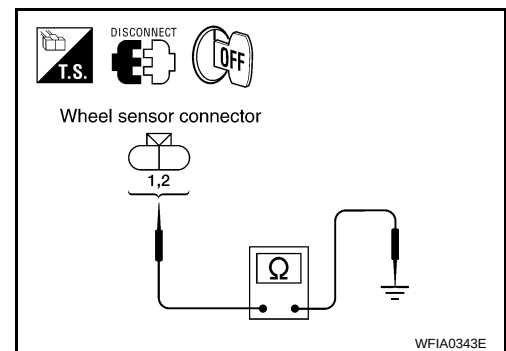
1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
2. Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

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

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[ABS]

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-85, "Removal and Installation"](#).

NO >> Repair the circuit.

Component Inspection

INFOID:0000000001731233

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 ($\pm 10\%$ 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-33, "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:0000000001731234

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[ABS]

C1109 POWER AND GROUND SYSTEM

Description

INFOID:000000001731235

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

DTC Logic

INFOID:000000001731236

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-36, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731237

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
4. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).

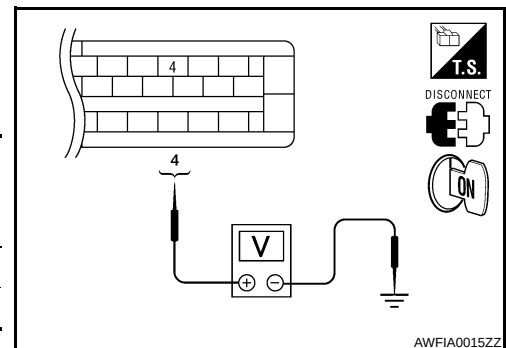
Is any item indicated on the self-diagnosis display?

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

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

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

ABS actuator and electric unit (control unit)		—	Condition	Voltage
Connector	Terminal			
E125	4	Ground	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	Approx. 0V



4. Turn ignition switch OFF.

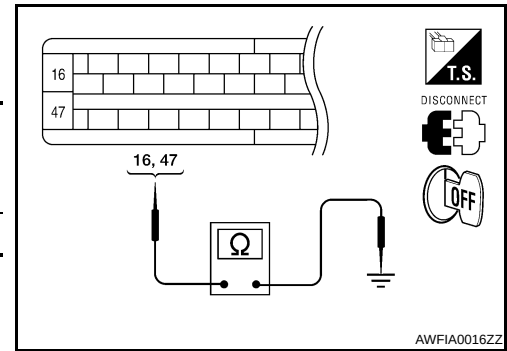
C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[ABS]

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

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



Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000001731238

BRC

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91. "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

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

< COMPONENT DIAGNOSIS >

[ABS]

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

DTC Logic

INFOID:0000000001731239

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE
VARIANT CODING

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to [BRC-38, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731240

INSPECTION PROCEDURE

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

>> Replace ABS actuator and electric unit (control unit). Refer to [BRC-85, "Removal and Installation"](#).

Special Repair Requirement

INFOID:0000000001731241

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[ABS]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description

INFOID:0000000001731242

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:0000000001731243

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-39, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731244

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminal for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminal.
4. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).

Is any item indicated on the self-diagnosis display?

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

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

[ABS]

< COMPONENT DIAGNOSIS >

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

ABS actuator and electric unit (control unit)		—	Voltage
Connector	Terminal		
E125	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

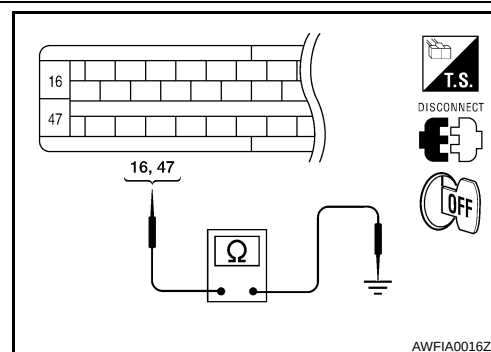
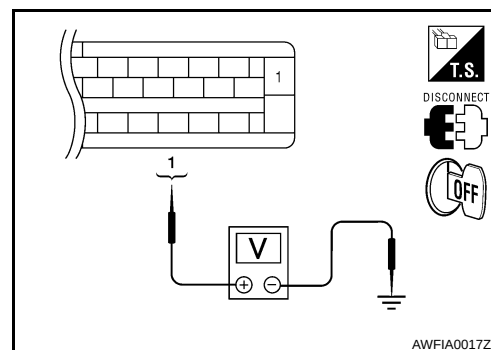
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).
Refer to [BRC-85, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.



Component Inspection

INFOID:0000000001731245

1.CHECK ACTIVE TEST

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

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-39, "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:0000000001731246

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

[ABS]

C1115 WHEEL SENSOR

Description

INFOID:0000000001731252

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:0000000001731253

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-41, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731254

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

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

Is the inspection result normal?

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

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

- YES >> GO TO 3
NO >> Replace the wheel sensor. Refer to [BRC-83, "Removal and Installation"](#).

3.CHECK TIRES

C1115 WHEEL SENSOR

[ABS]

< COMPONENT DIAGNOSIS >

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

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

YES >> GO TO 4

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

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to [FAX-6, "On-Vehicle Inspection and Service"](#) (front) or [RAX-5, "On-Vehicle Inspection and Service"](#) (rear).

Is the inspection result normal?

YES >> GO TO 5

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

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

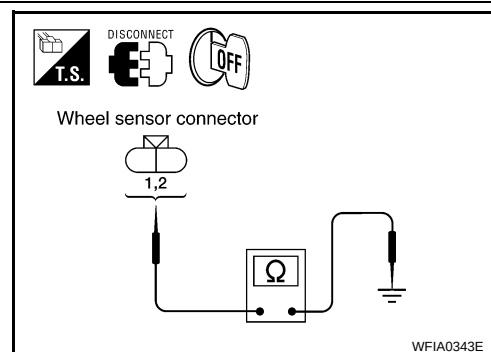
1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
2. Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

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

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-85, "Removal and Installation"](#).

NO >> Repair the circuit.

Component Inspection

INFOID:0000000001731255

1.CHECK DATA MONITOR

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

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

C1115 WHEEL SENSOR

[ABS]

< COMPONENT DIAGNOSIS >

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-41. "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:000000001731256

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91. "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

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BRC

C1116 STOP LAMP SWITCH

< COMPONENT DIAGNOSIS >

[ABS]

C1116 STOP LAMP SWITCH

Description

INFOID:000000001731257

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

DTC Logic

INFOID:000000001731258

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-44. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731259

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

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

2.STOP LAMP SWITCH INSPECTION

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

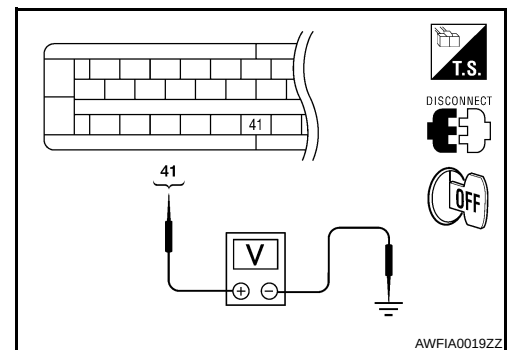
Brake pedal depressed : Battery voltage (approx. 12V)

Brake pedal not depressed : Approx. 0V

Is the inspection result normal?

- YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to [BRC-85. "Removal and Installation"](#).
NO >> GO TO 3

3.STOP LAMP RELAY CIRCUIT INSPECTION



C1116 STOP LAMP SWITCH

[ABS]

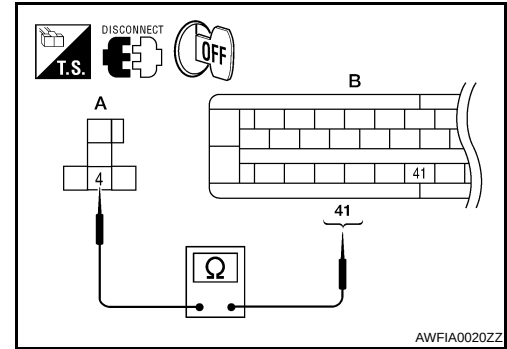
< COMPONENT DIAGNOSIS >

1. Disconnect the stop lamp relay harness connector E12.
2. Check the continuity between the ABS actuator and electric unit (control unit) harness connector E125 (B) terminal 41 and stop lamp relay harness connector E12 (A) terminal 4.

Continuity should exist.

Is the inspection result normal?

- YES >> Refer to [BRC-6, "Work Flow"](#).
NO >> Repair or replace malfunctioning components.



Special Repair Requirement

INFOID:000000001731260

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[ABS]

C1120, C1122, C1124, C1126 IN ABS SOL

Description

INFOID:000000001731261

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:000000001731262

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-46. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731263

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
4. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25. "CONSULT-III Function \(ABS\)"](#).

Is any item indicated on the self-diagnosis display?

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

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

C1120, C1122, C1124, C1126 IN ABS SOL

[ABS]

< COMPONENT DIAGNOSIS >

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

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

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

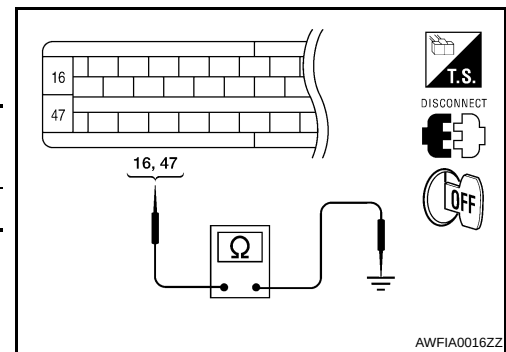
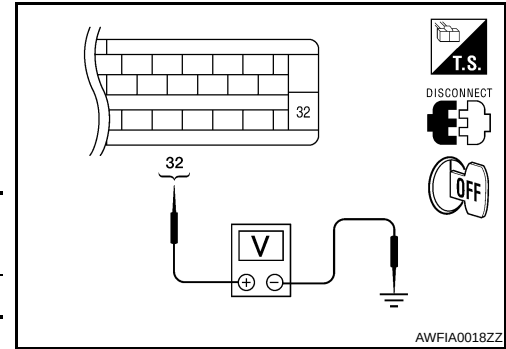
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).
Refer to [BRC-85, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.



Component Inspection

INFOID:000000001731264

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

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

Is the inspection result normal?

YES >> INSPECTION END

< COMPONENT DIAGNOSIS >

NO >> Go to diagnosis procedure. Refer to [BRC-46. "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:0000000001731265

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91. "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[ABS]

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

INFOID:0000000001731266

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:0000000001731267

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-49. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731268

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
4. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25. "CONSULT-III Function \(ABS\)"](#).

Is any item indicated on the self-diagnosis display?

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

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

C1121, C1123, C1125, C1127 OUT ABS SOL

[ABS]

< COMPONENT DIAGNOSIS >

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

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

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

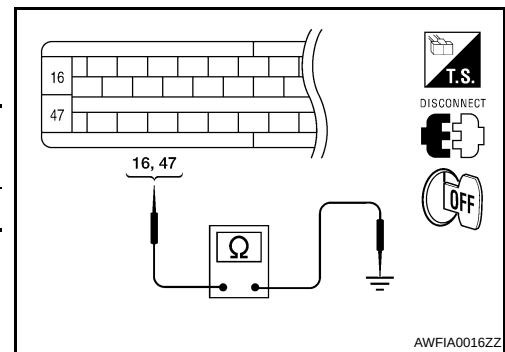
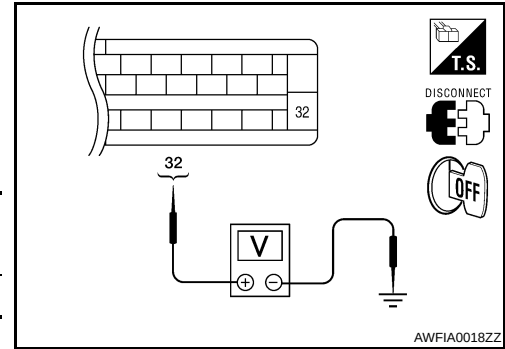
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).
Refer to [BRC-85, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.



Component Inspection

INFOID:000000001731269

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

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-49, "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:000000001731270

1.AJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

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BRC

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[ABS]

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description

INFOID:0000000001731271

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

DTC Logic

INFOID:0000000001731272

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine fuel cut system is malfunctioning.	• 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-52, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731273

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-107, "CONSULT-III Function"](#) (HR16DE with EURO-OBD)
 - [EC-462, "CONSULT-III Function"](#) (HR16DE without EURO-OBD)
 - [EC-772, "CONSULT-III Function"](#) (MR18DE)
 - [EC-1104, "Diagnosis Description"](#) (K9K)
2. Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace the affected part.

NO >> INSPECTION END

Special Repair Requirement

INFOID:0000000001731274

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[ABS]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

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BRC

C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

[ABS]

C1140 ACTUATOR RLY

Description

INFOID:000000001731275

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

DTC Logic

INFOID:000000001731276

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ACTUATOR RLY

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-54, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731277

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
4. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).

Is any item indicated on the self-diagnosis display?

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

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

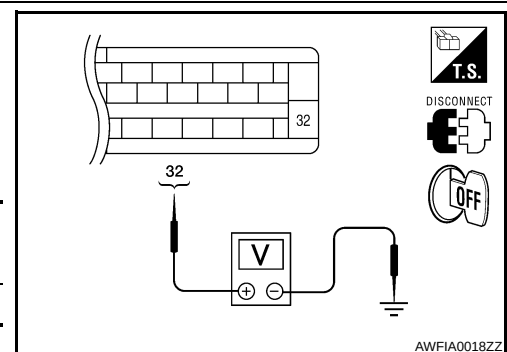
1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

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

Is the inspection result normal?

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

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



C1140 ACTUATOR RLY

[ABS]

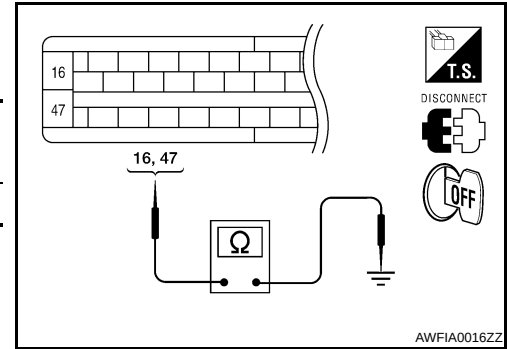
< COMPONENT DIAGNOSIS >

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

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
Refer to [BRC-85, "Removal and Installation"](#).
- NO >> Repair or replace malfunctioning components.



Component Inspection

INFOID:000000001731278

1.CHECK ACTIVE TEST

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

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Go to diagnosis procedure. Refer to [BRC-54, "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:000000001731279

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

[ABS]

C1155 BRAKE FLUID LEVEL SWITCH

Description

INFOID:0000000001731290

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:0000000001731291

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BR FLUID LEVEL LOW

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-56. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731292

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

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

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

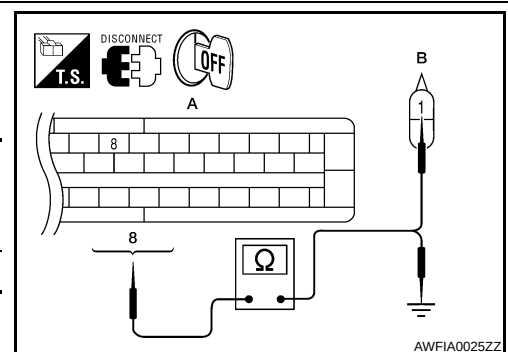
1. Check continuity between ABS actuator and electric unit (control unit) harness connector E125 (A) and brake fluid level switch harness connector E21 (B).

ABS actuator and electric unit (control unit)		Brake fluid level switch		Continuity
Connector	Terminal	Connector	Terminal	
A: E125	8	B: E21	1	Yes

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

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

Is the inspection result normal?



C1155 BRAKE FLUID LEVEL SWITCH

[ABS]

< COMPONENT DIAGNOSIS >

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

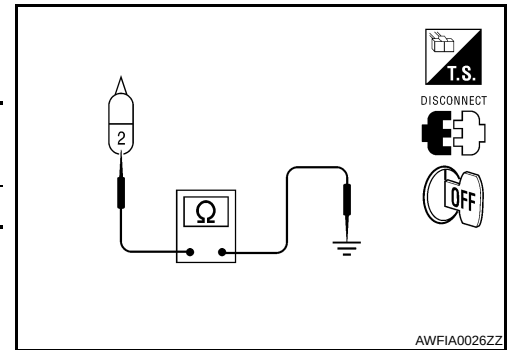
3.CHECK BRAKE FLUID LEVEL SWITCH GROUND

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

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

Is the inspection result normal?

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



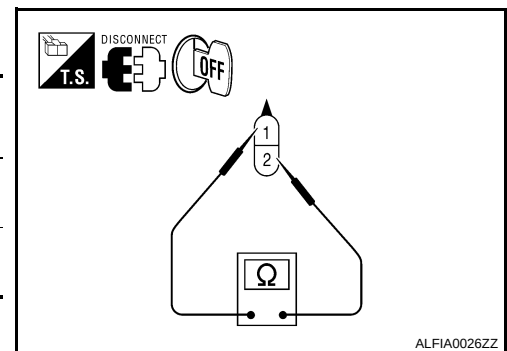
4.CHECK BRAKE FLUID LEVEL SWITCH

Check continuity between brake fluid level switch terminals.

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

Is the inspection result normal?

- YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to [BRC-85, "Removal and Installation"](#).
NO >> Replace brake fluid level switch.



Component Inspection

INFOID:000000001731293

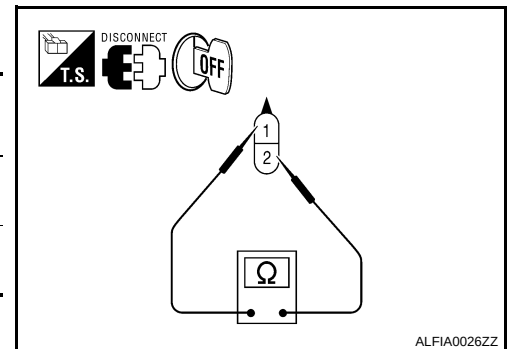
1.CHECK BRAKE FLUID LEVEL SWITCH

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

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

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace brake fluid level switch.



Special Repair Requirement

INFOID:000000001731294

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

[ABS]

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit).
Refer to [BRC-91. "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

U1000 CAN COMM CIRCUIT

Description

INFOID:000000001731319

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:000000001731320

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)

BRC

Diagnosis Procedure

INFOID:000000001731321

INSPECTION PROCEDURE

1.CHECK CONNECTOR

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

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

- YES >> Print out the self-diagnostic results, and refer to [LAN-22, "Trouble Diagnosis Flow Chart"](#).
 NO >> Connector terminal is loose, damaged, open, or shorted.

Special Repair Requirement

INFOID:000000001731322

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

ABS WARNING LAMP

< COMPONENT DIAGNOSIS >

[ABS]

ABS WARNING LAMP

Description

INFOID:0000000001731327

×: ON –: OFF

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

Component Function Check

INFOID:0000000001731328

1.CHECK ABS WARNING LAMP OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-60, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000001731329

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to [BRC-25, "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-21, "Diagnosis Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-85, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-94, "Removal and Installation"](#).

BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

[ABS]

BRAKE WARNING LAMP

Description

INFOID:0000000001731330

×: ON –: OFF

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

NOTE:

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

Component Function Check

INFOID:0000000001731331

BRC

1. BRAKE WARNING LAMP OPERATION CHECK

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-61, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000001731332

1. CHECK SELF-DIAGNOSIS

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

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to [MWI-21, "Diagnosis Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-85, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-94, "Removal and Installation"](#).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ABS]

ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000001731339

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

CONSULT-III MONITOR ITEM

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FR LH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
FR RH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
RR LH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
RR RH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is depressed	ON
		When brake pedal is released	OFF
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON
		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G sensor	When vehicle is stopped	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 %
		Accelerator pedal depressed (ignition switch is ON)	0 - 100 %

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ABS]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
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 front 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 SPEED	With engine running	With engine stopped	0 rpm
		Engine running	Almost in accordance with tachometer display
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch ON	ON
		When brake fluid level switch OFF	OFF
FR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ABS]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
RR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	ON
		When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp (Note 3)	When ABS warning lamp is ON	ON
		When ABS warning lamp is OFF	OFF
OFF LAMP	VDC OFF indicator lamp (Note 3)	When VDC OFF indicator lamp is ON	ON
		When VDC OFF indicator lamp is OFF	OFF
SLIP LAMP	SLIP indicator lamp (Note 3)	When SLIP indicator lamp is ON	ON
		When SLIP indicator lamp is OFF	OFF
4WD FAIL REQ (Note 2)	Transfer control unit fail-safe signal	When transfer control unit is in fail-safe mode	ON
		When transfer control unit is normal	OFF
BST OPER SIG	Not applied but displayed	—	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

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ABS]

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
CV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
CV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
DECEL G-SEN	Longitudinal acceleration detected by Decel G-Sensor	Vehicle stopped	Approx. 0 G
		Vehicle running	-1.7 to 1.7 G
EBD WARN LAMP	EBD warning lamp (Note 3)	When EBD warning lamp is ON	ON
		When EBD warning lamp is OFF	OFF
N POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = N position	ON
		A/T shift position = other than N position	OFF
P POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = P position	ON
		A/T shift position = other than P position	OFF
R POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = R position	ON
		A/T shift position = other than R position	OFF
2WD/4WD	Drive axle	2WD model	2WD
		4WD model	4WD
PRESS SEN2	Brake fluid pressure detected by rear pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar
		With ignition switch turned ON and brake pedal depressed	-40 to 300 bar

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

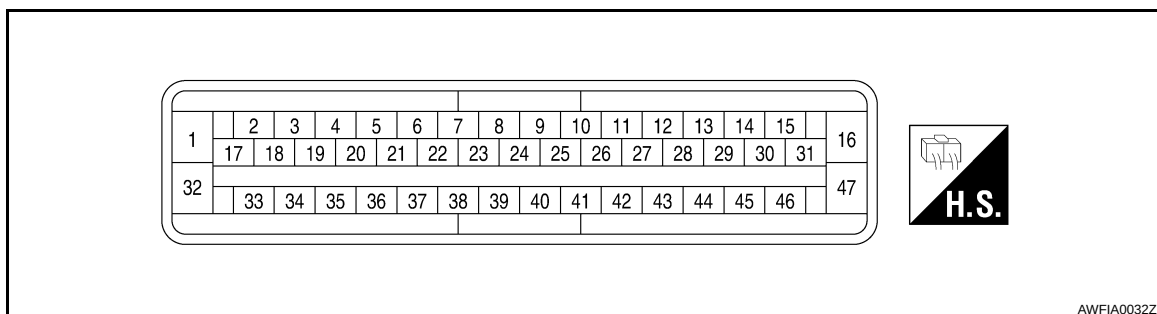
[ABS]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
DELTA S SEN	Value detected by delta stroke sensor	When brake pedal is depressed	1.05 - 1.80 mm
		When brake pedal is released	0.00 mm (+0.6/-0.4)
RELEASE SWITCH NO	Active booster signal status	When brake pedal is depressed	ON
		When brake pedal is released	OFF
RELEASE SWITCH NC	Active booster signal status	When brake pedal is depressed	OFF
		When brake pedal is released	ON

NOTE:

- 1: Confirm tire pressure is normal.
- 2: Only 4WD models.
- 3: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to [BRC-60, "Description"](#).
- Brake warning lamp: Refer to [BRC-61, "Description"](#).
- VDC OFF indicator lamp: Refer to [XX-XX, "*****"](#).
- SLIP indicator lamp: Refer to [XX-XX, "*****"](#).

TERMINAL LAYOUT



ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ABS]

Wiring Diagram - LHD

INFOID:0000000001731340

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ABS]

**NO
DATA**

ALFWA0019GB

NO
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ALFWA0020GB

Fail-Safe

INFOID:000000001731341

CAUTION:

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

ABS/EBD SYSTEM

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[ABS]

< ECU DIAGNOSIS >

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

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

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

VDC/TCS SYSTEM

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

DTC No. Index

INFOID:000000001731342

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	BRC-30, "Description"
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	BRC-33, "Description"
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-36, "Description"
C1110	CONTROLLER FAILURE	BRC-38, "DTC Logic"
C1111	PUMP MOTOR	BRC-39, "Description"
C1113	G-SENSOR	XX-XX, "*****"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-41, "Description"
C1116	STOP LAMP SW	BRC-44, "Description"
C1120	FR LH IN ABS SOL	BRC-46, "Description"
C1121	FR LH OUT ABS SOL	BRC-49, "Description"
C1122	FR RH IN ABS SOL	BRC-46, "Description"
C1123	FR RH OUT ABS SOL	BRC-49, "Description"
C1124	RR LH IN ABS SOL	BRC-46, "Description"
C1125	RR LH OUT ABS SOL	BRC-49, "Description"
C1126	RR RH IN ABS SOL	BRC-46, "Description"
C1127	RR RH OUT ABS SOL	BRC-49, "Description"
C1130	ENGINE SIGNAL 1	BRC-52, "Description"
C1131	ENGINE SIGNAL 2	
C1132	ENGINE SIGNAL 3	
C1133	ENGINE SIGNAL 4	
C1136	ENGINE SIGNAL 6	
C1140	ACTUATOR RLY	BRC-54, "Description"
C1142	PRESS SEN CIRCUIT	XX-XX, "*****"
C1143	ST ANG SEN CIRCUIT	XX-XX, "*****"
C1144	ST ANG SEN SIGNAL	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ABS]

DTC	Items (CONSULT screen terms)	Reference
C1145	YAW RATE SENSOR	<u>XX-XX, *****</u>
C1146	SIDE G-SEN CIRCUIT	
C1155	BR FLUID LEVEL LOW	<u>BRC-56, "Description"</u>
C1156	ST ANG SEN COM CIR	<u>XX-XX, *****</u>
C1160	DECEL G SEN SET	<u>XX-XX, *****</u>
C1163	ST ANGL SEN SAFE	<u>XX-XX, *****</u>
C1164	CV1	<u>XX-XX, *****</u>
C1165	CV2	
C1166	SV1	
C1167	SV2	
C1170	VARIANT CORDING	<u>BRC-38, "DTC Logic"</u>
C1178	ABS ACTIVE BOOSTER SV NG	<u>XX-XX, *****</u>
C1179	ABS DELTA S SEN NG	<u>XX-XX, *****</u>
C1181	ABS ACTIVE BOOSTER RESPONSE NG	<u>XX-XX, *****</u>
C1184	ABS BRAKE RELEASE SW NG	
C1189	ABS BRAKE BOOSTER DEFECT	
U1000	CAN COMM CIRCUIT	<u>BRC-59, "Description"</u>

SYMPTOM DIAGNOSIS

ABS

Symptom Table

INFOID:000000001731343

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-74, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-75, "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-76, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-77, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-78, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	

NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal.
 - When shifting gears
 - When driving on slippery road
 - During cornering at high speed
 - When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]
 - When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[ABS]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:000000001731344

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. "On-Vehicle Inspection and Service"](#), Rear: [RAX-5. "On-Vehicle Inspection and 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-83. "Removal and Installation"](#).
• Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

Is the ABS warning lamp illuminated?

YES >> Perform self-diagnosis. Refer to [BRC-25. "CONSULT-III Function \(ABS\)"](#).

NO >> Normal

UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS >

[ABS]

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:000000001731345

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to [BR-6, "Inspection and Adjustment"](#).

Is the stroke too large?

- YES >> • Bleed air from brake tube and hose. Refer to [BR-8, "Bleeding Brake System"](#).
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to [BR-18, "On-Board Inspection"](#) (master cylinder), [BR-19, "On Board Inspection"](#) (brake booster).
- NO >> GO TO 2

2.CHECK FUNCTION

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

Is the inspection result normal?

- YES >> Normal
- NO >> Check brake system.

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THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[ABS]

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000001731346

CAUTION:

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

1.CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[ABS]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000001731347

CAUTION:

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

1. CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> Normal

NO >> Perform self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)".](#)

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PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[ABS]

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:000000001731348

CAUTION:

Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal.

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

1. SYMPTOM CHECK 1

Check that there are pedal vibrations when the engine is started.

Do vibrations occur?

YES >> GO TO 2

NO >> Inspect the brake pedal.

2. SYMPTOM CHECK 2

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

Do the operation noises occur?

YES >> GO TO 3

NO >> Perform self -diagnosis. Refer to [BRC-25. "CONSULT-III Function \(ABS\)".](#)

3. SYMPTOM CHECK 3

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

Do symptoms occur?

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

NO >> Normal

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[ABS]

NORMAL OPERATING CONDITION

Description

INFOID:000000001731350

Symptom	Result
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.	This is a normal condition due to the VDC, TCS or ABS activation.
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.	
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because TCS places the highest priority on the optimum traction (stability).
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	
The ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.	In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. At that time, erase the self-diagnosis memory.
VDC may not operate normally or the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp may illuminate, when running on a special road that is extremely slanted (e.g. bank in a circuit course).	
A malfunction may occur in the yaw rate/side/decel G sensor system, when the vehicle turns sharply, such as during a spin turn, axle turn, or drift driving, while the VDC function is off (VDC OFF indicator lamp illuminated).	
The vehicle speed will not increase even though the accelerator pedal is depressed, when inspecting the speedometer on a 2-wheel chassis dynamometer.	Normal (Deactivate the VDC/TCS function before performing an inspection on a chassis dynamometer.)
VDC OFF indicator lamp and SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a VDC system error but results from characteristic change of tire.

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PRECAUTION

PRECAUTIONS

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

INFOID:000000001691368

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. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

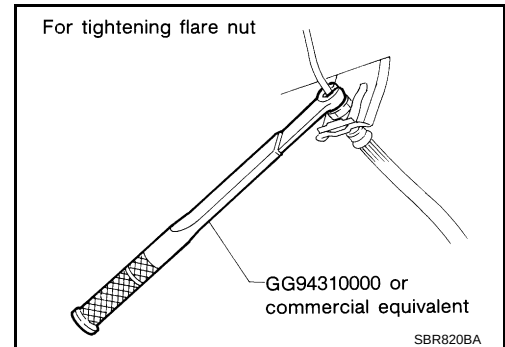
WARNING:

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

Precaution for Brake System

INFOID:000000001691369

- Recommended fluid is Genuine NISSAN Fluid, DOT 3 or DOT 4 (US FMVSS No. 116).
- Do not reuse the drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Do not use mineral oils such as gasoline or kerosene to clean. They will ruin rubber parts and cause improper operation.
- Using a flare nut torque wrench, securely tighten brake tube flare nuts.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble malfunctioning parts. If any malfunctioning part is found, replace the part with a new one.
- Before working, turn ignition switch OFF and disconnect connectors for ABS actuator and electric unit or battery terminals.
- When installing brake piping, be sure to check tightening torque.



Precaution for Brake Control

INFOID:000000001691370

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- When starting engine, or just after starting vehicle, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from the customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides the electrical system inspection, check booster operation, brake fluid level, and oil leaks.
- If tyre size and type are used in an improper combination, or brake pads are not Genuine Nissan parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near the control unit, ABS system may malfunction or return an error.
- If aftermarket parts (e.g. car stereo equipment, CD player) have been installed, check electrical harnesses for pinches, open, and improper wiring.

PRECAUTIONS

< PRECAUTION >

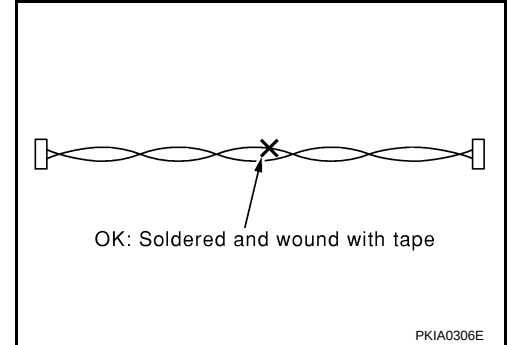
[ABS]

Precaution for Harness Repair

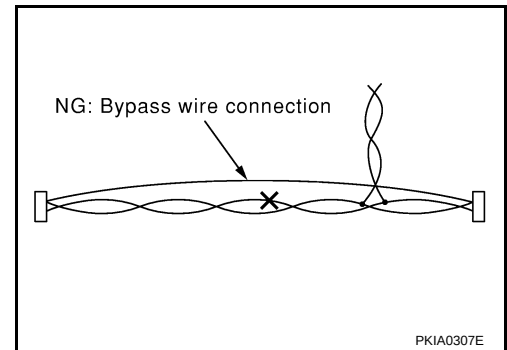
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CAN SYSTEM

- Area to be repaired shall be soldered, and wrapped with a tape (be sure that fraying of twisted wire shall be within 110 mm 4.33 in)).



- Do not make a bypass connection to repaired area. (If it is done, branch part will be removed and characteristics of twisted wire will be lost.)



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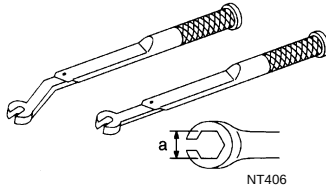
PREPARATION

PREPARATION

Special Service Tool

INFOID:000000001691372

Tool number Tool name	Description
GG94310000 Flare nut torque wrench a: 10 mm (0.39 in)	Removing and installing each brake piping



WHEEL SENSORS

< REMOVAL AND INSTALLATION >

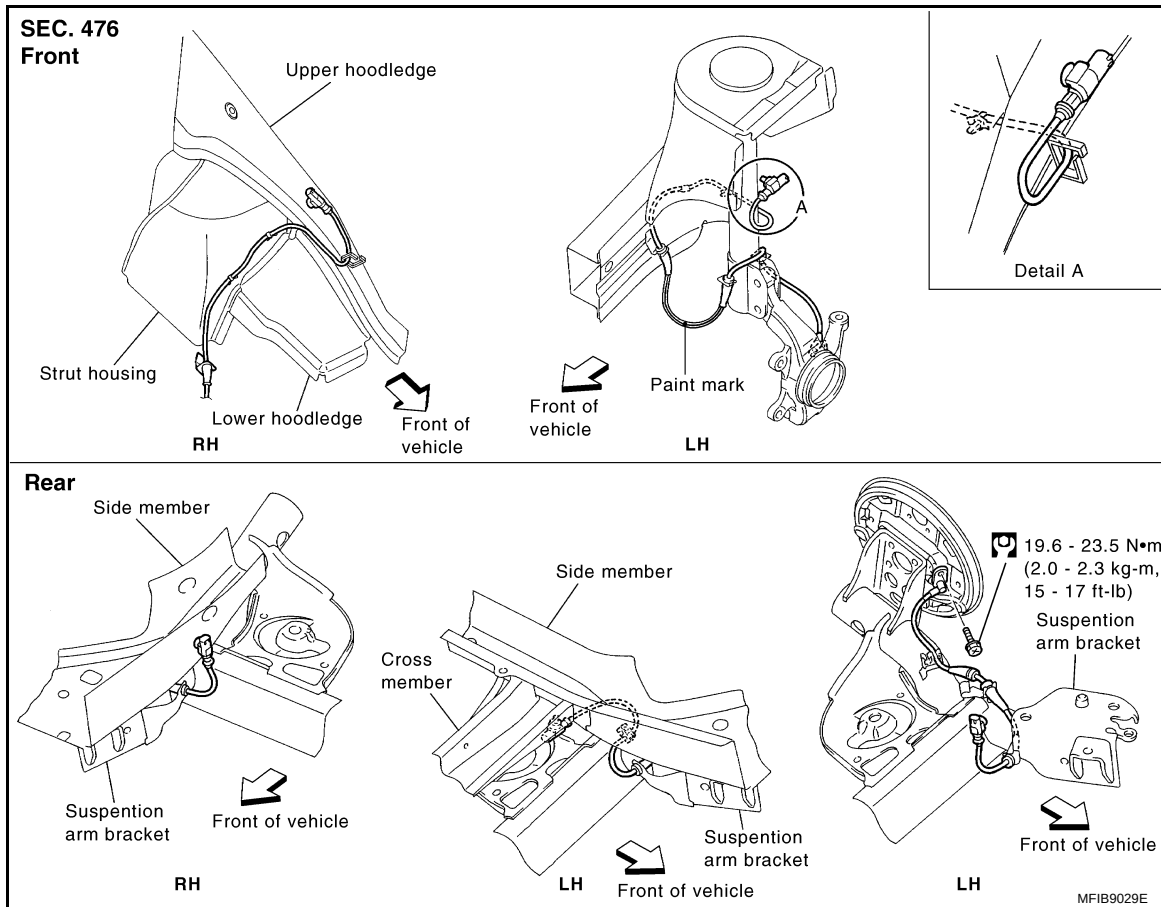
[ABS]

REMOVAL AND INSTALLATION

WHEEL SENSORS

Removal and Installation

INFOID:000000001691408



REMOVAL

Be careful of the following.

CAUTION:

- When removing the sensor, do not rotate it if possible, and not forcibly pull the sensor harness.
- Before removing front or rear wheel hub, remove wheel sensor to avoid sensor wiring damage.

INSTALLATION

Be certain to tighten bolts to the specified torque. Be careful of the following:

- Check the inside of the sensor mounting hole for foreign material, the rotor surface for iron chips and other foreign material, and if anything is non-standard, clean it before installation, or replace it.
- When installing the front sensor, completely push in the strut bracket and body bracket rubber grommets until they lock so that the sensor harness does not become twisted. In addition, there should be no twists in the harness when installed. Install the harness so that the painted part faces the outside of the vehicle.
- When installing the rear sensor, completely push in the rubber bracket of the suspension arm bracket and lock the marking area of the side member harness mount so that the sensor harness will not be twisted. In addition, there should be no twists in the harness when installed.

SENSOR ROTOR

Removal and Installation

INFOID:0000000001691409

FRONT

- Because the sensor rotor is integrated with the wheel bearing, replace it together with the wheel bearing assembly. Refer to [FAX-7, "Removal and Installation"](#).

REAR

- During removal and installation, remove the wheel hub (brake drum). Refer to [RAX-6, "Removal and Installation"](#).

CAUTION:

The sensor rotor is a non-reusable part, it must be replaced by an new part when removing it.

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

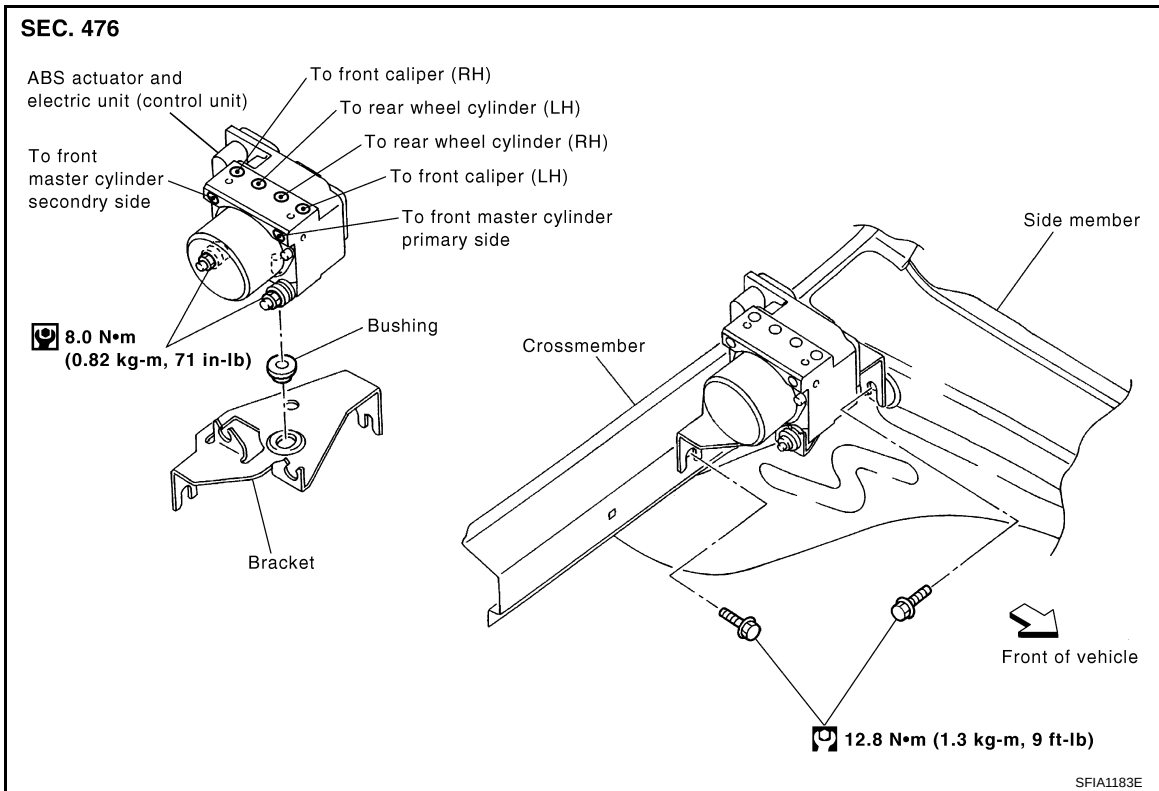
< REMOVAL AND INSTALLATION >

[ABS]

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation

INFOID:000000001691410



REMOVAL

Be careful of the following.

CAUTION:

- Before servicing, disconnect the battery cables.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use a flare nut torque wrench and tighten to the specified torque.
- Do not apply excessive impact to the actuator, such as dropping it.

INSTALLATION

Be careful of the following.

- When setting the actuator in the bracket, push it in until it locks.
- Tighten the mounting bolts and nuts to the specified torque.
- After the work, bleed the air from the brake piping. Refer to [BR-8, "Bleeding Brake System"](#).
- After installing the vehicle harness connector in the actuator, make sure the connector is securely locked.

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001731359

PRECAUTIONS FOR DIAGNOSIS

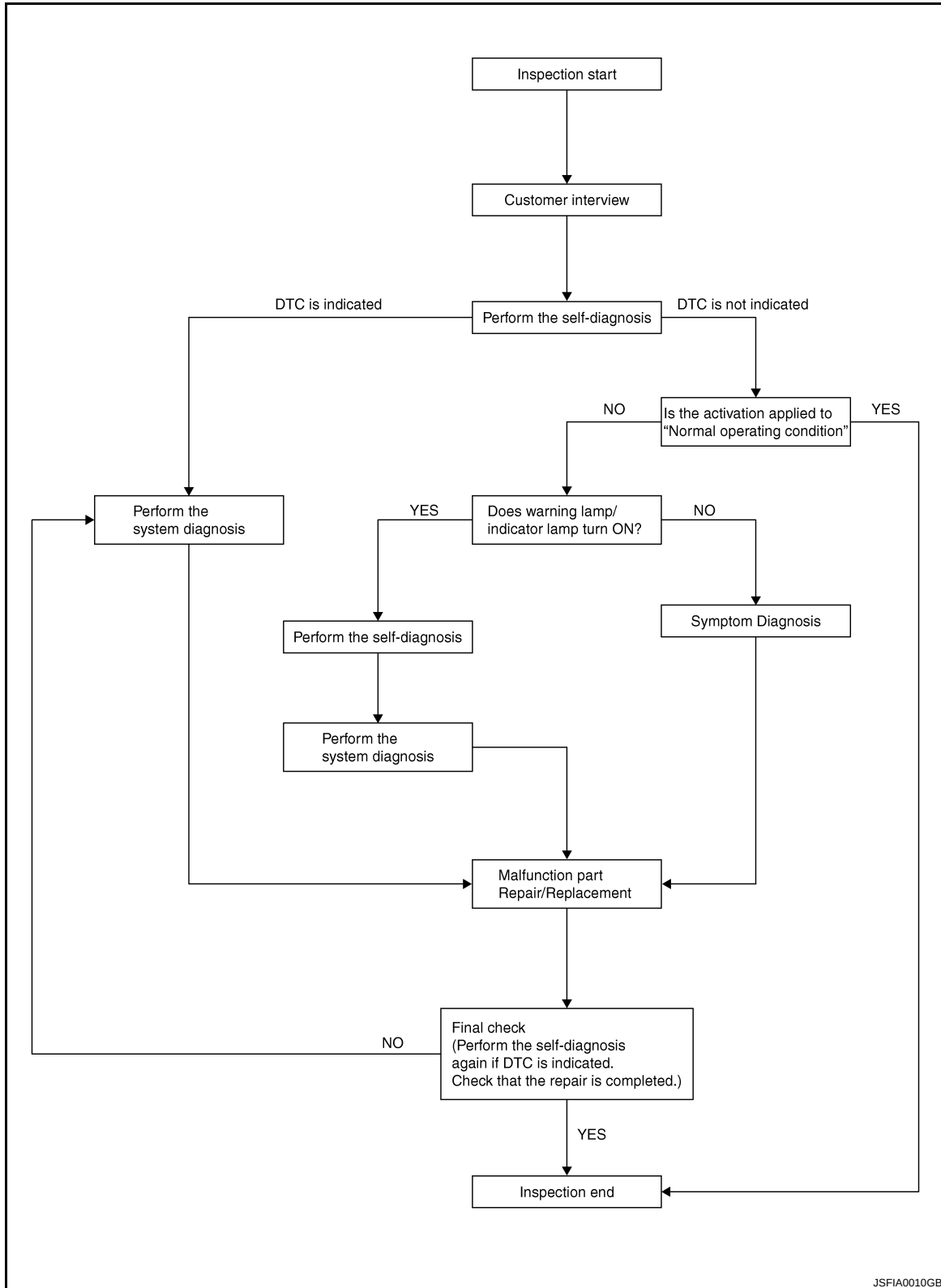
If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[ESP/TCS/ABS]

OVERALL SEQUENCE



DETAILED FLOW

1.COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to [BRC-89, "Diagnostic Work Sheet"](#).

>> GO TO 2

< BASIC INSPECTION >

2.PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function. Refer to [BRC-25, "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-71, "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-79, "Description"](#).

Is the symptom a normal operation?

YES >> INSPECTION END

NO >> GO TO 5

5.CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.

- ABS warning lamp: Refer to [BRC-60, "Description"](#).
- Brake warning lamp: Refer to [BRC-61, "Description"](#).
- VDC OFF indicator lamp: Refer to [XX-XX, "*****"](#).
- SLIP indicator lamp: Refer to [XX-XX, "*****"](#).

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-25, "CONSULT-III Function \(ABS\)"](#).

Is no other DTC present and the repair completed?

YES >> INSPECTION END

NO >> GO TO 3

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[ESP/TCS/ABS]

Diagnostic Work Sheet

INFOID:000000001731360

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

SFIA3265E

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BRC

INSPECTION AND ADJUSTMENT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

INFOID:000000001731361

After replacing the ABS actuator and electric unit (control unit), perform the following procedures:

- Neutral position adjustment for the steering angle sensor
- Calibration of the decel G sensor

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement

INFOID:000000001731362

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#), GO TO 2

2.PERFORM CALIBRATION OF THE DECEL G SENSOR

Perform calibration of the decel G sensor.

>> Refer to [BRC-92, "CALIBRATION OF DECEL G SENSOR : Special Repair Requirement"](#).

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:000000001731363

Refer to the table below to determine if adjustment of steering angle sensor neutral position is required.

x: 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)	x
Removing/Installing steering angle sensor	x
Replacing steering angle sensor	x
Removing/Installing steering components	x
Replacing steering components	x
Removing/Installing suspension components	x
Replacing suspension components	x
Change tires to new ones	—
Tire rotation	—
Adjusting wheel alignment	x

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement

INFOID:000000001731364

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.

< BASIC INSPECTION >

>> GO TO 2

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

1. On the CONSULT-III screen, touch "WORK SUPPORT" and "ST ANG SEN ADJUSTMENT" in order.
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, it ends automatically.

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

CAUTION:**Be sure to perform above operation.**

>> GO TO 3

3. CHECK DATA MONITOR

1. Run vehicle with front wheels in straight-ahead position, then stop.
2. Select "DATA MONITOR". Then make sure "STR ANGLE SIG" is within $0 \pm 2.5^\circ$.

Is the steering angle within the specified range?

YES >> GO TO 4

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

4. ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).
- ECM, refer to:
 - [EC-107, "CONSULT-III Function"](#) (HR16DE with EURO-OBD)
 - [EC-462, "CONSULT-III Function"](#) (HR16DE without EURO-OBD)
 - [EC-772, "CONSULT-III Function"](#) (MR18DE)
 - [EC-1104, "Diagnosis Description"](#) (K9K)

Are the memories erased?

YES >> INSPECTION END

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

CALIBRATION OF DECEL G SENSOR**CALIBRATION OF DECEL G SENSOR : Description**

INFOID:000000001731365

Refer to the table below to determine if calibration of the decel G sensor is required.

x: Required –: Not required

Situation	Calibration of decel G sensor
Removing/Installing ABS actuator and electric unit (control unit)	—
Replacing ABS actuator and electric unit (control unit)	x
Removing/Installing steering angle sensor	x
Replacing steering angle sensor	x
Removing/Installing steering components	x
Replacing steering components	x
Removing/Installing suspension components	x
Replacing suspension components	x
Change tires to new ones	—
Tire rotation	—
Adjusting wheel alignment	x

CALIBRATION OF DECEL G SENSOR : Special Repair Requirement

INFOID:000000001731366

CALIBRATION OF DECEL G SENSOR

CAUTION:

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

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2

2. PERFORM CALIBRATION OF DECEL G SENSOR

-
1. On the CONSULT-III screen, touch "WORK SUPPORT" and "DECEL G SEN CALIBRATION" in order.
 2. Touch "START".
 3. After approximately 10 seconds, touch "END".

NOTE:

After approximately 60 seconds, it ends automatically.

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

CAUTION:

Be sure to perform above operation.

>> GO TO 3

3. CHECK DATA MONITOR

-
1. Run vehicle with front wheels in straight-ahead position, then stop.
 2. Select "DATA MONITOR". Then make sure "DECEL G SEN" is within $\pm$.

Is the inspection result normal?

YES >> GO TO 4

NO >> Perform calibration of decel G sensor again, GO TO 1

4. ERASE THE SELF-DIAGNOSIS MEMORY

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

- ABS actuator and electric unit (control unit): Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).
- ECM, refer to:
 - [EC-107, "CONSULT-III Function"](#) (HR16DE with EURO-OBD)
 - [EC-462, "CONSULT-III Function"](#) (HR16DE without EURO-OBD)
 - [EC-772, "CONSULT-III Function"](#) (MR18DE)
 - [EC-1104, "Diagnosis Description"](#) (K9K)

Are the memories erased?

YES >> INSPECTION END

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

System Diagram

Diagram illustrating the ABS system wiring for a vehicle with 4WD. The system components and their connections are as follows:

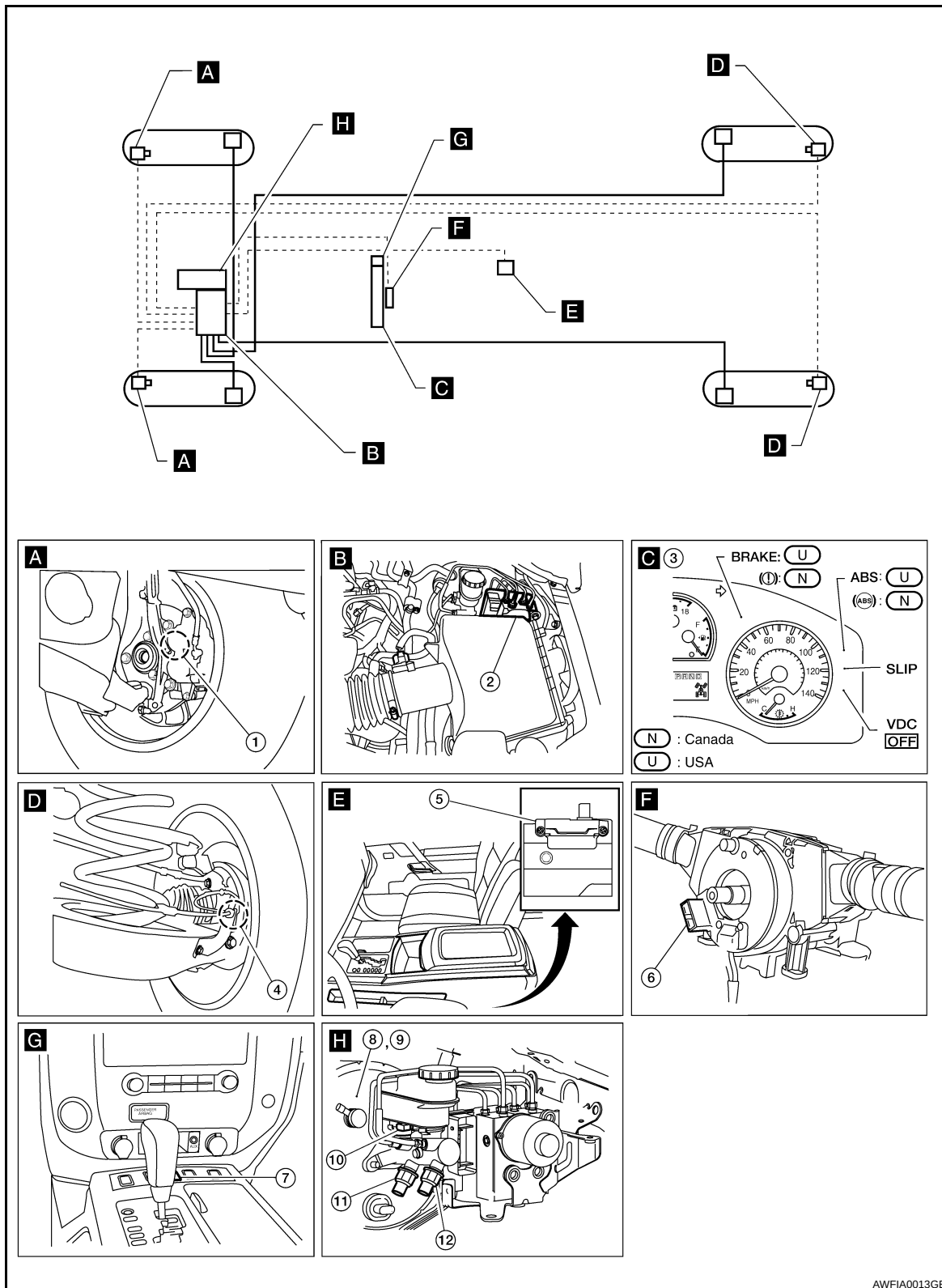
- ECM (Engine Control Module)**: Connected to the CAN communication line and provides the injector operation signal to the injector solenoid.
- TCM (Transmission Control Module)**: Connected to the CAN communication line.
- Steering angle sensor**: Connected to the CAN communication line.
- Transfer control unit (With 4WD)**: Connected to the CAN communication line.
- Combination meter**: Connected to the CAN communication line.
- Front wheel sensor RH**: Connected to the ABS actuator and electric unit (control unit).
- Front wheel sensor LH**: Connected to the ABS actuator and electric unit (control unit).
- Rear wheel sensor LH**: Connected to the ABS actuator and electric unit (control unit).
- Rear wheel sensor RH**: Connected to the ABS actuator and electric unit (control unit).
- ABS actuator and electric unit (control unit)**: Receives signals from the wheel sensors and controls the Front pressure sensor, Rear pressure sensor, Active booster, Delta stroke sensor, Yaw rate/side/decel G sensor, and VDC OFF switch.
- Front pressure sensor**: Connected to the ABS actuator and electric unit (control unit).
- Rear pressure sensor**: Connected to the ABS actuator and electric unit (control unit).
- Active booster**: Connected to the ABS actuator and electric unit (control unit).
- Delta stroke sensor**: Connected to the ABS actuator and electric unit (control unit).
- Yaw rate/side/decel G sensor**: Connected to the ABS actuator and electric unit (control unit).
- VDC OFF switch**: Connected to the ABS actuator and electric unit (control unit).

AWFIA0012G

System Description

INFOID:0000000001731066

- Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from steering angle sensor and pressure sensors. Using information from yaw rate/side/decel G sensor and wheel sensor, VDC judges driving condition (conditions of under steer and over steer) to improve vehicle driving stability by controlling brake application to 4 wheels and engine output.
- During VDC operation, it informs driver of system operation by flashing SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.



- | | | | |
|--|---|---|---|
| 1. Front wheel sensor
LH E18
RH E117 | 2. ABS actuator and electric unit (control unit) E125 | 3. Combination meter M24 | A |
| 4. Rear wheel sensor
LH C11
RH C10 | 5. Yaw rate/side/decel G sensor M108 | 6. Steering angle sensor M17 (view with steering wheel removed) | B |
| 7. VDC OFF switch M257 | 8. Active booster E49 | 9. Delta stroke sensor E114 | C |
| 10. Brake fluid level switch E21 | 11. Front pressure sensor E31 | 12. Rear pressure sensor E32 | |

Component Description

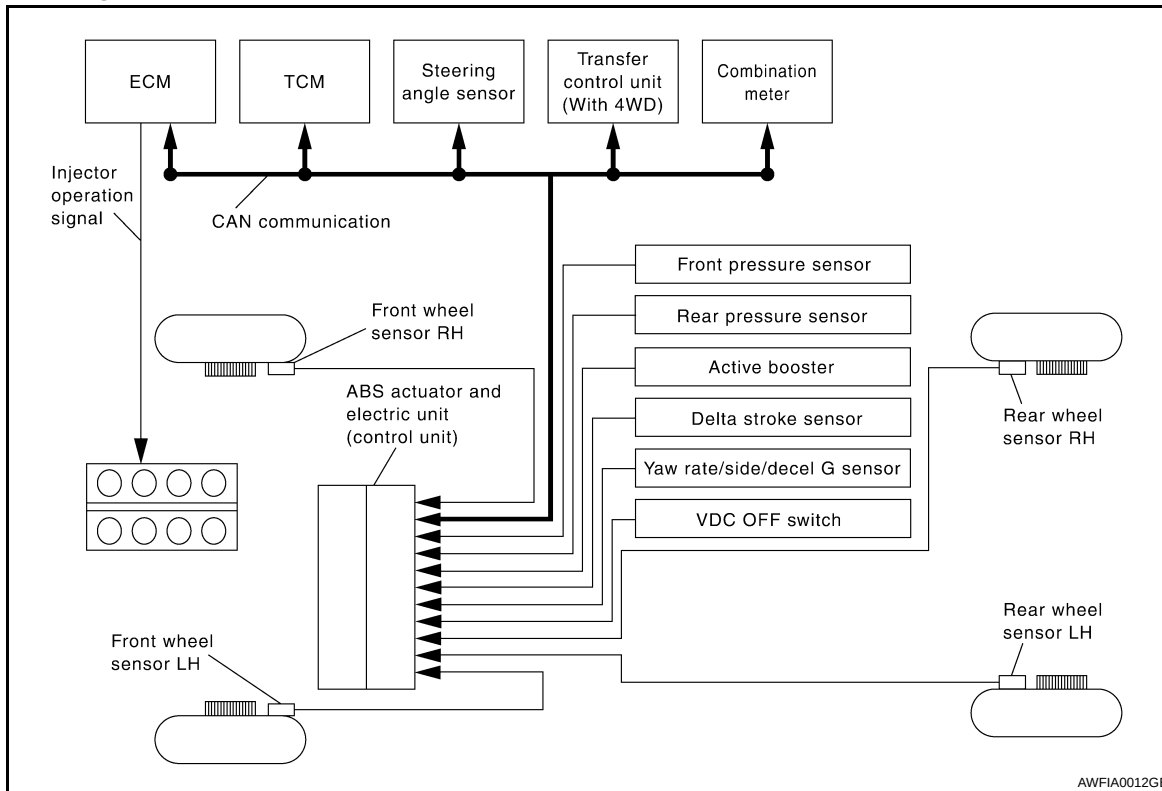
INFOID:000000001731068

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-39, "Description"
	Motor	
	Actuator relay	BRC-54, "Description"
	Solenoid valve	BRC-46, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	XX-XX, "*****"
Wheel sensor		BRC-30, "Description"
Yaw rate/side/decel G sensor		XX-XX, "*****"
Steering angle sensor		XX-XX, "*****"
VDC OFF switch		XX-XX, "*****"
ABS warning lamp		BRC-60, "Description"
Brake warning lamp		BRC-61, "Description"
VDC OFF indicator lamp		XX-XX, "*****"
SLIP indicator lamp		XX-XX, "*****"
Front pressure sensor		XX-XX, "*****"
Rear pressure sensor		
Active booster		XX-XX, "*****"
Delta stroke sensor		XX-XX, "*****"

TCS

System Diagram

INFOID:000000001731069



AWFIA0012GE

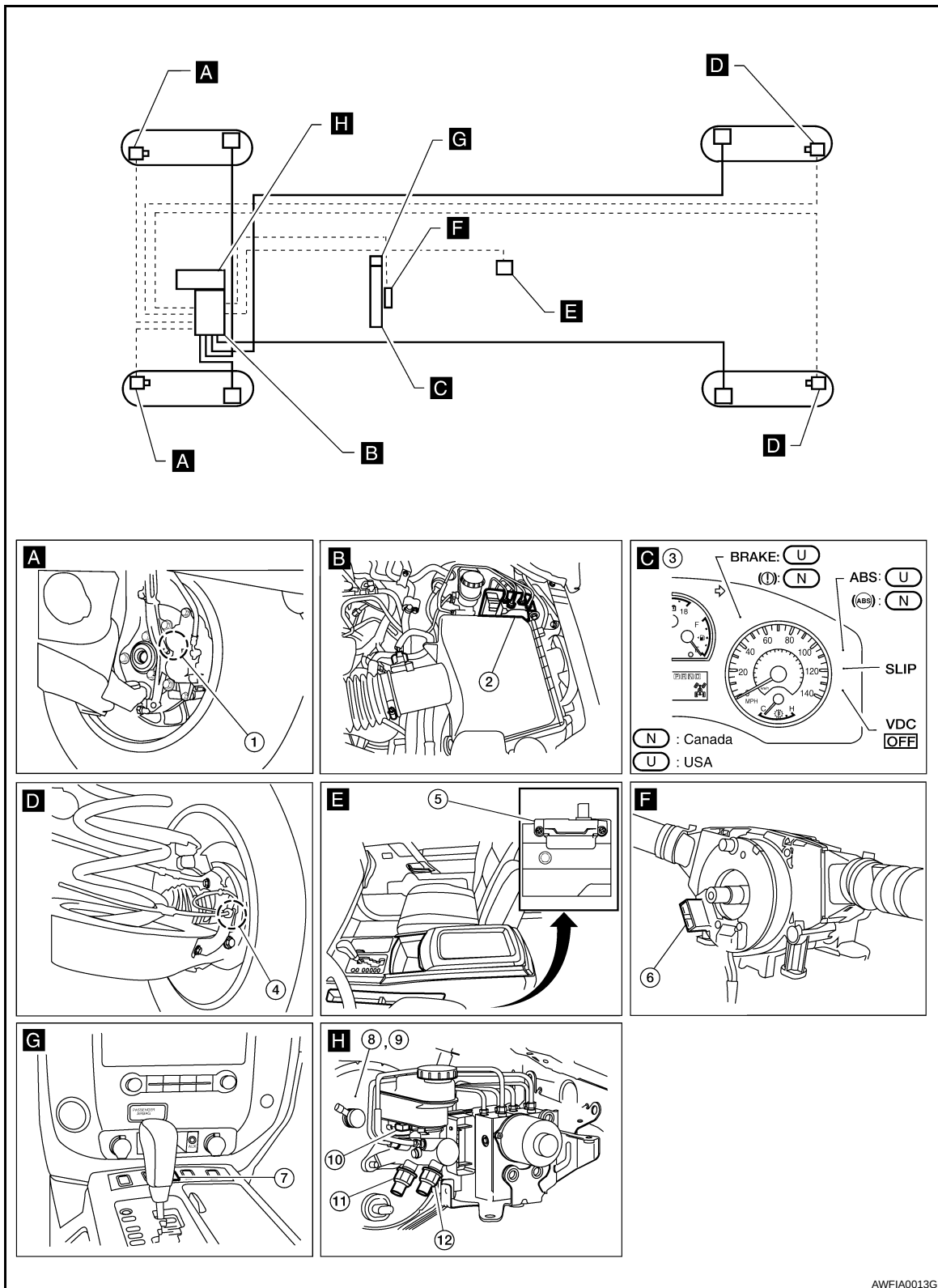
System Description

INFOID:000000001731070

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

Component Parts Location

INFOID:000000001731071



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< FUNCTION DIAGNOSIS >

- | | | |
|--|---|---|
| 1. Front wheel sensor
LH E18
RH E117 | 2. ABS actuator and electric unit (control unit) E125 | 3. Combination meter M24 |
| 4. Rear wheel sensor
LH C11
RH C10 | 5. Yaw rate/side/decel G sensor M108 | 6. Steering angle sensor M17 (view with steering wheel removed) |
| 7. VDC OFF switch M257 | 8. Active booster E49 | 9. Delta stroke sensor E114 |
| 10. Brake fluid level switch E21 | 11. Front pressure sensor E31 | 12. Rear pressure sensor E32 |

Component Description

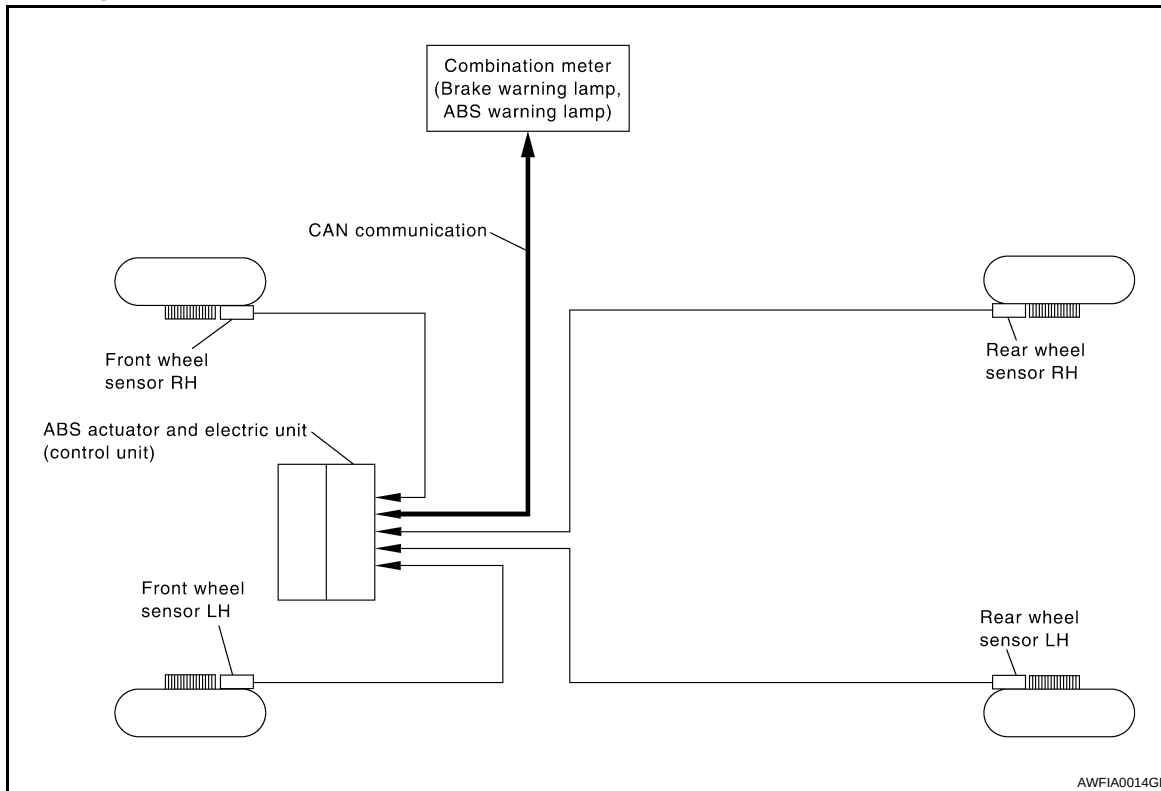
INFOID:000000001731072

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-39, "Description"
	Motor	
	Actuator relay	BRC-54, "Description"
	Solenoid valve	BRC-46, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	XX-XX, "*****"
Wheel sensor		BRC-30, "Description"
Yaw rate/side/decel G sensor		XX-XX, "*****"
Steering angle sensor		XX-XX, "*****"
VDC OFF switch		XX-XX, "*****"
ABS warning lamp		BRC-60, "Description"
Brake warning lamp		BRC-61, "Description"
VDC OFF indicator lamp		XX-XX, "*****"
SLIP indicator lamp		XX-XX, "*****"
Front pressure sensor		XX-XX, "*****"
Rear pressure sensor		
Active booster		XX-XX, "*****"
Delta stroke sensor		XX-XX, "*****"

ABS

System Diagram

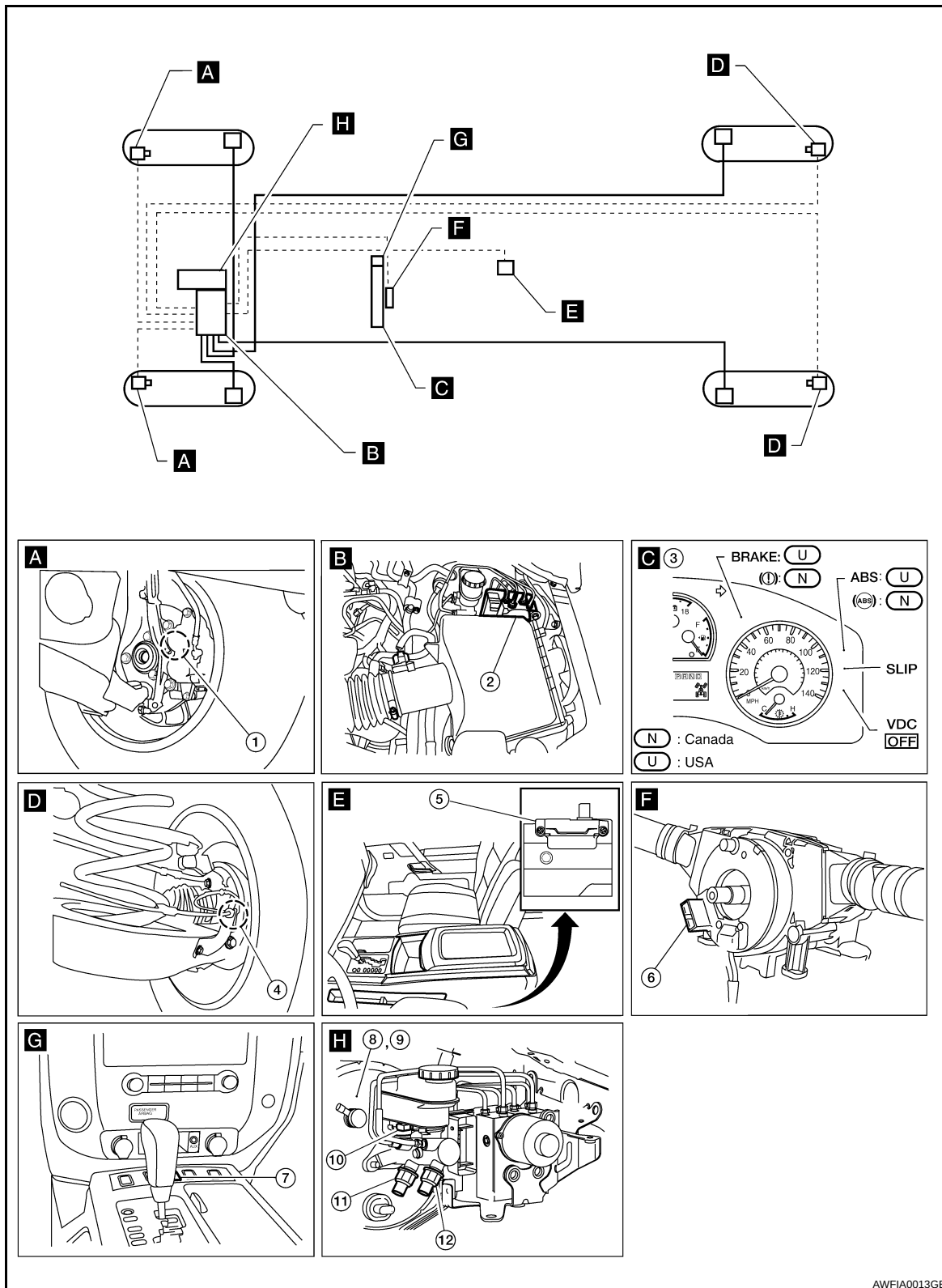
INFOID:000000001731073



System Description

INFOID:000000001731074

- 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.



1. Front wheel sensor
LH E18
RH E117

4. Rear wheel sensor
LH C11
RH C10

7. VDC OFF switch M257

10. Brake fluid level switch E21
2. ABS actuator and electric unit (control unit) E125

5. Yaw rate/side/decel G sensor M108

8. Active booster E49

11. Front pressure sensor E31
3. Combination meter M24

6. Steering angle sensor M17 (view with steering wheel removed)

9. Delta stroke sensor E114

12. Rear pressure sensor E32

Component Description

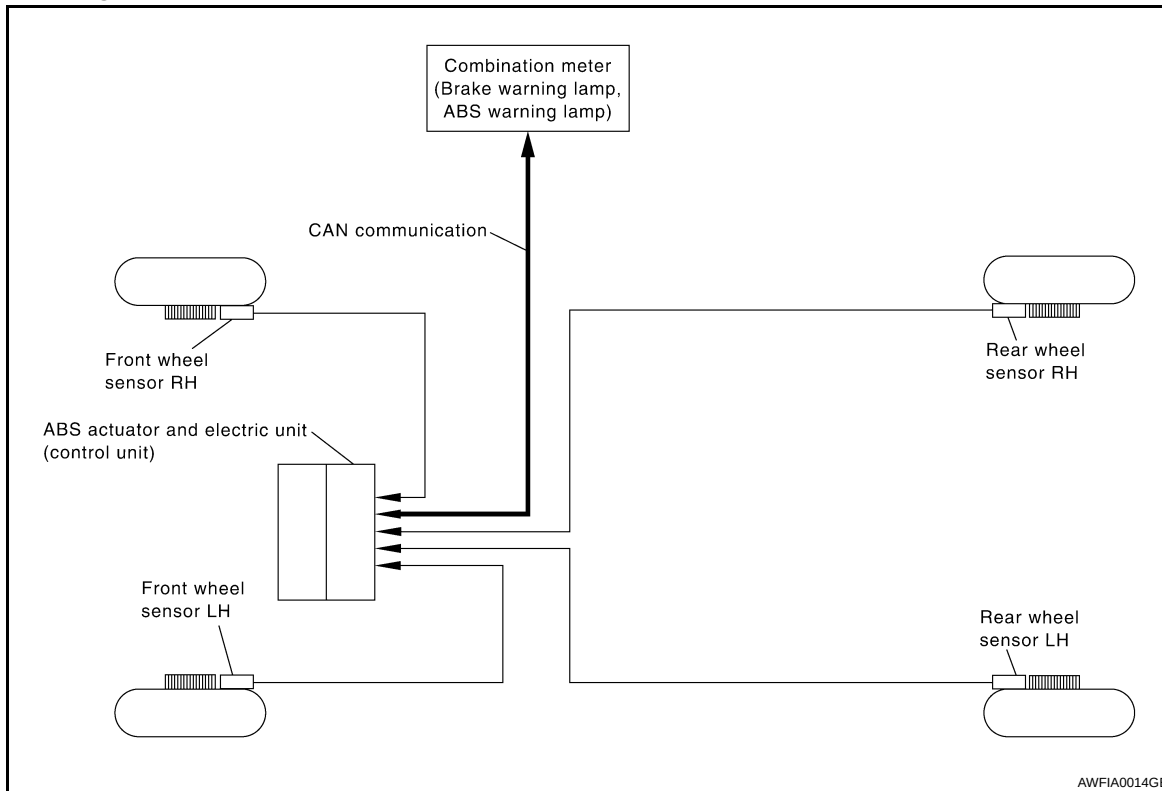
INFOID:000000001731076

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-39, "Description"
	Motor	
	Actuator relay	BRC-54, "Description"
	Solenoid valve	BRC-46, "Description"
Wheel sensor		BRC-30, "Description"
ABS warning lamp		BRC-60, "Description"
Brake warning lamp		BRC-61, "Description"

EBD

System Diagram

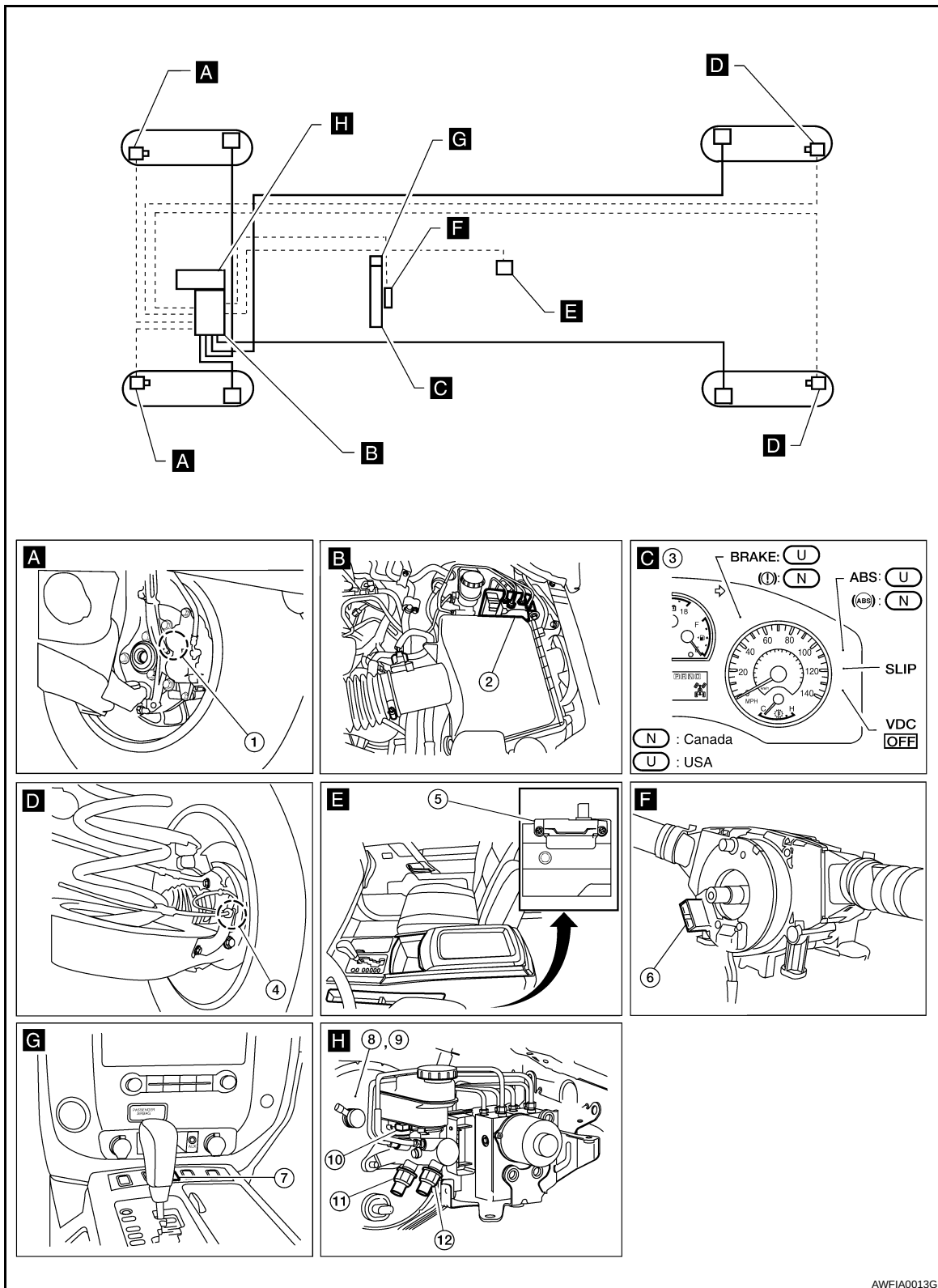
INFOID:000000001731077



System Description

INFOID:000000001731078

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



< FUNCTION DIAGNOSIS >

- | | | |
|--|---|---|
| 1. Front wheel sensor
LH E18
RH E117 | 2. ABS actuator and electric unit (control unit) E125 | 3. Combination meter M24 |
| 4. Rear wheel sensor
LH C11
RH C10 | 5. Yaw rate/side/decel G sensor M108 | 6. Steering angle sensor M17 (view with steering wheel removed) |
| 7. VDC OFF switch M257 | 8. Active booster E49 | 9. Delta stroke sensor E114 |
| 10. Brake fluid level switch E21 | 11. Front pressure sensor E31 | 12. Rear pressure sensor E32 |

Component Description

INFOID:0000000001731080

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-39, "Description"
	Motor	
	Actuator relay	BRC-54, "Description"
	Solenoid valve	BRC-46, "Description"
Wheel sensor		BRC-30, "Description"
ABS warning lamp		BRC-60, "Description"
Brake warning lamp		BRC-61, "Description"

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

< FUNCTION DIAGNOSIS >

[ESP/TCS/ABS]

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

CONSULT-III Function (ABS)

INFOID:000000001731081

FUNCTION

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

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

SELF-DIAG RESULTS MODE

Operation Procedure

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

How to Erase Self-diagnosis Results

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

CAUTION:

If memory cannot be erased, perform applicable diagnosis.

NOTE:

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

Display Item List

Refer to [BRC-71, "DTC No. Index"](#).

DATA MONITOR MODE

Display Item List

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

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

< FUNCTION DIAGNOSIS >

[ESP/TCS/ABS]

Item (Unit)	Data monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
RR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.
N POSI SIG	—	—	×	Shift position judged by PNP switch signal.
P POSI SIG	—	—	×	Shift position judged by PNP switch signal.
ACCEL POS SIG (%)	×	—	×	Throttle valve open/close status judged by CAN communication signal is displayed.
ENGINE SPEED (rpm)	×	×	×	Engine speed judged by CAN communication signal is displayed.
STR ANGLE SIG (deg)	×	—	×	Steering angle detected by steering angle sensor is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor is displayed.
SIDE G-SENSOR (m/s ²)	×	—	×	Transverse acceleration detected by side G-sensor is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
OFF SW (ON/OFF)	×	×	×	VDC OFF switch (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	—	×	×	ABS warning lamp (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	—	×	×	SLIP indicator lamp (ON/OFF) status is displayed.
FR LH IN SOL (ON/OFF)	—	×	×	Front LH IN ABS solenoid (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	—	×	×	Front LH OUT ABS solenoid (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	—	×	×	Rear RH IN ABS solenoid (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	—	×	×	Rear RH OUT ABS solenoid (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	—	×	×	Front RH IN ABS solenoid (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	—	×	×	Front RH OUT ABS solenoid (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	—	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	—	×	×	Rear LH OUT ABS solenoid (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	—	×	×	OFF Lamp (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	—	×	×	ABS motor relay signal (ON/OFF) status is displayed.
ACTUATOR RLY (ON/OFF)	—	×	×	ABS actuator relay signal (ON/OFF) status is displayed.

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

< FUNCTION DIAGNOSIS >

[ESP/TCS/ABS]

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

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

< FUNCTION DIAGNOSIS >

[ESP/TCS/ABS]

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

×: Applicable

—: Not applicable

ACTIVE TEST MODE

CAUTION:

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

NOTE:

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

Test Item

SOLENOID VALVE

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

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

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

< FUNCTION DIAGNOSIS >

[ESP/TCS/ABS]

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

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

ABS MOTOR

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

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

BOOSTER DRIVE

- Touch “UP” and “DOWN” on the screen. Check that booster drive operates as shown in table below.

CAUTION:

Perform active test subject to the conditions below.

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

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

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

INFOID:0000000001731082

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:0000000001731083

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-30. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731084

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

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

Is the inspection result normal?

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

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

- 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-182, "Removal and Installation"](#).

3.CHECK TIRES

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

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

YES >> GO TO 4

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

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to [FAX-5, "On-Vehicle Inspection and Service"](#) (front) or [RAX-5, "On-Vehicle Inspection and Service"](#) (rear).

Is the inspection result normal?

YES >> GO TO 5

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

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

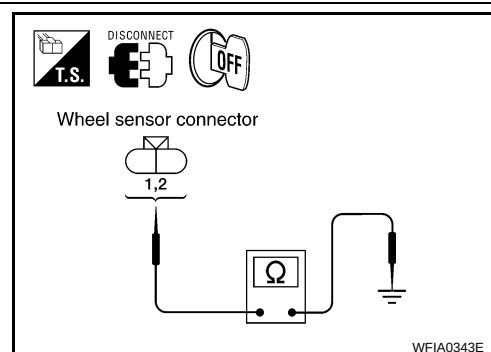
- Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

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

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

NO >> Repair the circuit.

Component Inspection**1.CHECK DATA MONITOR**

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

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	Nearly matches the speedometer display ($\pm 10\%$ 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:000000001731086

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

INFOID:0000000001731087

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:0000000001731088

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-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-33. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731089

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

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

Is the inspection result normal?

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

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

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-182, "Removal and Installation"](#).

3.CHECK TIRES

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

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

YES >> GO TO 4

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

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to [FAX-5, "On-Vehicle Inspection and Service"](#) (front) or [RAX-5, "On-Vehicle Inspection and Service"](#) (rear).

Is the inspection result normal?

YES >> GO TO 5

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

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

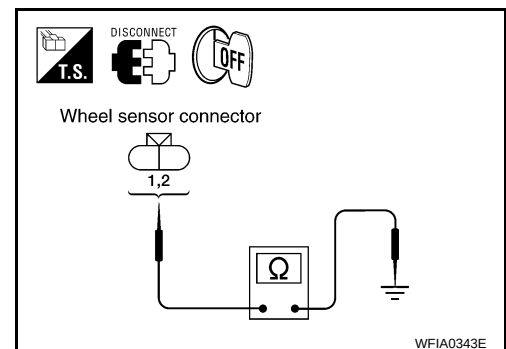
1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
2. Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

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

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

NO >> Repair the circuit.

Component Inspection

INFOID:000000001731090

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 ($\pm 10\%$ 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-33, "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:000000001731091

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1109 POWER AND GROUND SYSTEM

Description

INFOID:000000001731092

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

DTC Logic

INFOID:000000001731093

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-36, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731094

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
4. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).

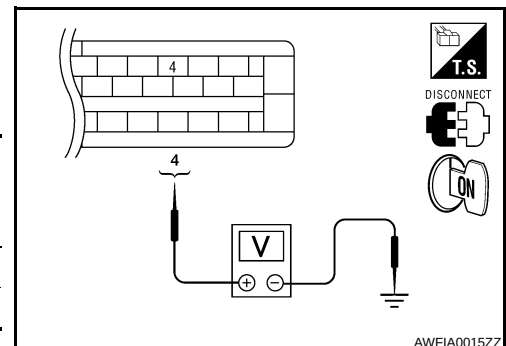
Is any item indicated on the self-diagnosis display?

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

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

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

ABS actuator and electric unit (control unit)		—	Condition	Voltage
Connector	Terminal			
E125	4	Ground	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	Approx. 0V



4. Turn ignition switch OFF.

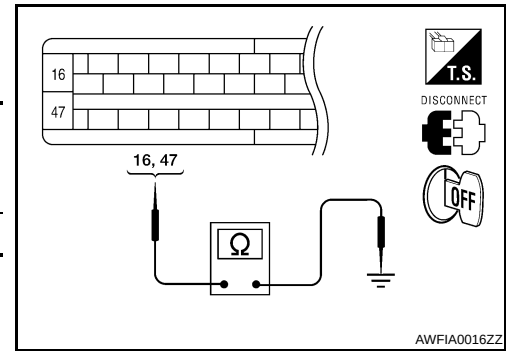
C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

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

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



Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000001731095

BRC

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91. "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

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

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

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

DTC Logic

INFOID:0000000001731096

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE
VARIANT CODING

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-38, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731097

INSPECTION PROCEDURE

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

- >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

Special Repair Requirement

INFOID:0000000001731098

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

- >> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

- >> END

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description

INFOID:0000000001731099

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:0000000001731100

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-39, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731101

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminal for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminal.
4. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).

Is any item indicated on the self-diagnosis display?

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

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

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

ABS actuator and electric unit (control unit)		—	Voltage
Connector	Terminal		
E125	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

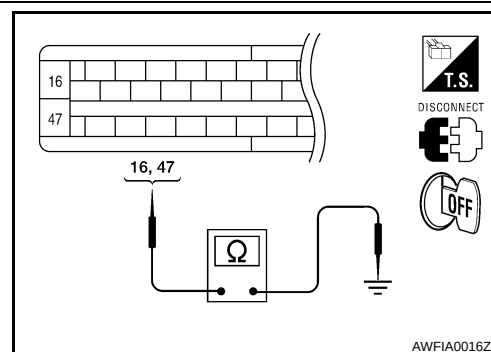
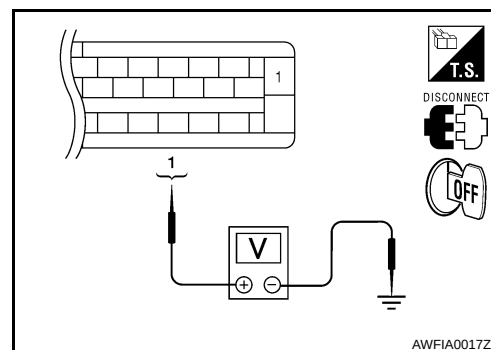
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).
Refer to [BRC-184, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.



INFOID:000000001731102

Component Inspection

1.CHECK ACTIVE TEST

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

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-39, "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:000000001731103

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

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

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

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

Description

INFOID:0000000001731104

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:0000000001731105

DTC DETECTION LOGIC

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

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-121, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731106

CAUTION:

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

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

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

Is the inspection result normal?

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

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

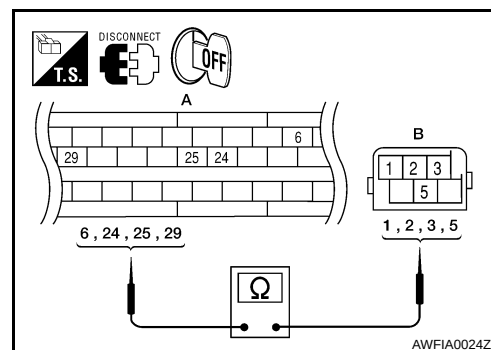
C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

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

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



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace as necessary.

3. YAW RATE/SIDE/DECEL G SENSOR INSPECTION

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

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

NO >> Replace the yaw rate/side/decel G sensor. Refer to [BRC-185, "Removal and Installation"](#).

Component Inspection

INFOID:000000001731107

1. CHECK DATA MONITOR

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

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-121, "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:000000001731108

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

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C1115 WHEEL SENSOR

Description

INFOID:000000001731109

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:000000001731110

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-41, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731111

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

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

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

Is the inspection result normal?

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

2. CHECK WHEEL SENSOR OUTPUT SIGNAL

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

NOTE:

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

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

NOTE:

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

Does the ABS active wheel sensor tester detect a signal?

- YES >> GO TO 3
 NO >> Replace the wheel sensor. Refer to [BRC-182, "Removal and Installation"](#).

3. CHECK TIRES

C1115 WHEEL SENSOR

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

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

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

YES >> GO TO 4

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

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to [FAX-5, "On-Vehicle Inspection and Service"](#) (front) or [RAX-5, "On-Vehicle Inspection and Service"](#) (rear).

Is the inspection result normal?

YES >> GO TO 5

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

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

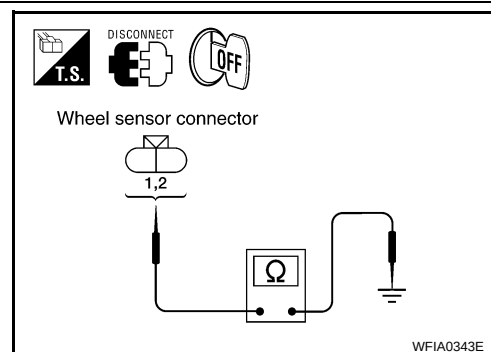
1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
2. Check continuity between wheel sensor harness connector terminals and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6.CHECK WIRING HARNESS FOR OPEN CIRCUIT

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

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

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

NO >> Repair the circuit.

Component Inspection

INFOID:0000000001731112

1.CHECK DATA MONITOR

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

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

C1115 WHEEL SENSOR

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

FR LH SENSOR	Nearly matches the speedometer display ($\pm 10\%$ 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-41. "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:000000001731113

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91. "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1116 STOP LAMP SWITCH

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1116 STOP LAMP SWITCH

Description

INFOID:000000001731114

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

DTC Logic

INFOID:000000001731115

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-44, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731116

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

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

2.STOP LAMP SWITCH INSPECTION

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

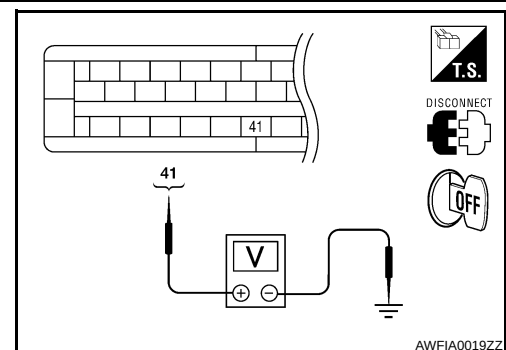
Brake pedal depressed : Battery voltage (approx. 12V)

Brake pedal not depressed : Approx. 0V

Is the inspection result normal?

- YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).
NO >> GO TO 3

3.STOP LAMP RELAY CIRCUIT INSPECTION



C1116 STOP LAMP SWITCH

[ESP/TCS/ABS]

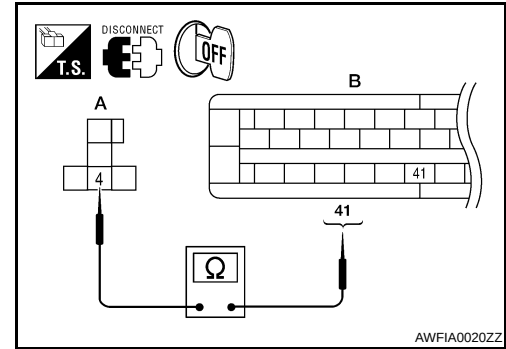
< COMPONENT DIAGNOSIS >

1. Disconnect the stop lamp relay harness connector E12.
2. Check the continuity between the ABS actuator and electric unit (control unit) harness connector E125 (B) terminal 41 and stop lamp relay harness connector E12 (A) terminal 4.

Continuity should exist.

Is the inspection result normal?

- YES >> Refer to [BRC-86, "Work Flow"](#).
NO >> Repair or replace malfunctioning components.



INFOID:000000001731117

Special Repair Requirement

1.AJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1120, C1122, C1124, C1126 IN ABS SOL

Description

INFOID:000000001731118

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:000000001731119

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-46. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731120

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
4. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25. "CONSULT-III Function \(ABS\)"](#).

Is any item indicated on the self-diagnosis display?

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

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

C1120, C1122, C1124, C1126 IN ABS SOL

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

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

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

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

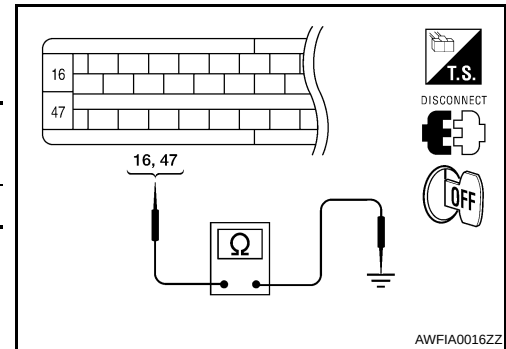
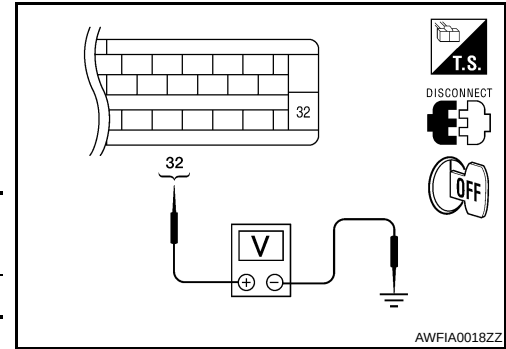
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).
Refer to [BRC-184, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.



Component Inspection

INFOID:000000001731121

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

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-46. "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:000000001731122

1.AJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91. "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

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C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

INFOID:000000001731123

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:000000001731124

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-49. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731125

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
4. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25. "CONSULT-III Function \(ABS\)"](#).

Is any item indicated on the self-diagnosis display?

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

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

C1121, C1123, C1125, C1127 OUT ABS SOL

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

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

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

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

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

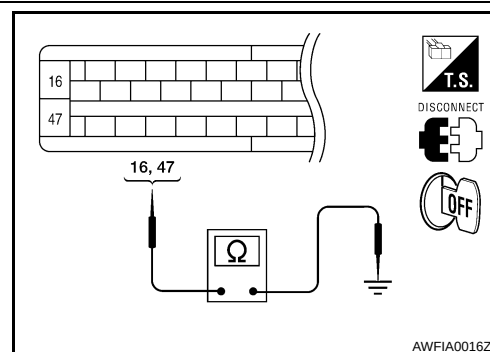
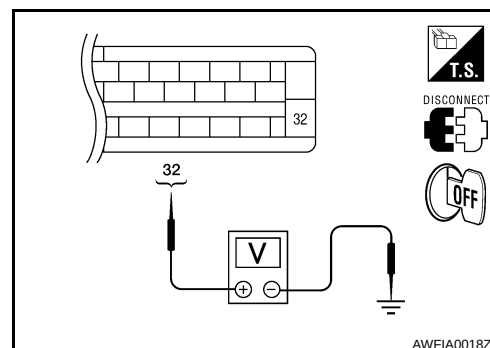
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).
Refer to [BRC-184, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning components.



Component Inspection

INFOID:000000001731126

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

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

Is the inspection result normal?

YES >> INSPECTION END

< COMPONENT DIAGNOSIS >

NO >> Go to diagnosis procedure. Refer to [BRC-49. "Diagnosis Procedure"](#).**Special Repair Requirement**

INFOID:000000001731127

1.AJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91. "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description

INFOID:0000000001731128

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

DTC Logic

INFOID:0000000001731129

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine fuel cut system is malfunctioning.	• 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		

BRC

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-52, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000001731130

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-107, "CONSULT-III Function"](#) (HR16DE with EURO-OBD)
 - [EC-462, "CONSULT-III Function"](#) (HR16DE without EURO-OBD)
 - [EC-772, "CONSULT-III Function"](#) (MR18DE)
 - [EC-1104, "Diagnosis Description"](#) (K9K)
2. Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).

Is any item indicated on the self-diagnosis display?

- YES >> Repair or replace the affected part.
NO >> INSPECTION END

Special Repair Requirement

INFOID:0000000001731131

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1140 ACTUATOR RLY

Description

INFOID:000000001731132

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

DTC Logic

INFOID:000000001731133

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ACTUATOR RLY

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-54, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731134

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
4. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).

Is any item indicated on the self-diagnosis display?

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

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

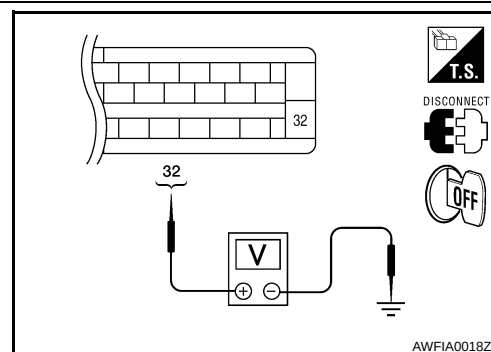
1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

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

Is the inspection result normal?

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

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



C1140 ACTUATOR RLY

[ESP/TCS/ABS]

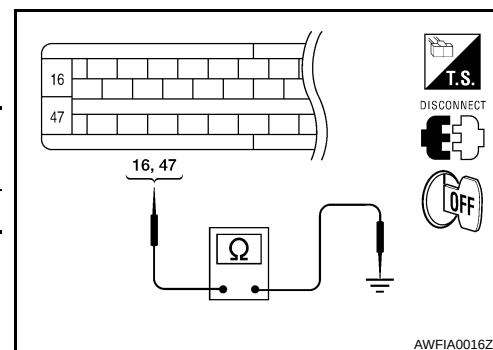
< COMPONENT DIAGNOSIS >

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

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

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit).
Refer to [BRC-184, "Removal and Installation"](#).
- NO >> Repair or replace malfunctioning components.



INFOID:000000001731135

Component Inspection

1.CHECK ACTIVE TEST

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

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Go to diagnosis procedure. Refer to [BRC-54, "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:000000001731136

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1142 PRESS SENSOR

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1142 PRESS SENSOR

Description

INFOID:000000001731137

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

DTC Logic

INFOID:000000001731138

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PRESS SEN CIRCUIT

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-139. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731139

FRONT PRESSURE SENSOR INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

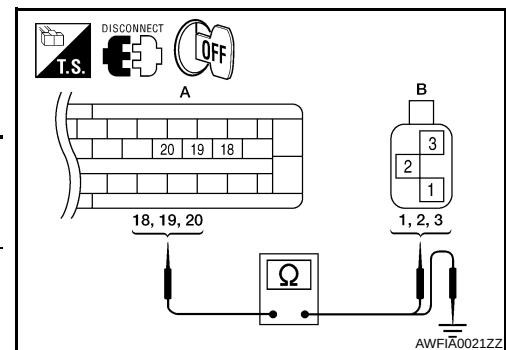
Is the inspection result normal?

- YES >> GO TO 2
NO >> Repair connector.

2.FRONT PRESSURE SENSOR CIRCUIT INSPECTION

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

ABS actuator and electric unit (control unit)		Front pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
A: E125	18	B: E31	3	Yes
	19		1	
	20		2	



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

C1142 PRESS SENSOR

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

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

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

3.FRONT PRESSURE SENSOR INSPECTION

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

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace the front pressure sensor.

REAR PRESSURE SENSOR INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

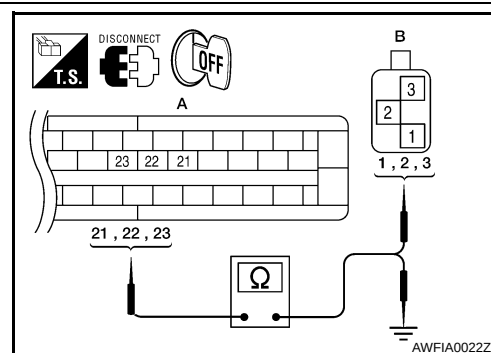
YES >> GO TO 2

NO >> Repair connector.

2.REAR PRESSURE SENSOR CIRCUIT INSPECTION

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

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



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

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

C1142 PRESS SENSOR

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

Is the inspection result normal?

- YES >> GO TO 3
NO >> Repair or replace harness or connector.

3. REAR PRESSURE SENSOR INSPECTION

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

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

Is the inspection result normal?

- YES >> Inspection End.
NO >> Replace the rear pressure sensor.

Component Inspection

INFOID:0000000001731140

BRC

1. CHECK DATA MONITOR

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

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

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to [BRC-139, "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:0000000001731141

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1143, C1144 STEERING ANGLE SENSOR

Description

INFOID:000000001731142

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:000000001731143

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 • 4WAS control unit (4WAS models) • 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-142. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731144

INSPECTION PROCEDURE

1.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Disconnect steering angle sensor connector.
4. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
5. Reconnect connectors and then perform the self-diagnosis. Refer to [BRC-25. "CONSULT-III Function \(ABS\)"](#)

Is any item indicated on the self-diagnosis display?

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

2.CHECK STEERING ANGLE SENSOR HARNESS

1. Turn ignition switch OFF.
2. Disconnect steering angle sensor connector.

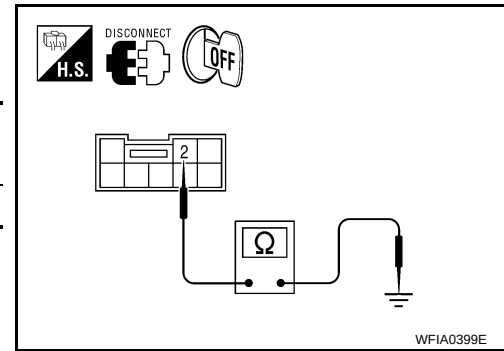
C1143, C1144 STEERING ANGLE SENSOR

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

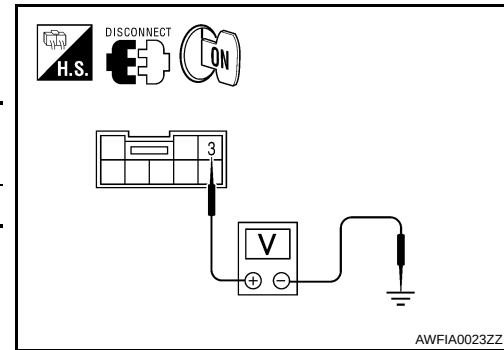
3. Check continuity between steering angle sensor harness connector terminal and ground.

Steering angle sensor		—	Continuity
Connector	Terminal		
M17	2	Ground	Yes



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

Steering angle sensor		—	Voltage
Connector	Terminal		
M17	3	Ground	Battery voltage



Is the inspection result normal?

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

3.CHECK DATA MONITOR

1. Connect the steering angle sensor connector and ABS actuator and electric unit (control unit) connector.
2. Select "STR ANGLE SIG" in "DATA MONITOR" and check steering angle sensor signal.

Steering condition	STR ANGLE SIG (DATA MONITOR)
Driving straight	$\pm 2.5^\circ$
Turn 90° to right	Approx. $+90^\circ$
Turn 90° to left	Approx. -90°

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-184. "Removal and Installation"](#).
NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to [BRC-186. "Removal and Installation"](#).

Component Inspection

INFOID:000000001731145

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	$\pm 2.5^\circ$
Turn 90° to right	Approx. $+90^\circ$
Turn 90° to left	Approx. -90°

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Go to diagnosis procedure. Refer to [BRC-142. "Diagnosis Procedure"](#).

Special Repair Requirement

INFOID:000000001731146

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

C1143, C1144 STEERING ANGLE SENSOR

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

C1155 BRAKE FLUID LEVEL SWITCH

Description

INFOID:000000001731147

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:000000001731148

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BR FLUID LEVEL LOW

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-56. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731149

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

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

Is the inspection result normal?

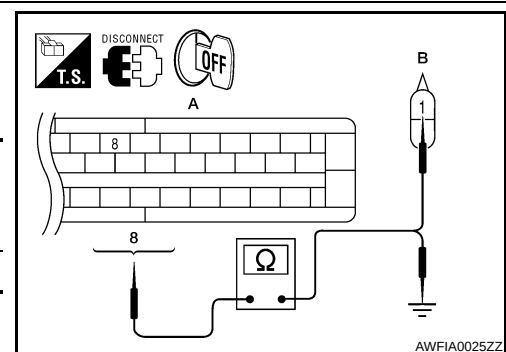
- YES >> GO TO 2
NO >> Repair or replace as necessary.

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

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

ABS actuator and electric unit (control unit)		Brake fluid level switch		Continuity
Connector	Terminal	Connector	Terminal	
A: E125	8	B: E21	1	Yes

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



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

Is the inspection result normal?

C1155 BRAKE FLUID LEVEL SWITCH

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

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

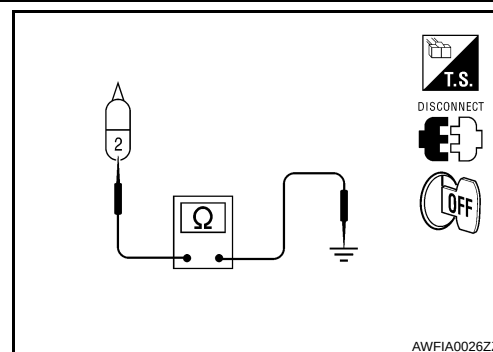
3.CHECK BRAKE FLUID LEVEL SWITCH GROUND

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

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

Is the inspection result normal?

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



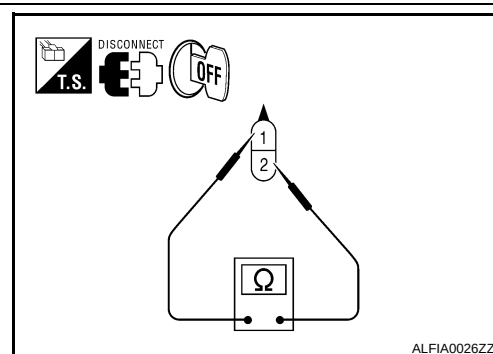
4.CHECK BRAKE FLUID LEVEL SWITCH

Check continuity between brake fluid level switch terminals.

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

Is the inspection result normal?

- YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).
NO >> Replace brake fluid level switch.



Component Inspection

INFOID:000000001731150

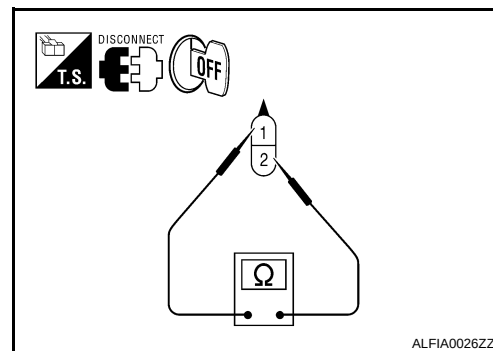
1.CHECK BRAKE FLUID LEVEL SWITCH

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

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

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace brake fluid level switch.



Special Repair Requirement

INFOID:000000001731151

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit).
Refer to [BRC-91. "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

- A
- B
- C
- D
- E
- BRC
- G
- H
- I
- J
- K
- L
- M
- N
- O
- P

C1156 ST ANG SEN COM CIR

Description

INFOID:000000001731152

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:000000001731153

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-148, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731154

INSPECTION PROCEDURE

1.CHECK CONNECTOR

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

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

Is above displayed on the self-diagnosis display?

- YES >> Refer to [BRC-86, "Work Flow"](#).
 NO >> INSPECTION END

C1160 DECEL G SEN SET

Description

INFOID:000000001731155

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:000000001731156

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1160	DECEL G SEN SET	ABS decel G sensor adjustment is incomplete.	- Decel G sensor calibration - Yaw rate/side/decel G sensor - ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
DECEL G SEN SET

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-149, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731157

INSPECTION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

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

Self-diagnosis results
DECEL G SEN SET

Do self-diagnosis results indicate anything other than shown above?

- YES >> Perform repair or replacement for the item indicated.
 NO >> Perform calibration of decel G sensor. Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#). GO TO 2

2.PERFORM SELF-DIAGNOSIS AGAIN

- Turn the ignition switch to OFF and then to ON and erase self-diagnosis results.
- Perform ABS actuator and electric unit (control unit) self-diagnosis again.

Are any self-diagnosis results displayed?

- YES >> Replace yaw rate/side/decel G sensor. Refer to [BRC-185, "Removal and Installation"](#).
 NO >> INSPECTION END

C1163 ST ANGLE SEN SAFE**Description**

INFOID:000000001731158

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:000000001731159

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1163	ST ANGL SEN SAFE	When steering angle sensor is in safe mode.	Adjust steering angle sensor neutral position

DTC CONFIRMATION PROCEDURE**1.CHECK SELF-DIAGNOSIS RESULTS**

Check the self-diagnosis results.

Self-diagnosis results
ST ANGL SEN SAFE

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-150, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731160

INSPECTION PROCEDURE**1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION**

Adjust steering angle sensor neutral position. Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.INDICATOR LAMP CHECK

Check that VDC OFF indicator lamp is off.

Is VDC OFF indicator lamp off?

- YES >> INSPECTION END
 NO >> Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).

C1179 ABS DELTA S SEN NG

Description

INFOID:000000001731171

The active brake booster consists of a vacuum booster, an active booster control group and a delta stroke sensor. If a brake booster system malfunction occurs due to loss of vacuum, the delta stroke sensor will signal the ABS actuator and electric unit (control unit) that a booster malfunction has occurred. The active booster then applies supplemental force to the master cylinder relative to the amount of force exerted on the brake pedal.

DTC Logic

INFOID:000000001731172

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1179	ABS DELTA S SEN NG	Delta stroke sensor is malfunctioning, or signal line of delta stroke sensor is open or shorted.	• Harness or connector • Delta stroke sensor • ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ABS DELTA S SEN NG

Is above displayed on the self-diagnosis display?

- YES >> Proceed to diagnosis procedure. Refer to [BRC-151, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001731173

INSPECTION PROCEDURE

1.CONNECTOR INSPECTION

1. Turn the ignition switch OFF.
2. Disconnect the delta stroke sensor connector E114 and ABS actuator and electric unit (control unit) connector E125 and inspect the terminals for deformation, disconnection, looseness, or damage.

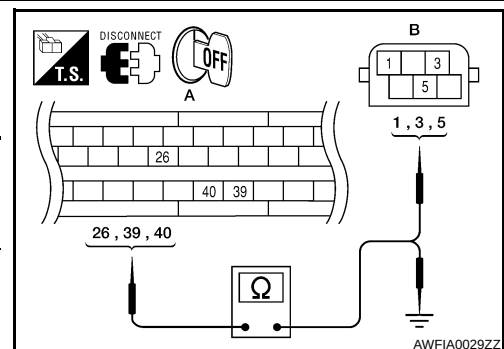
Is the inspection result normal?

- YES >> GO TO 2
 NO >> Repair connector.

2.DELTA STROKE SENSOR CIRCUIT INSPECTION

1. Measure the continuity between ABS actuator and electric unit (control unit) harness connector E125 (A) and delta stroke sensor harness connector E114 (B).

ABS actuator and electric unit (control unit)		Delta stroke sensor		Continuity
Connector	Terminal	Connector	Terminal	
A: E125	26	B: E114	1	Yes
	39		3	
	40		5	



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

< COMPONENT DIAGNOSIS >

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
A: E125	26	Ground	No
	39		
	40		

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

3.DELTA STROKE SENSOR INSPECTION

1. Reconnect the delta stroke sensor and ABS actuator and electric unit (control unit) connectors.
2. Use "DATA MONITOR" to check if the status of "DELTA S SEN" is normal.

Condition	DELTA S SEN (DATA MONITOR)
When brake pedal is depressed.	1.05–1.80 mm
When brake pedal is released.	0.00 mm (+0.6/-0.4)

Is the inspection result normal?YES >> Replace the ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

NO >> Replace the delta stroke sensor.

Component Inspection

INFOID:000000001731174

1.CHECK DATA MONITOR

Use "DATA MONITOR" to check if the status of "DELTA S SEN" is normal.

Condition	DELTA S SEN (DATA MONITOR)
When brake pedal is depressed.	1.05–1.80 mm
When brake pedal is released.	0.00 mm (+0.6/-0.4)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-151, "Diagnosis Procedure"](#).**Special Repair Requirement**

INFOID:000000001731175

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

U1000 CAN COMM CIRCUIT

Description

INFOID:000000001731176

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:000000001731177

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)

BRC

Diagnosis Procedure

INFOID:000000001731178

INSPECTION PROCEDURE

1.CHECK CONNECTOR

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

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

- YES >> Print out the self-diagnostic results, and refer to [BRC-86, "Work Flow"](#).
 NO >> Connector terminal is loose, damaged, open, or shorted.

Special Repair Requirement

INFOID:000000001731179

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-90, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"](#).

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to [BRC-91, "CALIBRATION OF DECEL G SENSOR : Description"](#).

>> END

VDC OFF SWITCH

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

VDC OFF SWITCH

Description

INFOID:000000001731180

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

Component Function Check

INFOID:000000001731181

1.CHECK VDC OFF SWITCH OPERATION

Turn ON/OFF the VDC OFF switch and check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly.

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-154. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001731182

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 Terminal	Condition	Continuity
1 - 2	When VDC OFF switch is pressed.	Yes
	When VDC OFF switch is released.	No

Is the inspection result normal?

YES >> GO TO 2

NO >> Replace VDC OFF switch.

2.CHECK VDC OFF SWITCH HARNESS

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) and VDC OFF switch connector M257 (B).

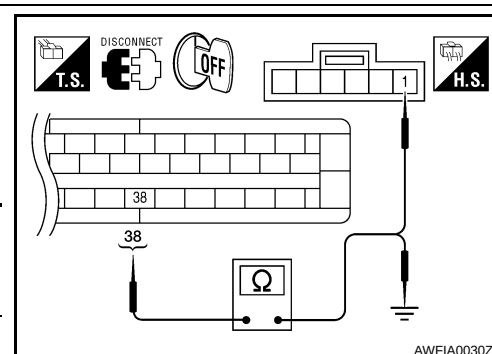
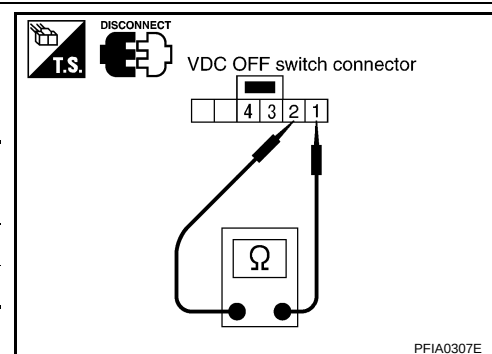
ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
A: E125	38	B: M257	1	Yes

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
A: E125	38	Ground	No

Is the inspection result normal?

YES >> GO TO 3



VDC OFF SWITCH

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

NO >> Repair or replace harness.

3.CHECK VDC OFF SWITCH GROUND

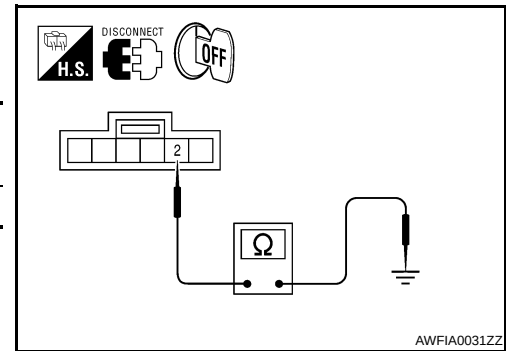
Check continuity between VDC OFF switch connector M257 and ground.

VDC OFF switch		—	Continuity
Connector	Terminal		
M257	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace harness.



4.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to [MWI-21, "Diagnosis Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-94, "Removal and Installation"](#).

Component Inspection

INFOID:000000001731183

INSPECTION PROCEDURE

1.CHECK VDC OFF SWITCH

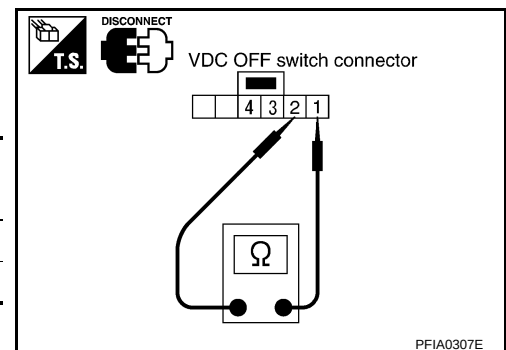
1. Turn ignition switch OFF.
2. Disconnect VDC OFF switch connector.
3. Check continuity between VDC OFF switch terminals.

VDC OFF switch	Condition	Continuity
Terminal		
1 – 2	When VDC OFF switch is pressed.	Yes
	When VDC OFF switch is released.	No

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace VDC OFF switch.



ABS WARNING LAMP

Description

INFOID:000000001731184

×: ON –: OFF

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

Component Function Check

INFOID:000000001731185

1.CHECK ABS WARNING LAMP OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-60, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001731186

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to [BRC-25, "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-21, "Diagnosis Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-94, "Removal and Installation"](#).

BRAKE WARNING LAMP

[ESP/TCS/ABS]

< COMPONENT DIAGNOSIS >

BRAKE WARNING LAMP

Description

INFOID:000000001731187

×: ON —: OFF

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

NOTE:

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

Component Function Check

INFOID:000000001731188

BRC

1. BRAKE WARNING LAMP OPERATION CHECK

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-61, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001731189

1. CHECK SELF-DIAGNOSIS

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

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to [MWI-21, "Diagnosis Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-94, "Removal and Installation"](#).

VDC OFF INDICATOR LAMP

Description

INFOID:000000001731190

×: ON –: OFF

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

Component Function Check

INFOID:000000001731191

1.VDC OFF INDICATOR LAMP OPERATION CHECK 1

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

Is the inspection result normal?

YES >> GO TO 2

NO >> Go to diagnosis procedure. Refer to [BRC-158, "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-154, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001731192

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-154, "Diagnosis Procedure"](#).

2.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to [BRC-25, "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-21, "Diagnosis Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-94, "Removal and Installation"](#).

SLIP INDICATOR LAMP

< COMPONENT DIAGNOSIS >

[ESP/TCS/ABS]

SLIP INDICATOR LAMP

Description

INFOID:000000001731193

x: ON –: OFF

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

Component Function Check

INFOID:000000001731194

1.CHECK SLIP INDICATOR LAMP OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [BRC-159. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001731195

1.CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to [BRC-25. "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-21. "Diagnosis Description"](#).

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-184. "Removal and Installation"](#).

NO >> Replace combination meter. Refer to [MWI-94. "Removal and Installation"](#).

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ESP/TCS/ABS]

ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000001731196

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

CONSULT-III MONITOR ITEM

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FR LH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
FR RH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
RR LH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
RR RH SENSOR	Wheel speed	0 [km/h (MPH)]	Vehicle stopped
		Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is depressed	ON
		When brake pedal is released	OFF
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON
		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G sensor	When vehicle is stopped	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 %
		Accelerator pedal depressed (ignition switch is ON)	0 - 100 %

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ESP/TCS/ABS]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
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 front 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 SPEED	With engine running	With engine stopped	0 rpm
		Engine running	Almost in accordance with tachometer display
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch ON	ON
		When brake fluid level switch OFF	OFF
FR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
FR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ESP/TCS/ABS]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
RR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
RR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
		When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay operation	When the actuator relay is operating	ON
		When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp (Note 3)	When ABS warning lamp is ON	ON
		When ABS warning lamp is OFF	OFF
OFF LAMP	VDC OFF indicator lamp (Note 3)	When VDC OFF indicator lamp is ON	ON
		When VDC OFF indicator lamp is OFF	OFF
SLIP LAMP	SLIP indicator lamp (Note 3)	When SLIP indicator lamp is ON	ON
		When SLIP indicator lamp is OFF	OFF
4WD FAIL REQ (Note 2)	Transfer control unit fail-safe signal	When transfer control unit is in fail-safe mode	ON
		When transfer control unit is normal	OFF
BST OPER SIG	Not applied but displayed	—	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

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ESP/TCS/ABS]

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
CV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
CV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
DECEL G-SEN	Longitudinal acceleration detected by Decel G-Sensor	Vehicle stopped	Approx. 0 G
		Vehicle running	-1.7 to 1.7 G
EBD WARN LAMP	EBD warning lamp (Note 3)	When EBD warning lamp is ON	ON
		When EBD warning lamp is OFF	OFF
N POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = N position	ON
		A/T shift position = other than N position	OFF
P POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = P position	ON
		A/T shift position = other than P position	OFF
R POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = R position	ON
		A/T shift position = other than R position	OFF
2WD/4WD	Drive axle	2WD model	2WD
		4WD model	4WD
PRESS SEN2	Brake fluid pressure detected by rear pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar
		With ignition switch turned ON and brake pedal depressed	-40 to 300 bar

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

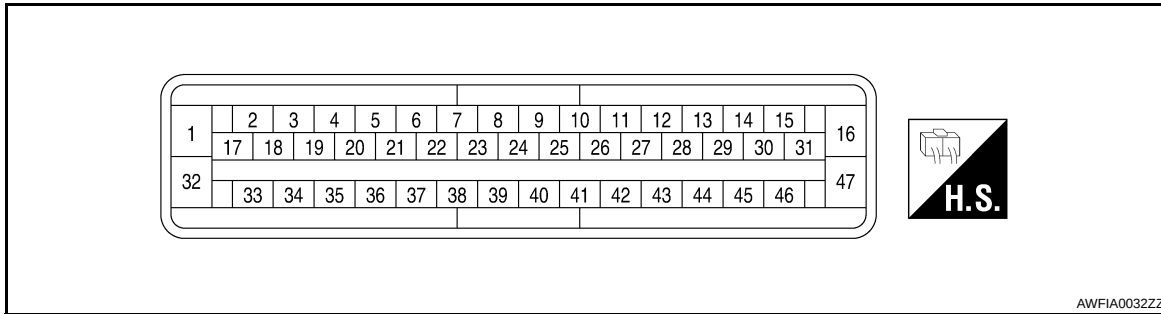
[ESP/TCS/ABS]

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
DELTA S SEN	Value detected by delta stroke sensor	When brake pedal is depressed	1.05 - 1.80 mm
		When brake pedal is released	0.00 mm (+0.6/-0.4)
RELEASE SWITCH NO	Active booster signal status	When brake pedal is depressed	ON
		When brake pedal is released	OFF
RELEASE SWITCH NC	Active booster signal status	When brake pedal is depressed	OFF
		When brake pedal is released	ON

NOTE:

- 1: Confirm tire pressure is normal.
- 2: Only 4WD models.
- 3: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to [BRC-60, "Description"](#).
- Brake warning lamp: Refer to [BRC-61, "Description"](#).
- VDC OFF indicator lamp: Refer to [XX-XX, "*****"](#).
- SLIP indicator lamp: Refer to [XX-XX, "*****"](#).

TERMINAL LAYOUT



ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ESP/TCS/ABS]

Wiring Diagram - LHD

INFOID:0000000001731197

NO
DATA

- A
- B
- C
- D
- E
- BRC
- G
- H
- I
- J
- K
- L
- M
- N
- O
- P

AWFWA0014GI

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ESP/TCS/ABS]

**NO
DATA**

AWFWA0015GI

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ESP/TCS/ABS]

Wiring Diagram - RHD

INFOID:0000000001731391

NO
DATA

- A
- B
- C
- D
- E
- BRC
- G
- H
- I
- J
- K
- L
- M
- N
- O
- P

AWFWA0016GI

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ESP/TCS/ABS]

NO
DATA

AWFWA0017GI

Fail-Safe

INFOID:000000001731198

CAUTION:

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

ABS/EBD SYSTEM

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ESP/TCS/ABS]

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

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

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

VDC/TCS SYSTEM

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

DTC No. Index

INFOID:000000001731199

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	BRC-30, "Description"
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	BRC-33, "Description"
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-36, "Description"
C1110	CONTROLLER FAILURE	BRC-38, "DTC Logic"
C1111	PUMP MOTOR	BRC-39, "Description"
C1113	G-SENSOR	XX-XX, "*****"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-41, "Description"
C1116	STOP LAMP SW	BRC-44, "Description"
C1120	FR LH IN ABS SOL	BRC-46, "Description"
C1121	FR LH OUT ABS SOL	BRC-49, "Description"
C1122	FR RH IN ABS SOL	BRC-46, "Description"
C1123	FR RH OUT ABS SOL	BRC-49, "Description"
C1124	RR LH IN ABS SOL	BRC-46, "Description"
C1125	RR LH OUT ABS SOL	BRC-49, "Description"
C1126	RR RH IN ABS SOL	BRC-46, "Description"
C1127	RR RH OUT ABS SOL	BRC-49, "Description"
C1130	ENGINE SIGNAL 1	BRC-52, "Description"
C1131	ENGINE SIGNAL 2	
C1132	ENGINE SIGNAL 3	
C1133	ENGINE SIGNAL 4	
C1136	ENGINE SIGNAL 6	
C1140	ACTUATOR RLY	BRC-54, "Description"
C1142	PRESS SEN CIRCUIT	XX-XX, "*****"
C1143	ST ANG SEN CIRCUIT	XX-XX, "*****"
C1144	ST ANG SEN SIGNAL	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS >

[ESP/TCS/ABS]

DTC	Items (CONSULT screen terms)	Reference
C1145	YAW RATE SENSOR	<u>XX-XX, ¹¹*****11</u>
C1146	SIDE G-SEN CIRCUIT	
C1155	BR FLUID LEVEL LOW	<u>BRC-56, "Description"</u>
C1156	ST ANG SEN COM CIR	<u>XX-XX, ¹¹*****11</u>
C1160	DECEL G SEN SET	<u>XX-XX, ¹¹*****11</u>
C1163	ST ANGL SEN SAFE	<u>XX-XX, ¹¹*****11</u>
C1164	CV1	<u>XX-XX, ¹¹*****11</u>
C1165	CV2	
C1166	SV1	
C1167	SV2	
C1170	VARIANT CORDING	<u>BRC-38, "DTC Logic"</u>
C1178	ABS ACTIVE BOOSTER SV NG	<u>XX-XX, ¹¹*****11</u>
C1179	ABS DELTA S SEN NG	<u>XX-XX, ¹¹*****11</u>
C1181	ABS ACTIVE BOOSTER RESPONSE NG	<u>XX-XX, ¹¹*****11</u>
C1184	ABS BRAKE RELEASE SW NG	
C1189	ABS BRAKE BOOSTER DEFECT	
U1000	CAN COMM CIRCUIT	<u>BRC-59, "Description"</u>

SYMPTOM DIAGNOSIS

VDC/TCS/ABS

Symptom Table

INFOID:000000001731200

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-74, "Diagnosis Procedure"
	Looseness of front and rear axle	
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-75, "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-76, "Diagnosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-77, "Diagnosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-78, "Diagnosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)	XX-XX, "*****"
	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. However, this is normal.
 - When shifting gears
 - When driving on slippery road
 - During cornering at high speed
 - When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]
 - When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

[ESP/TCS/ABS]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:0000000001731201

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-5, "On-Vehicle Inspection and Service"](#), Rear: [RAX-5, "On-Vehicle Inspection and 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-182, "Removal and Installation"](#).
• Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

Is the ABS warning lamp illuminated?

YES >> Perform self-diagnosis. Refer to [BRC-105, "CONSULT-III Function \(ABS\)"](#).

NO >> Normal

UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS >

[ESP/TCS/ABS]

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:000000001731202

1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to [BR-6, "Inspection and Adjustment"](#).

Is the stroke too large?

- YES >> • Bleed air from brake tube and hose. Refer to [BR-8, "Bleeding Brake System"](#).
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to [BR-6, "Inspection and Adjustment"](#) (brake pedal), [BR-18, "On-Board Inspection"](#) (master cylinder), [BR-19, "On Board Inspection"](#) (brake booster).

NO >> GO TO 2

2.CHECK FUNCTION

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

Is the inspection result normal?

- YES >> Normal
NO >> Check brake system.

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THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[ESP/TCS/ABS]

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000001731203

CAUTION:

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

1.CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[ESP/TCS/ABS]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000001731204

CAUTION:

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

1. CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> Normal

NO >> Perform self-diagnosis. Refer to [BRC-25, "CONSULT-III Function \(ABS\)".](#)

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PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

[ESP/TCS/ABS]

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:000000001731205

CAUTION:

Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal.

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

1. SYMPTOM CHECK 1

Check that there are pedal vibrations when the engine is started.

Do vibrations occur?

YES >> GO TO 2

NO >> Inspect the brake pedal.

2. SYMPTOM CHECK 2

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

Do the operation noises occur?

YES >> GO TO 3

NO >> Perform self -diagnosis. Refer to [BRC-25. "CONSULT-III Function \(ABS\)".](#)

3. SYMPTOM CHECK 3

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

Do symptoms occur?

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

NO >> Normal

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

[ESP/TCS/ABS]

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:000000001731206

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-diagnosis of ABS actuator and electric unit (control unit). Refer to [BRC-25, "CONSULT-III Function \(ABS\)"](#).

Are self-diagnosis results indicated?

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

3.CHECK CONNECTOR

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

Are self-diagnosis results indicated?

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

4.CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

Perform ECM and TCM self-diagnosis.

Are self-diagnosis results indicated?

- YES >> Check the corresponding items.
 - ECM, refer to:
 - [EC-107, "CONSULT-III Function"](#) (HR16DE with EURO-OBD)
 - [EC-462, "CONSULT-III Function"](#) (HR16DE without EURO-OBD)
 - [EC-772, "CONSULT-III Function"](#) (MR18DE)
 - [EC-1104, "Diagnosis Description"](#) (K9K)
 - TCM, refer to:
 - [TM-35, "CONSULT-III Function \(TRANSMISSION\)"](#) (4AT:RE4F03B type 1)
 - [TM-348, "CONSULT-III Function \(TRANSMISSION\)"](#) (4AT:RE4F03B type 2)
 - [TM-620, "System Description"](#) (RS5F91R)
 - [TM-664, "System Description"](#) (6MT: RS6F94R)
- NO >> Replace ABS actuator and electric unit (control unit). Refer to [BRC-184, "Removal and Installation"](#).

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[ESP/TCS/ABS]

NORMAL OPERATING CONDITION

Description

INFOID:000000001731207

Symptom	Result
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.	This is a normal condition due to the VDC, TCS or ABS activation.
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.	
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because TCS places the highest priority on the optimum traction (stability).
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	
The ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.	In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. At that time, erase the self-diagnosis memory.
VDC may not operate normally or the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp may illuminate, when running on a special road that is extremely slanted (e.g. bank in a circuit course).	
A malfunction may occur in the yaw rate/side/decel G sensor system, when the vehicle turns sharply, such as during a spin turn, axle turn, or drift driving, while the VDC function is off (VDC OFF indicator lamp illuminated).	
The vehicle speed will not increase even though the accelerator pedal is depressed, when inspecting the speedometer on a 2-wheel chassis dynamometer.	Normal (Deactivate the VDC/TCS function before performing an inspection on a chassis dynamometer.)
VDC OFF indicator lamp and SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a VDC system error but results from characteristic change of tire.

PRECAUTION

PRECAUTIONS

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

INFOID:000000001691411

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. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

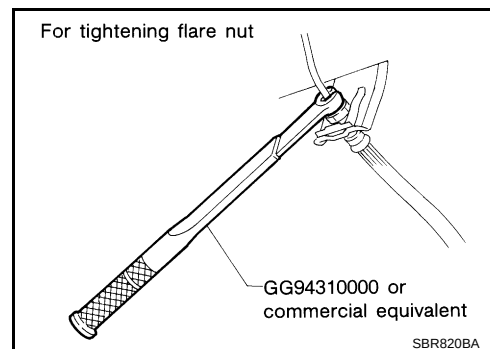
WARNING:

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

Precaution for Brake System

INFOID:000000001691412

- Recommended fluid is Genuine NISSAN Fluid, DOT 3 or DOT 4 (US FMVSS No. 116).
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Do not use mineral oils such as gasoline or kerosene to clean. They will ruin rubber parts and cause improper operation.
- Using a flare nut torque wrench, securely tighten brake tube flare nuts.
- 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 electrical connectors of ABS actuator and electric unit (control unit) or battery negative terminals.
- When installing brake piping, be sure to check torque.
- After removing/installing any hydraulic parts of the brake or ESP system (such as actuator and piping parts, etc), bleed air from the system.



Precaution for Brake Control

INFOID:000000001691413

- During ESP/TCS/ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- When starting engine, or just after starting vehicle, brake pedal may vibrate or motor operating noise may be heard from engine room. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from the customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides the electrical system inspection, check booster operation, brake fluid level, and fluid 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.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ESP/TCS/ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.

PRECAUTIONS

< PRECAUTION >

[ESP/TCS/ABS]

- If the following components are replaced with non-genuine components or converted, ESP OFF indicator lamp and SLIP indicator lamp may turn on or the ESP system may not operate properly. Components related to suspension (Shock Absorber, Strut, Spring, Bush, etc.), Tires, wheels (exclude specified size), components related to brake (Pad, Rotor, Caliper, etc.), components related to engine (Muffler, ECM, etc.), components related to body reinforcement (Roll bar, Tower bar, etc.).
- Driving in the condition of breakage or excessive wear of suspension, tires or components related to the brakes may cause ESP OFF indicator lamp and SLIP indicator lamp turn on, and the ESP system may not operate properly.
- When the TCS or ESP is activated by sudden acceleration or sudden turn, some noise may occur. The noise is a result of the normal operation of the TCS and ESP.
- When driving on roads which have extreme slopes (such as mountainous roads) or high banks (such as sharp curves on a freeway), the ESP may not operate normally, or ESP warning lamp and SLIP indicator lamp may turn on. However, this is not a malfunction, if normal operation can be resumed after restarting engine.
- Sudden turns (such as spin turns, acceleration turns), drifting, etc. When ESP function is OFF (ESP SW ON) may cause the G -sensor system indicate a malfunction. However, this is not a malfunction, if normal operation can be resumed after restarting engine.

Diagnosis Precaution

INFOID:000000001691414

CAN SYSTEM

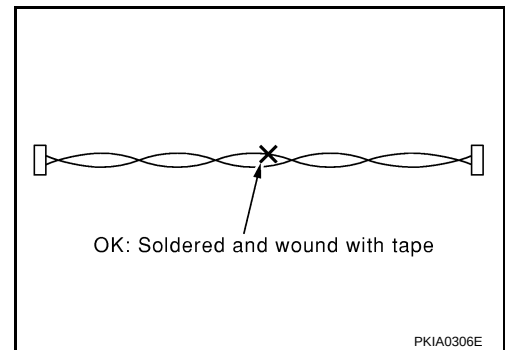
- Do not apply voltage of 7.0 V or higher to terminal to be measured.
- Maximum open terminal voltage of tester in use shall be 7.0 V or lower.
- Before checking harnesses, turn ignition switch OFF and disconnect battery negative cable.

Precaution for Harness Repair

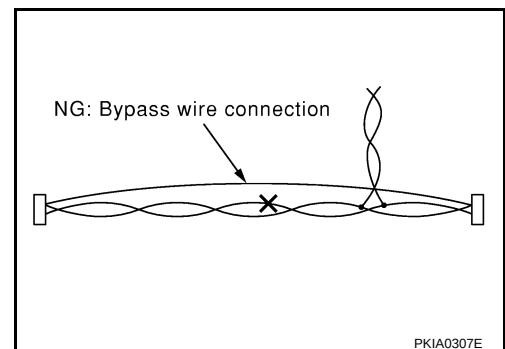
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CAN SYSTEM

- Area to be repaired shall be soldered, and wrapped with a tape [be sure that fraying of twisted wire shall be within 110 mm (4.33 in)].



- Do not make a bypass connection to repaired area. (If it is done, branch part will be removed and characteristics of twisted wire will be lost.)

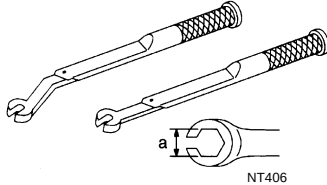


PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000001691416

Tool number Tool name	Description
GG94310000 Flare nut torque wrench a: 10 mm (0.39 in)	 Removing and installing each brake piping

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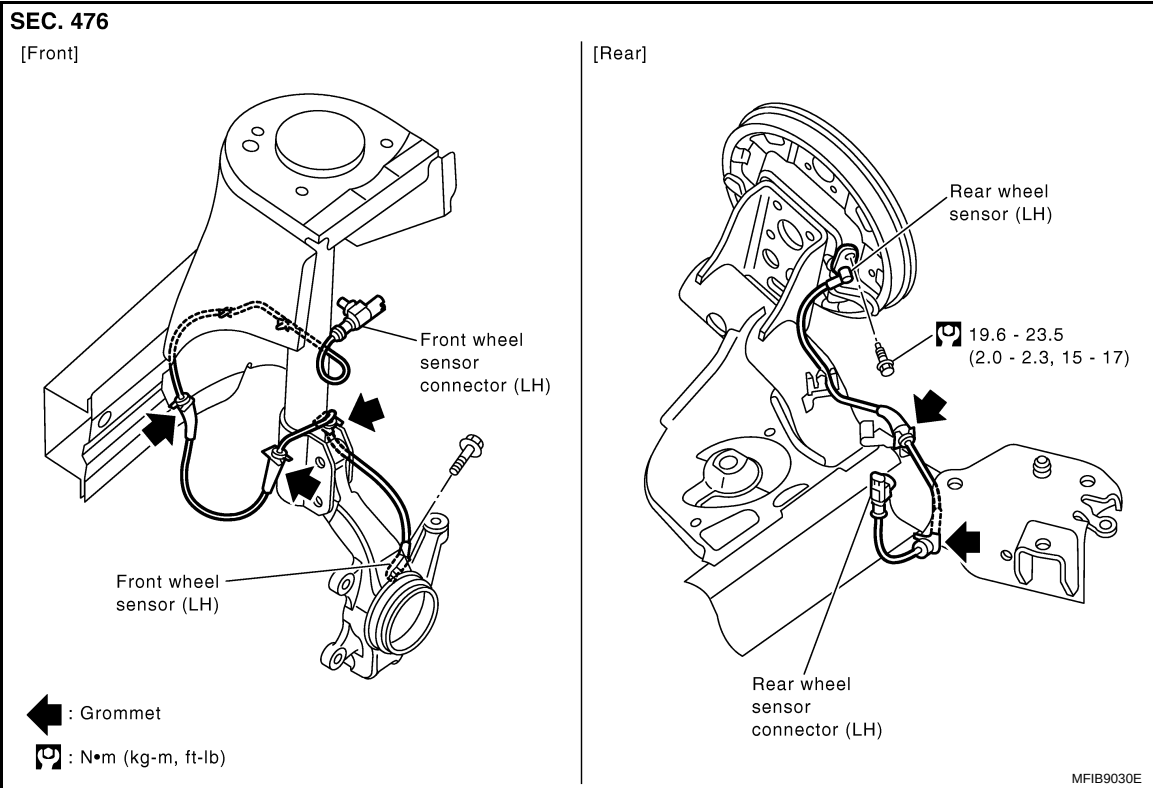
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REMOVAL AND INSTALLATION

WHEEL SENSORS

Removal and Installation

INFOID:000000001691451



REMOVAL

Be careful of the following.

CAUTION:

- When removing the sensor, do not rotate it if possible, and not forcibly pull the sensor harness.
- Before removing front or rear wheel hub, remove wheel sensor to avoid sensor wiring damage.

INSTALLATION

Be certain to tighten bolts to the specified torque. Be careful of the following:

- Check the inside of the sensor mounting hole for foreign material, the rotor surface for iron chips and other foreign material, and if anything is non-standard, clean it before installation, or replace it.
- When installing the front sensor, completely push in the strut bracket and body bracket rubber grommets until they lock so that the sensor harness does not become twisted. In addition, there should be no twists in the harness when installed. Install the harness so that the painted part faces the outside of the vehicle.
- When installing the rear sensor, completely push in the rubber bracket of the suspension arm bracket and lock the marking area of the side member harness mount so that the sensor harness will not be twisted. In addition, there should be no twists in the harness when installed.

SENSOR ROTOR

Removal and Installation

INFOID:000000001691452

FRONT

- Because the sensor rotor is integrated with the wheel bearing, replace it together with the wheel bearing assembly. Refer to [FAX-7, "Removal and Installation"](#).

REAR

- During removal and installation, remove the wheel hub (brake drum). Refer to [RAX-6, "Removal and Installation"](#).

CAUTION:

The sensor rotor is a non-reusable part, it must be replaced by an new part when removing it.

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ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

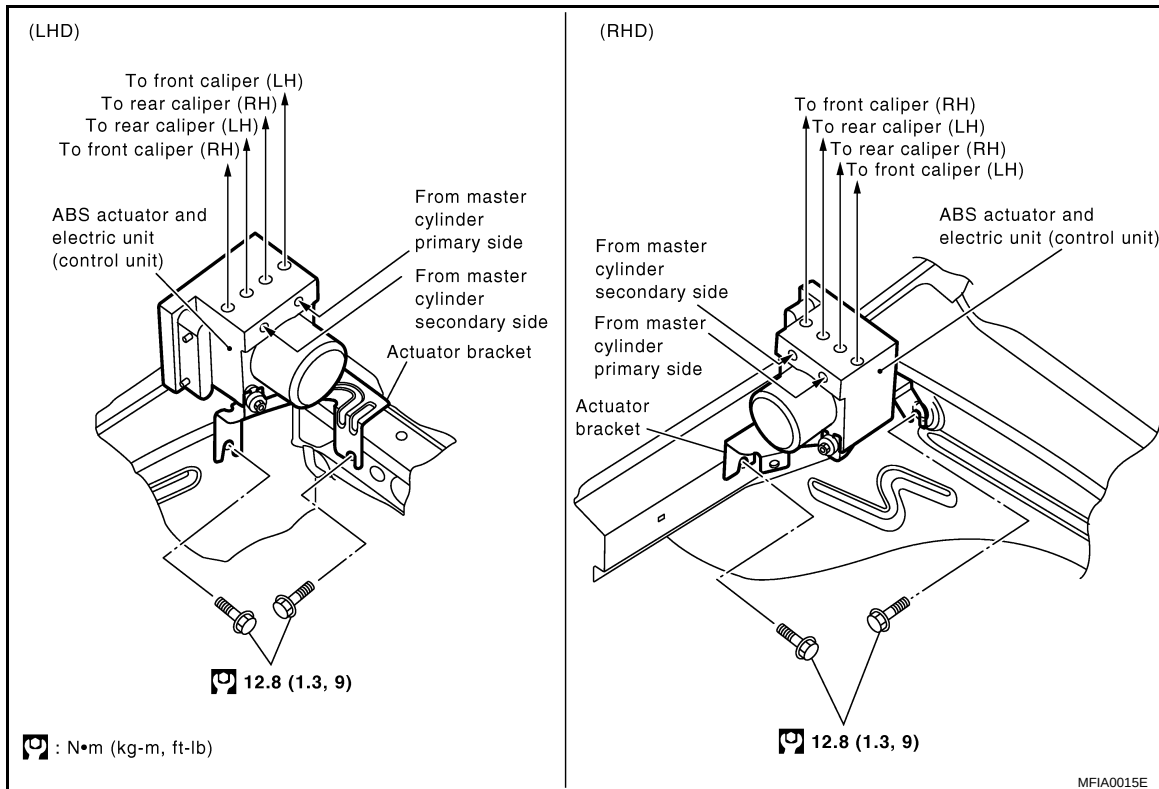
< REMOVAL AND INSTALLATION >

[ESP/TCS/ABS]

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation

INFOID:000000001691453



REMOVAL

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit).
3. Remove ABS actuator and electric unit (control unit) mounting nuts.
4. Remove ABS actuator and electric unit (control unit) from vehicle.

CAUTION:

Be careful of the following when removing ABS actuator and electric unit (control unit).

- If the part number on the part number label (pasted on actuator upper surface) is the same, ABS actuator and electric unit (control unit) cannot be used on another vehicle.

If it is used on another vehicle, ABS warning lamp, SLIP indicator lamp and ESP OFF indicator lamp may turn ON or ESP/TCS/ABS may not operate normally.

When replacing ABS actuator and electric unit (control unit), must use new service parts.

- Before servicing, disconnect battery cables.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use a flare nut torque wrench (commercial service tool) and tighten to the specified torque.
- Do not apply excessive impact to actuator, such as dropping it.
- Do not remove and install ABS actuator and electric unit (control unit) by holding harness.

INSTALLATION

To install, follow procedure for removal in reverse order.

CAUTION:

Be careful of the following when installing ABS actuator and electric unit (control unit).

- Tighten the mounting bolts and nuts to the specified torque.
- After the work, bleed air from brake piping. Refer to [BR-8, "Bleeding Brake System"](#).
- After installing vehicle harness connector in the actuator, make sure connector is securely locked.

YAW RATE/SIDE G SENSOR

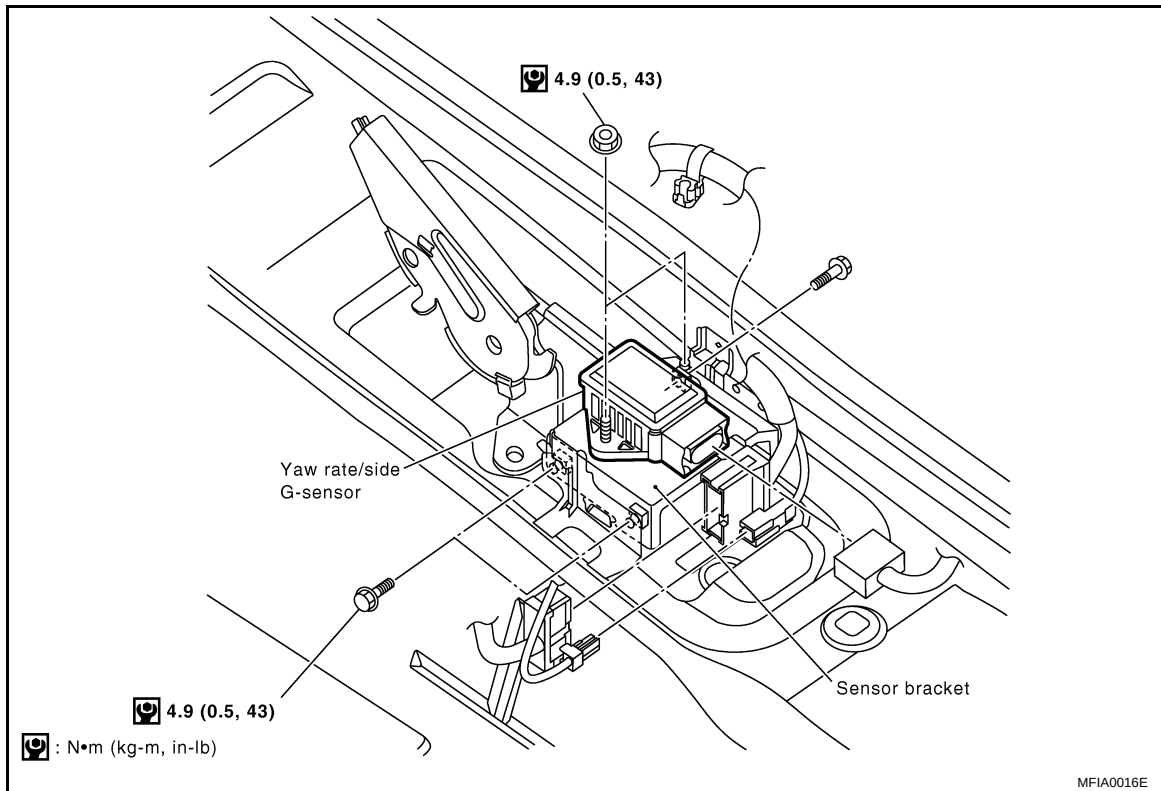
< REMOVAL AND INSTALLATION >

[ESP/TCS/ABS]

YAW RATE/SIDE G SENSOR

Removal and Installation

INFOID:000000001691454



REMOVAL

1. Remove center console. Refer to [IP-10, "Component Parts"](#).
2. Disconnect yaw rate/side G-sensor harness connector.
3. Remove yaw rate/side G-sensor mounting bolts. Then remove yaw rate/side G-sensor from vehicle.

CAUTION:

- Do not drop or strike yaw rate/side G-sensor, because it has little endurance to impact.
- Do not use power tool etc., because yaw rate/side G-sensor is weak for the impact.

INSTALLATION

To install, follow procedure for removal in reverse order.

CAUTION:

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

STEERING ANGLE SENSOR

< REMOVAL AND INSTALLATION >

[ESP/TCS/ABS]

STEERING ANGLE SENSOR

Removal and Installation

INFOID:0000000001691455

For removal and installation of steering angle sensor, refer to [SR-7, "Removal and Installation"](#).