# SECTION BRC
# BRAKE CONTROL SYSTEM

## CONTENTS

### VDC/TCS/ABS

## BRAKE ASSIST (WITH PREVIEW FUNCTION)

# BASIC INSPECTION

## DIAGNOSIS AND REPAIR WORKFLOW

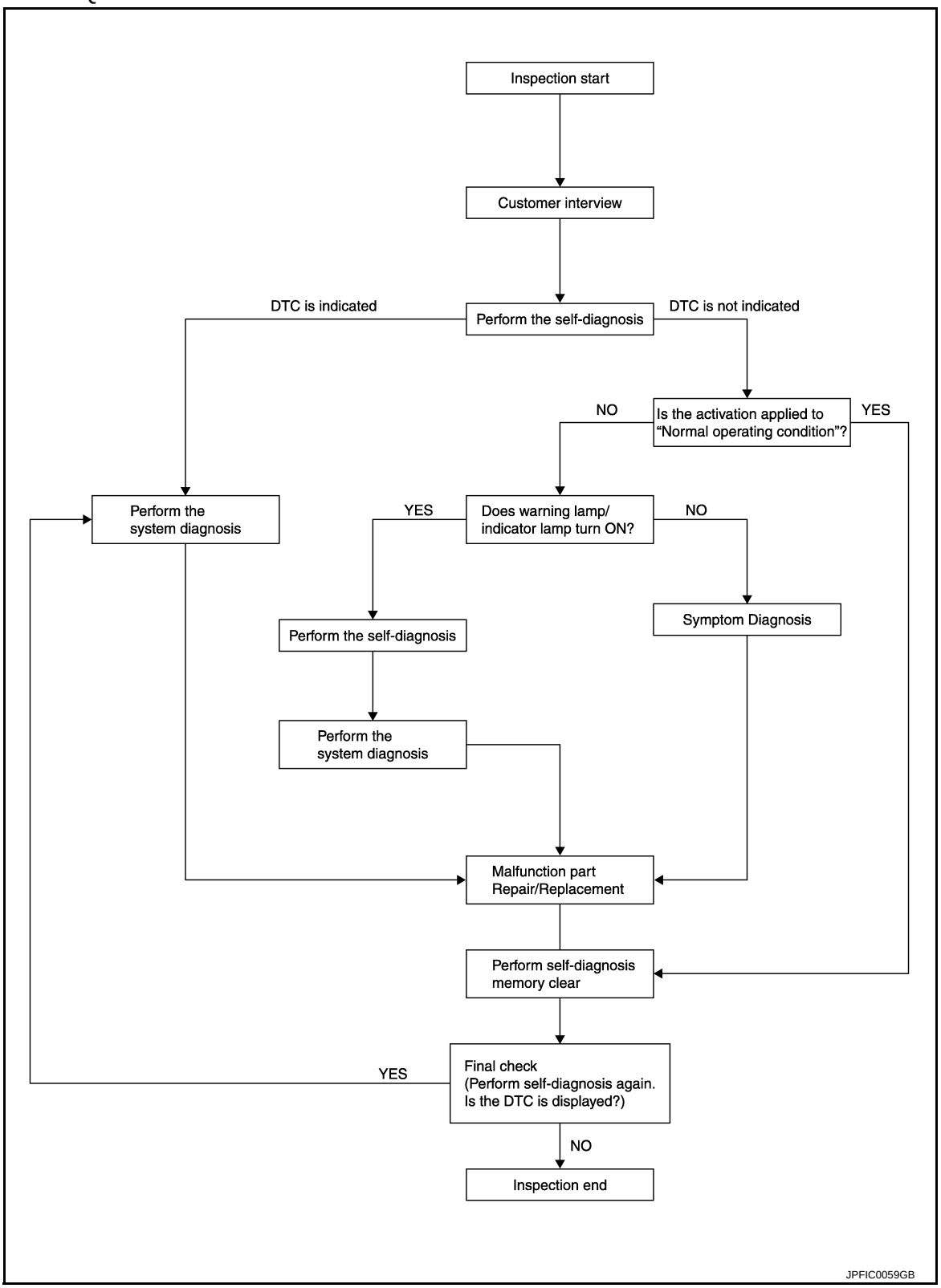
### Work Flow

INFOID:0000000006472076

#### 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-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

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 work sheet. Refer to BRC-8, "Diagnostic Work Sheet".

>> GO TO 2.

## 2.PERFORM THE SELF-DIAGNOSIS

Perform self-diagnosis for “ABS” with CONSULT-III.

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 of “ABS” with CONSULT-III. Refer to BRC-103, "DTC 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-110, "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-87, "Description".
- Brake warning lamp: refer to BRC-88, "Description".
- VDC OFF indicator lamp: refer to BRC-89, "Description".
- VDC warning lamp: refer to BRC-90, "Description".

Is ON/OFF timing normal?

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

## 6.PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom of “ABS” with CONSULT-III.

>> GO TO 7.

## 7.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 8.

## 8.MEMORY CLEAR

Perform self-diagnosis memory clear for “ABS” with CONSULT-III.

>> GO TO 9.

## 9.FINAL CHECK

Perform the self-diagnosis again, and check that the malfunction is repaired completely.

Is no other DTC present and the repair completed?

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

## Diagnostic Work Sheet

INFOID:0000000006472077

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

SFIA3265E

# INSPECTION AND ADJUSTMENT

## ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

### ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

INFOID:0000000006472078

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

### ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement

INFOID:0000000006472079

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

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

## ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

### ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:0000000006472080

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

×: Required –: Not required

| Situation | Adjustment of steering angle sensor neutral position |
|---|---|
| Removing/Installing ABS actuator and electric unit (control unit) | — |
| Replacing ABS actuator and electric unit (control unit) | × |
| Removing/Installing steering angle sensor | × |
| Replacing steering angle sensor | × |
| Removing/Installing steering components | × |
| Replacing steering components | × |
| Removing/Installing suspension components | × |
| Replacing suspension components | × |
| Removing/Installing tire | — |
| Change tires to new ones | — |
| Tire rotation | — |
| Adjusting wheel alignment | × |

### ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement

INFOID:0000000006472081

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

**CAUTION:**

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

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2.

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

1. Select “ABS”, "WORK SUPPORT" and “ST ANGLE SENSOR ADJUSTMENT" in order with CONSULT-III.

2. Select “START”.
   **CAUTION:**
   **Never touch steering wheel while adjusting steering angle sensor.**
3. After approximately 10 seconds, select “END”.
   **NOTE:**
   After approximately 60 seconds, it ends automatically.
4. Turn the ignition switch OFF, then turn it ON again.
   **CAUTION:**
   **Be sure to perform above operation.**

>> GO TO 3.

## 3. CHECK DATA MONITOR

1. Run the vehicle with front wheels in straight-ahead position, then stop.
2. Select “ABS”, “DATA MONITOR” and “STR ANGLE SIG” in order with CONSULT-III, and check steering angle sensor signal.

**STR ANGLE SIG : 0±2.5°**

Is the steering angle within the specified range?

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

## 4. ERASE THE SELF-DIAGNOSIS MEMORY

Erase self-diagnosis memories for “ABS”, “ENGINE” and “ICC/ADAS” with CONSULT-III.
- “ABS”: refer to BRC-27, "CONSULT-III Function".
- “ENGINE”: refer to EC-127, "Diagnosis Description".
- “ICC/ADAS”: refer to CCS-36, "CONSULT-III Function (ICC/ADAS)".

Are the memories erased?

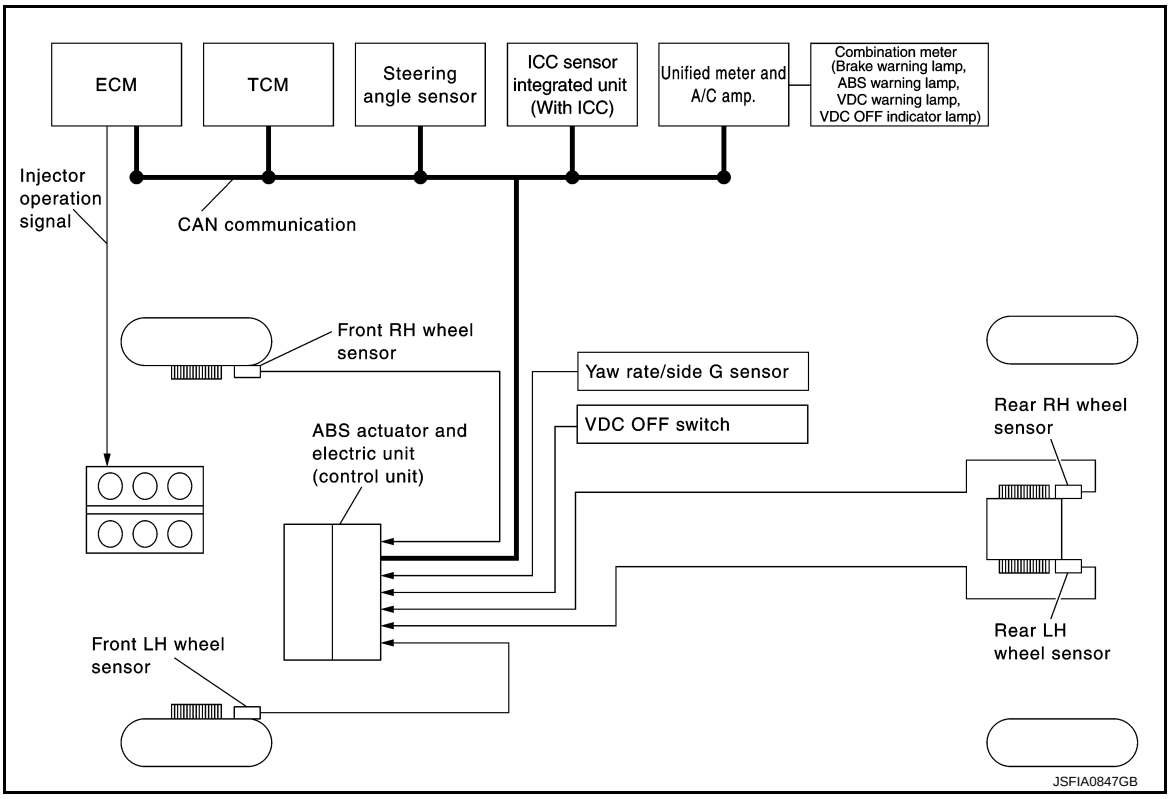
YES >> INSPECTION END
NO >> Check the items indicated by the self-diagnosis.

# SYSTEM DESCRIPTION

## VDC

### System Diagram

INFOID:0000000006472082




### System Description

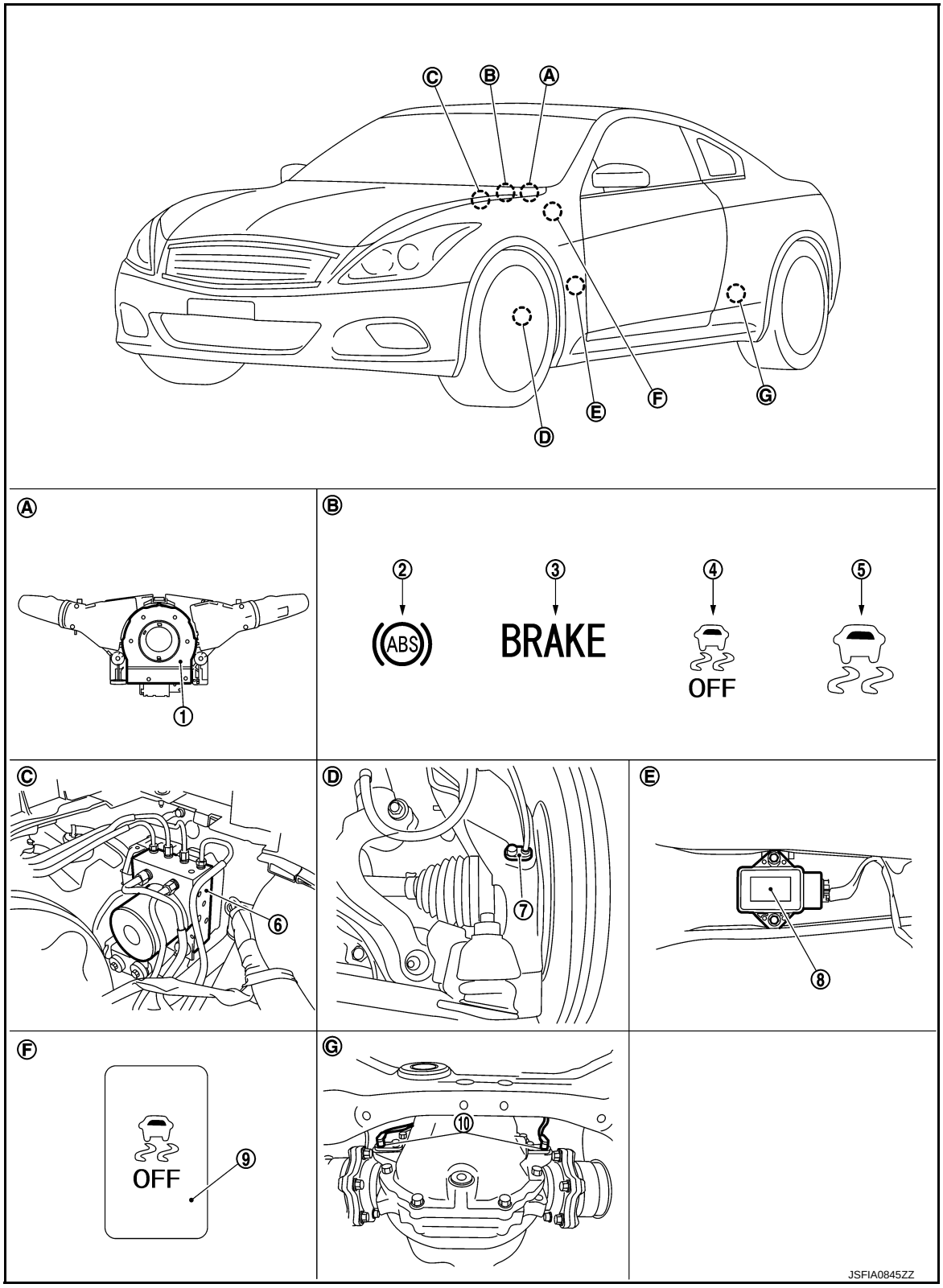
INFOID:0000000006472083

- Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from steering angle sensor and pressure sensor. Using information from yaw rate/side 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 VDC warning lamp.
- Electrical system diagnosis by CONSULT-III is available.

### Component Parts Location

INFOID:0000000006472084

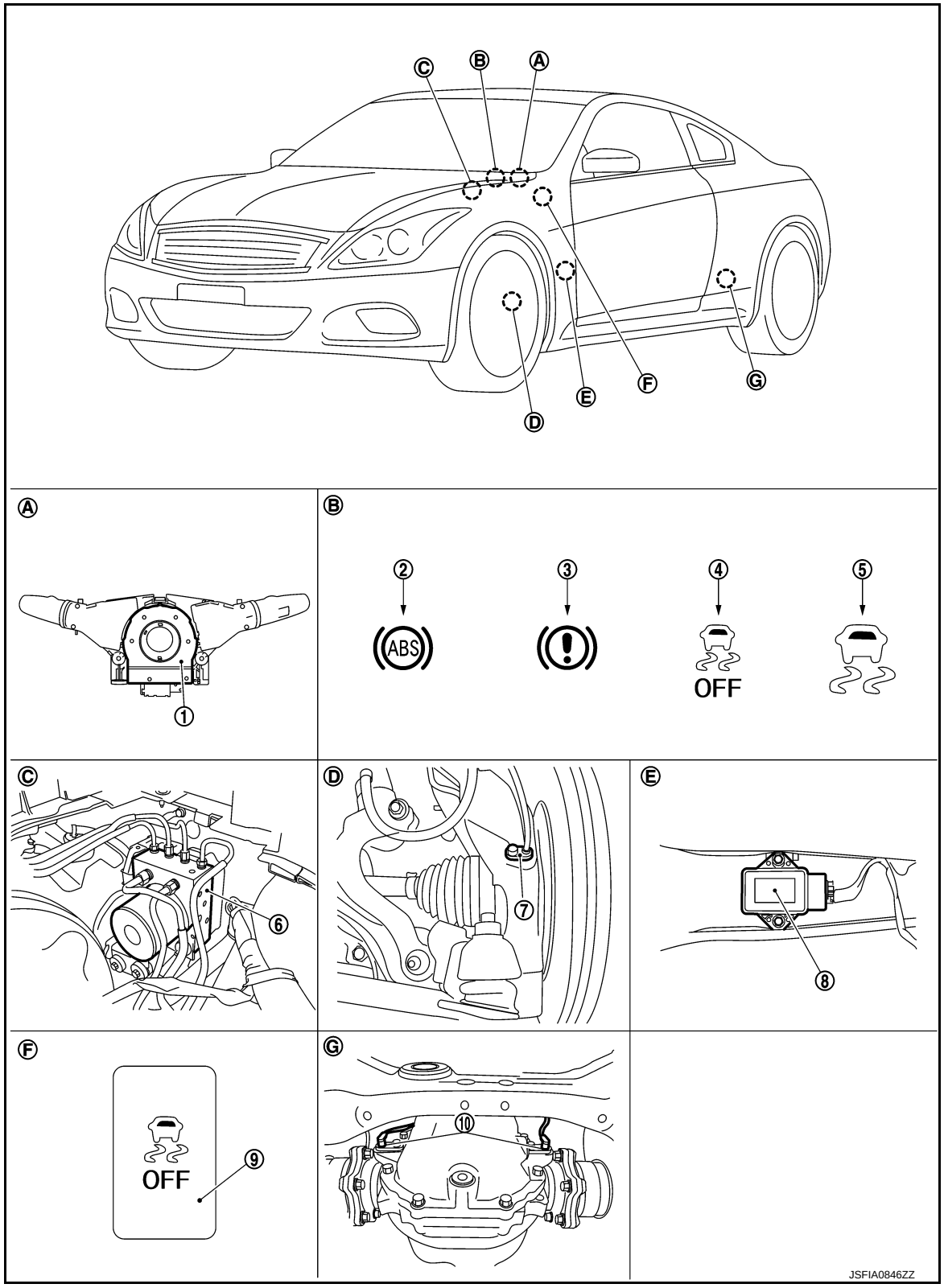
FOR USA




1. Steering angle sensor
2. ABS warning lamp
3. Brake warning lamp
4. VDC OFF indicator lamp
5. VDC warning lamp
6. ABS actuator and electric unit (control unit)
7. Front wheel sensor
8. Yaw rate/side G sensor
9. VDC OFF switch
10. Rear wheel sensor

A. Back of spiral cable assembly
B. Combination meter
C. Inside brake master cylinder cover
D. Steering knuckle
E. Under center console
F. Instrument driver lower panel
G. Rear final drive assembly

FOR CANADA



1. Steering angle sensor
2. ABS warning lamp
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4. VDC OFF indicator lamp
5. VDC warning lamp
6. ABS actuator and electric unit (control unit)
7. Front wheel sensor
8. Yaw rate/side G sensor
9. VDC OFF switch
10. Rear wheel sensor

A. Back of spiral cable assembly
B. Combination meter
C. Inside brake master cylinder cover
D. Steering knuckle
E. Under center console
F. Instrument driver lower panel
G. Rear final drive assembly

## Component Description

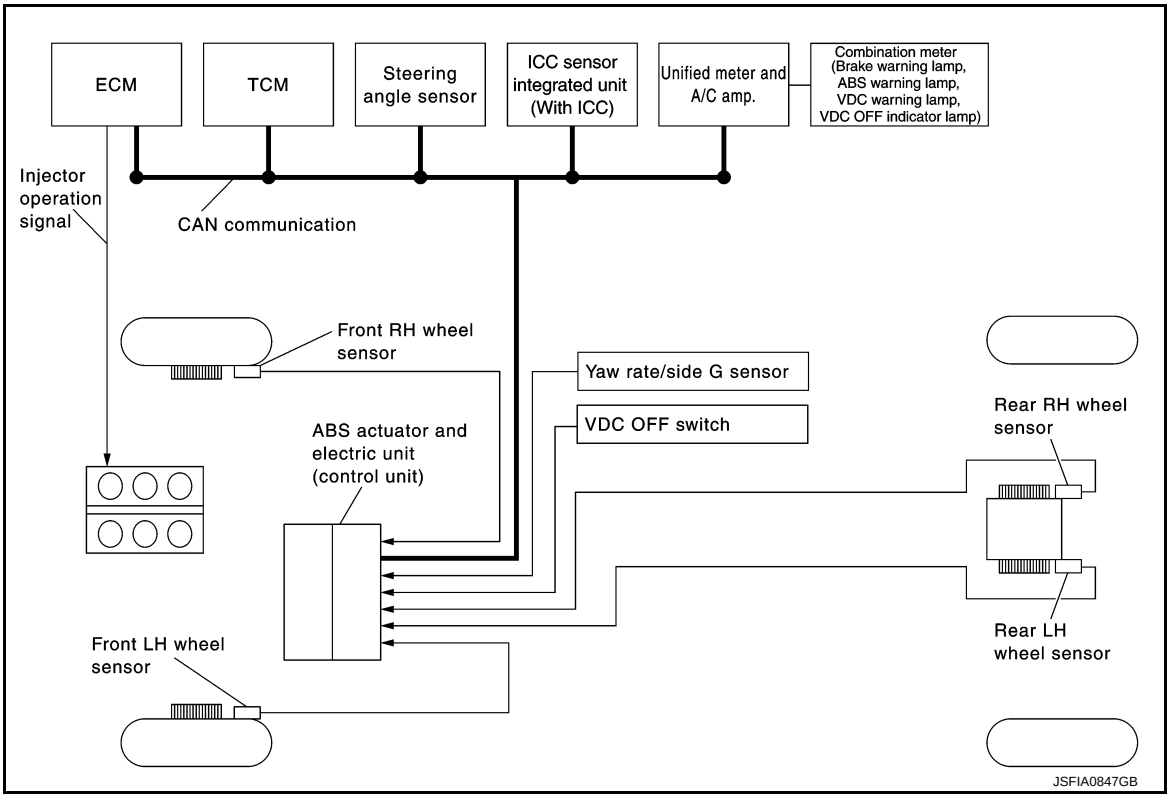
INFOID:0000000006472085

| Component parts | | Reference |
|---|---|---|
| ABS actuator and electric unit (control unit) | Pump | BRC-43, "Description" |
| | Motor | |
| | Actuator relay (main relay) | BRC-60, "Description" |
| | Solenoid valve | BRC-55, "Description", BRC-57, "Description" |
| | Pressure sensor | BRC-62, "Description" |
| | VDC switch-over valve (USV1, USV2, HSV1, HSV2) | BRC-70, "Description" |
| Wheel sensor | | BRC-32, "Description" |
| Yaw rate/side G sensor | | BRC-67, "Description" |
| Steering angle sensor | | BRC-64, "Description" |
| VDC OFF switch | | BRC-85, "Description" |
| ABS warning lamp | | BRC-87, "Description" |
| Brake warning lamp | | BRC-88, "Description" |
| VDC OFF indicator lamp | | BRC-89, "Description" |
| VDC warning lamp | | BRC-90, "Description" |

# TCS

## System Diagram

INFOID:0000000006951138




## System Description

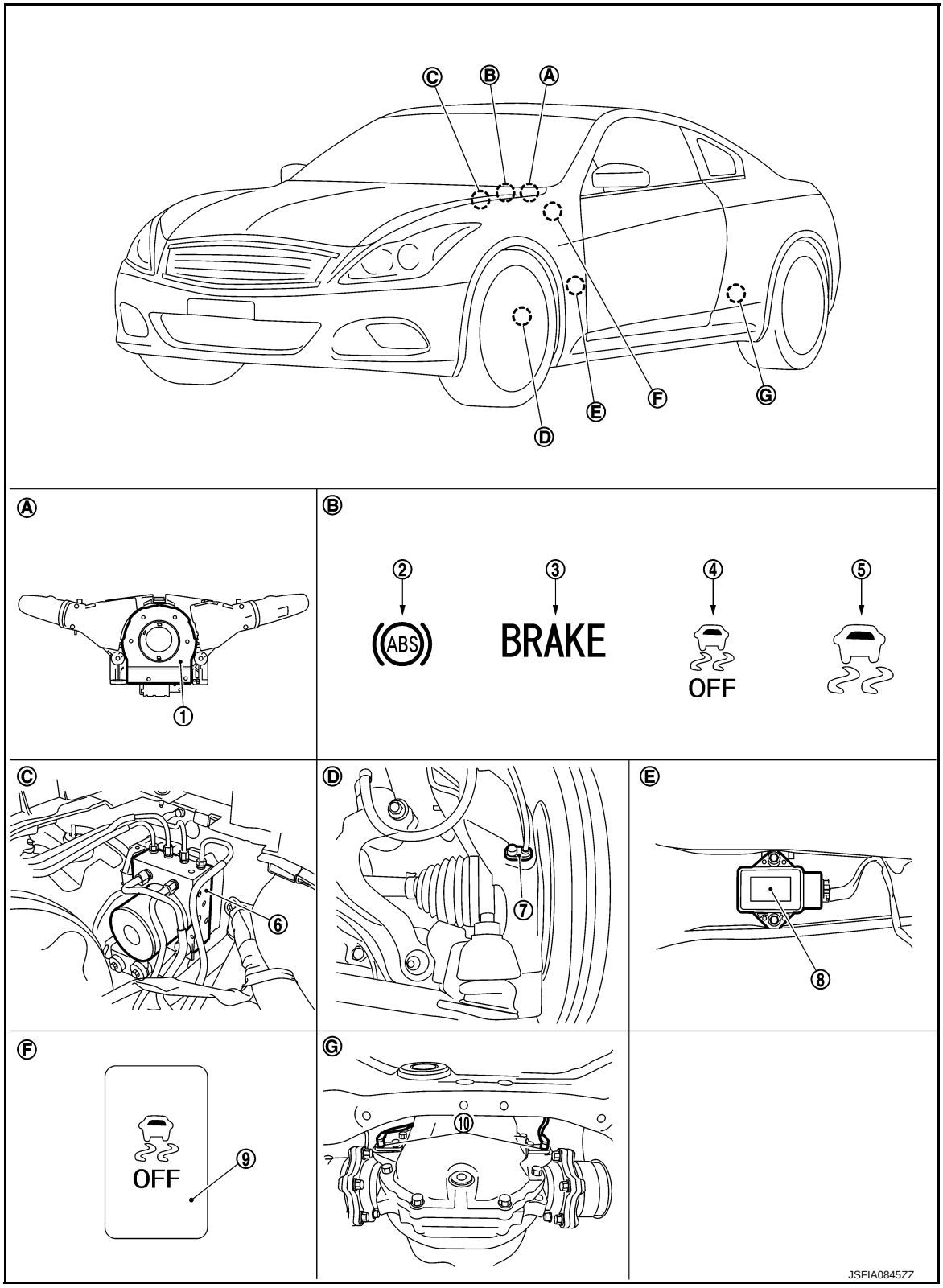
INFOID:0000000006472087

- 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, TCS informs driver of system operation by flashing VDC warning lamp.
- Electrical system diagnosis by CONSULT-III is available.

## Component Parts Location

INFOID:0000000006951139

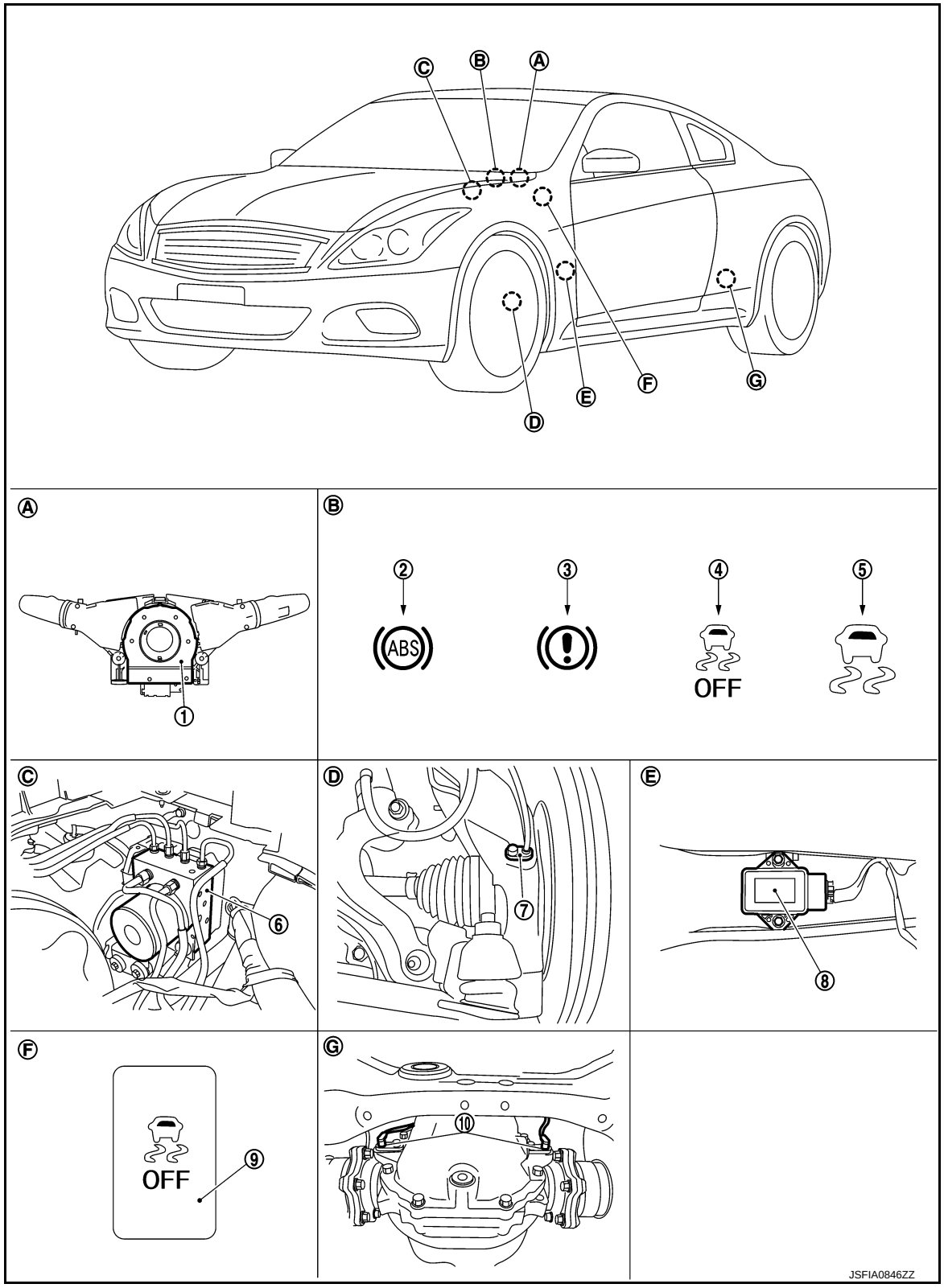
FOR USA




1. Steering angle sensor
2. ABS warning lamp
3. Brake warning lamp
4. VDC OFF indicator lamp
5. VDC warning lamp
6. ABS actuator and electric unit (control unit)
7. Front wheel sensor
8. Yaw rate/side G sensor
9. VDC OFF switch
10. Rear wheel sensor

A. Back of spiral cable assembly
B. Combination meter
C. Inside brake master cylinder cover
D. Steering knuckle
E. Under center console
F. Instrument driver lower panel
G. Rear final drive assembly

FOR CANADA



1. Steering angle sensor
2. ABS warning lamp
3. Brake warning lamp
4. VDC OFF indicator lamp
5. VDC warning lamp
6. ABS actuator and electric unit (control unit)
7. Front wheel sensor
8. Yaw rate/side G sensor
9. VDC OFF switch
10. Rear wheel sensor

A. Back of spiral cable assembly
B. Combination meter
C. Inside brake master cylinder cover
D. Steering knuckle
E. Under center console
F. Instrument driver lower panel
G. Rear final drive assembly

## Component Description

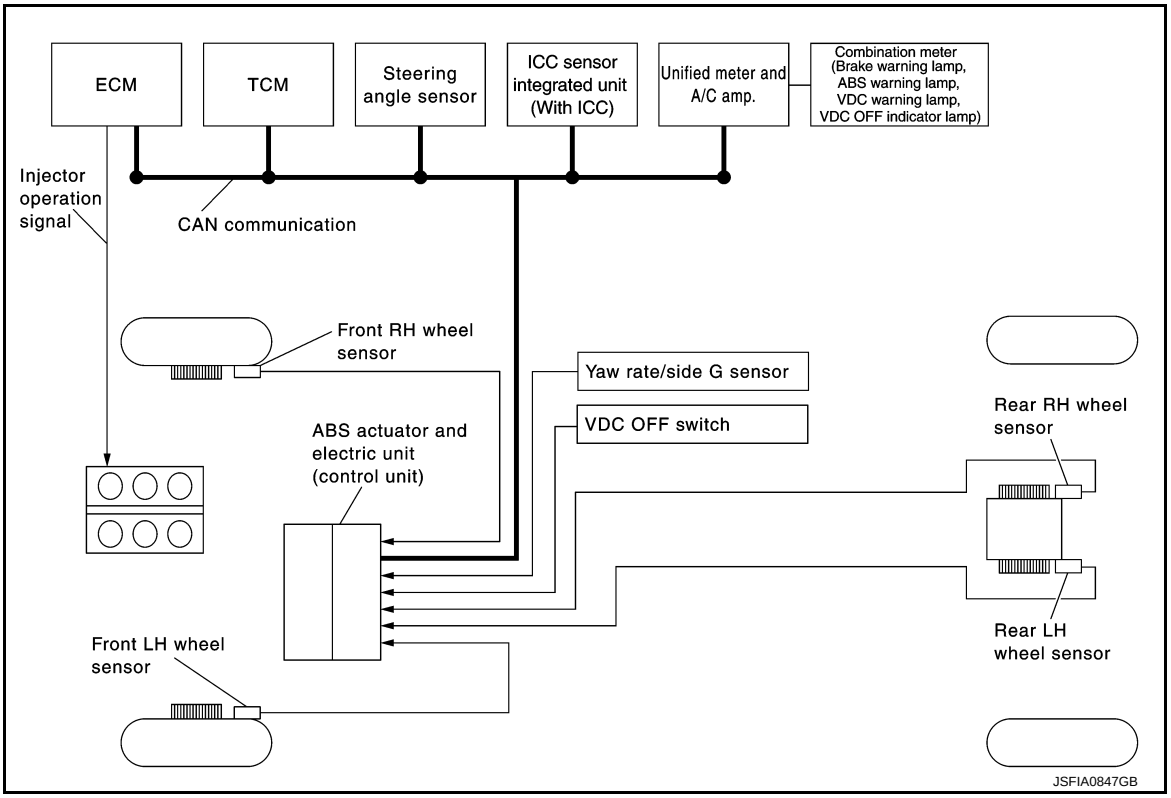
INFOID:0000000006472089

| Component parts | | Reference |
|---|---|---|
| ABS actuator and electric unit (control unit) | Pump | BRC-43, "Description" |
| | Motor | |
| | Actuator relay (main relay) | BRC-60, "Description" |
| | Solenoid valve | BRC-55, "Description", BRC-57, "Description" |
| | Pressure sensor | BRC-62, "Description" |
| | VDC switch-over valve (USV1, USV2, HSV1, HSV2) | BRC-70, "Description" |
| Wheel sensor | | BRC-32, "Description" |
| Yaw rate/side G sensor | | BRC-67, "Description" |
| Steering angle sensor | | BRC-64, "Description" |
| VDC OFF switch | | BRC-85, "Description" |
| ABS warning lamp | | BRC-87, "Description" |
| Brake warning lamp | | BRC-88, "Description" |
| VDC OFF indicator lamp | | BRC-89, "Description" |
| VDC warning lamp | | BRC-90, "Description" |

# ABS

## System Diagram

INFOID:0000000006951140




## System Description

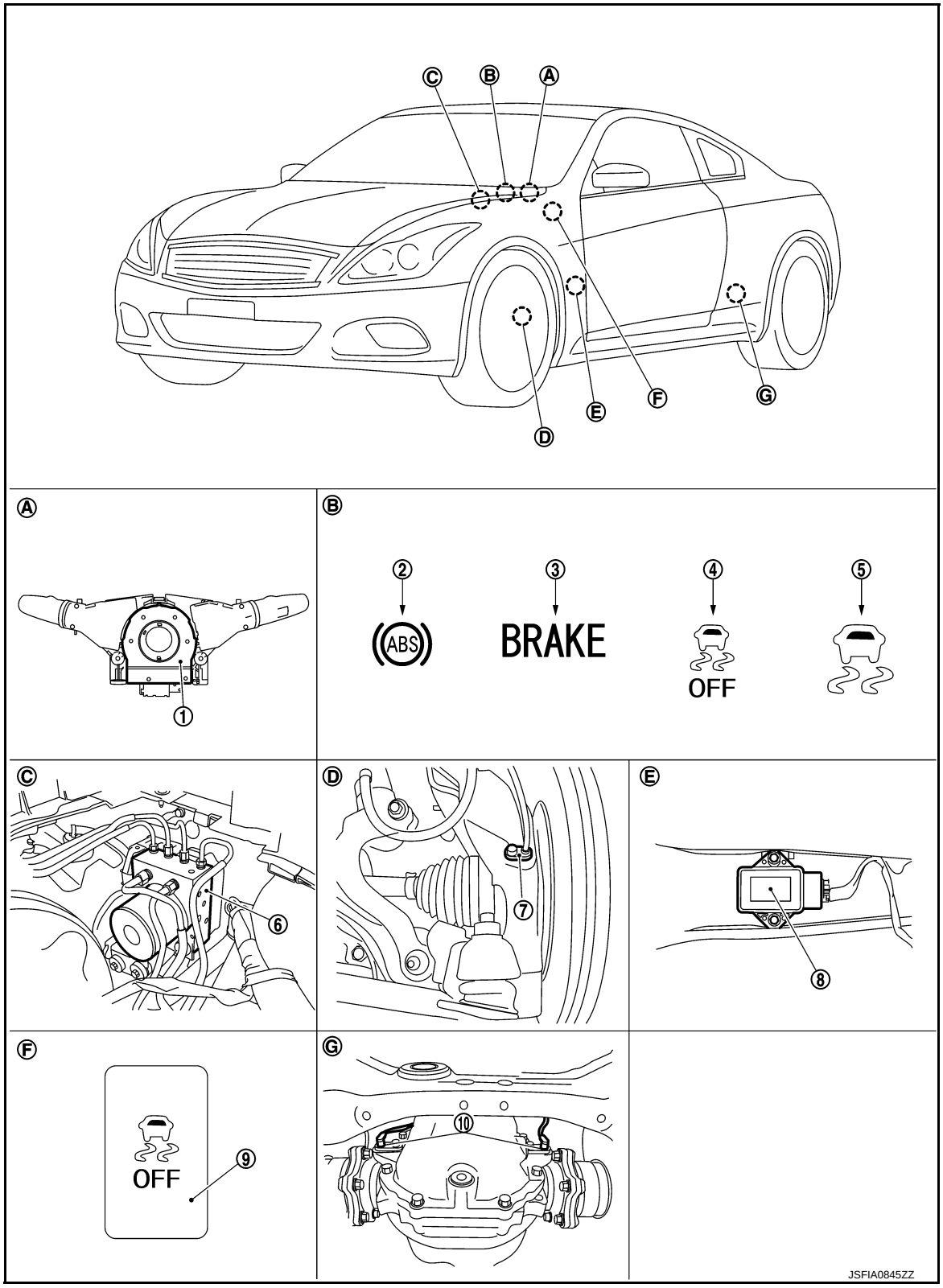
INFOID:0000000006472091

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

## Component Parts Location

INFOID:0000000006951141

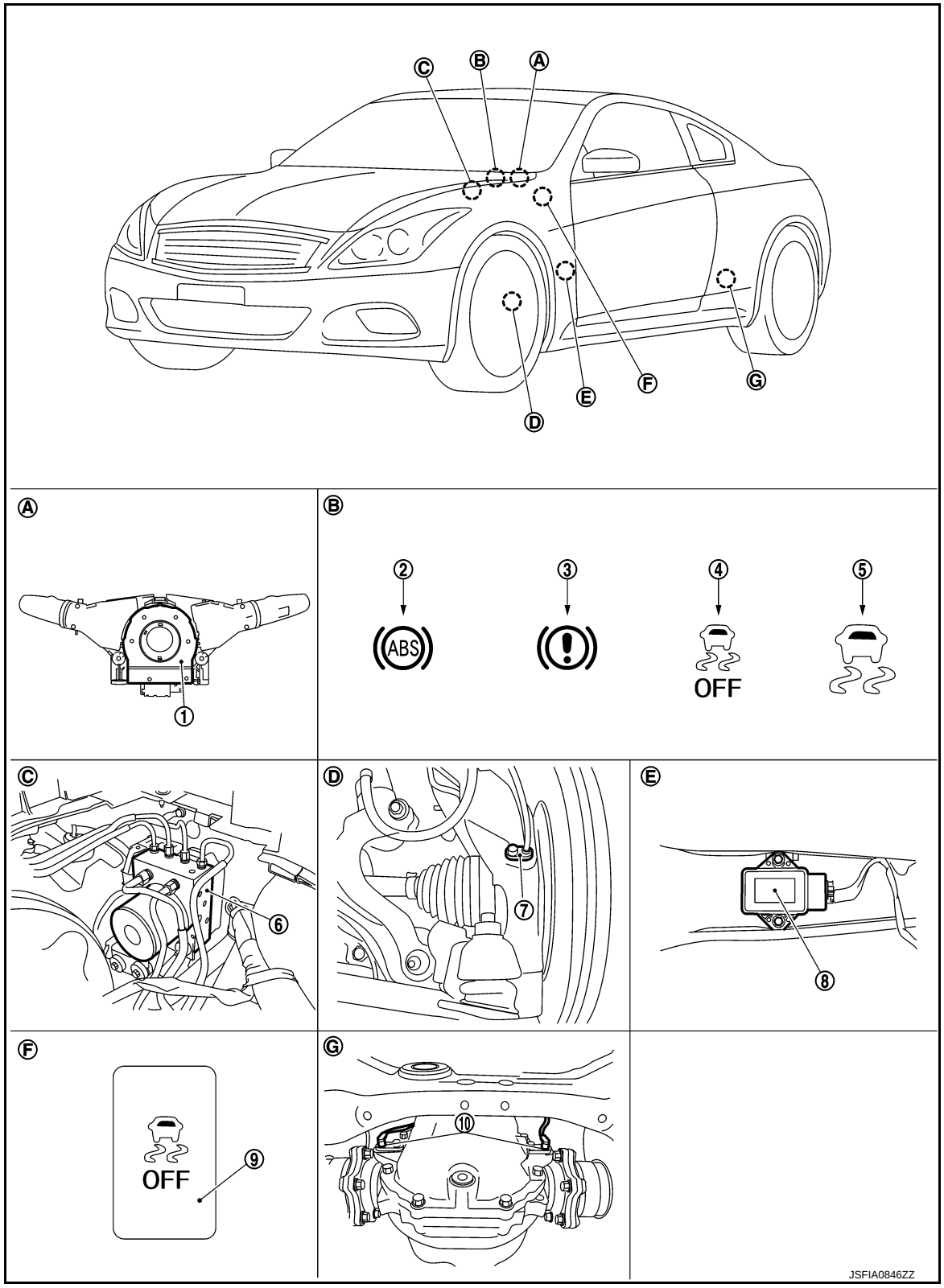
FOR USA




1. Steering angle sensor
2. ABS warning lamp
3. Brake warning lamp
4. VDC OFF indicator lamp
5. VDC warning lamp
6. ABS actuator and electric unit (control unit)
7. Front wheel sensor
8. Yaw rate/side G sensor
9. VDC OFF switch
10. Rear wheel sensor

A. Back of spiral cable assembly
B. Combination meter
C. Inside brake master cylinder cover
D. Steering knuckle
E. Under center console
F. Instrument driver lower panel
G. Rear final drive assembly

FOR CANADA



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9. VDC OFF switch
10. Rear wheel sensor

A. Back of spiral cable assembly
B. Combination meter
C. Inside brake master cylinder cover
D. Steering knuckle
E. Under center console
F. Instrument driver lower panel
G. Rear final drive assembly

## Component Description

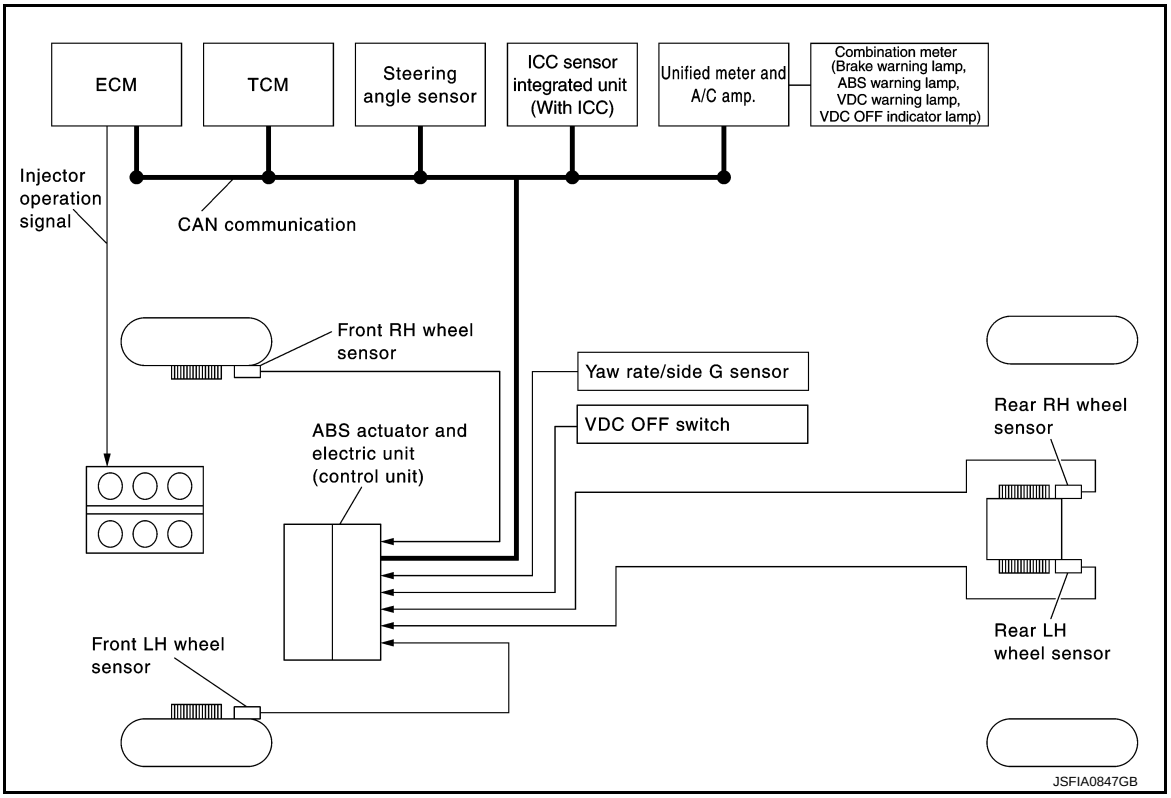
INFOID:0000000006472093

| Component parts | | Reference |
|---|---|---|
| ABS actuator and electric unit (control unit) | Pump | BRC-43, "Description" |
| | Motor | |
| | Actuator relay (main relay) | BRC-60, "Description" |
| | Solenoid valve | BRC-55, "Description", BRC-57, "Description" |
| | Pressure sensor | BRC-62, "Description" |
| | VDC switch-over valve (USV1, USV2, HSV1, HSV2) | BRC-70, "Description" |
| Wheel sensor | | BRC-32, "Description" |
| Yaw rate/side G sensor | | BRC-67, "Description" |
| Steering angle sensor | | BRC-64, "Description" |
| VDC OFF switch | | BRC-85, "Description" |
| ABS warning lamp | | BRC-87, "Description" |
| Brake warning lamp | | BRC-88, "Description" |
| VDC OFF indicator lamp | | BRC-89, "Description" |
| VDC warning lamp | | BRC-90, "Description" |

# EBD

## System Diagram

INFOID:0000000006951142




## System Description

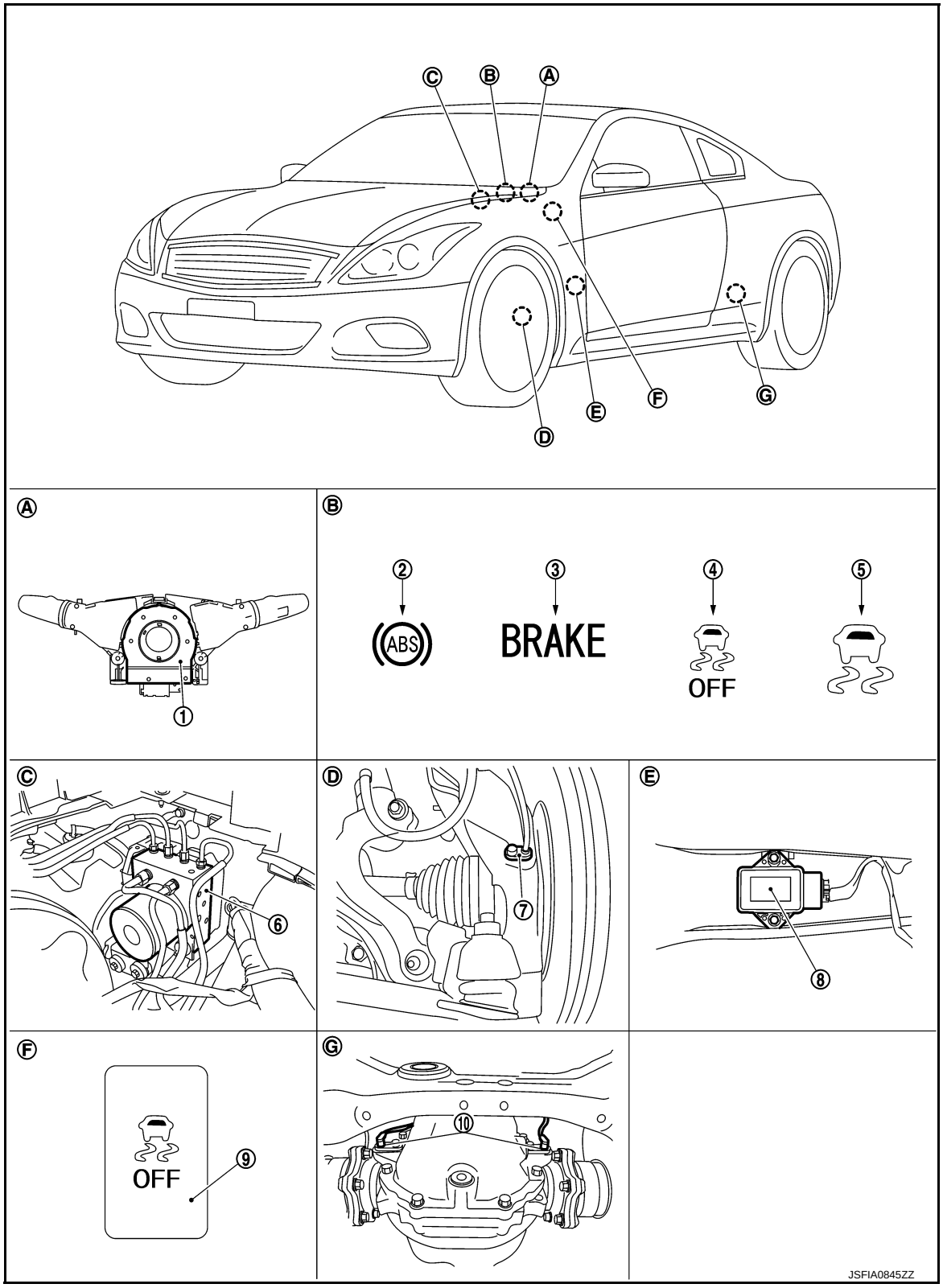
INFOID:0000000006472095

- 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 is electronically controls the rear braking force (brake fluid pressure) to reducing and reduces rear wheel slippage. Accordingly it improves vehicle stability.
- Electrical system diagnosis by CONSULT-III is available.

## Component Parts Location

INFOID:0000000006951143

FOR USA

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9. VDC OFF switch
10. Rear wheel sensor

A. Back of spiral cable assembly
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D. Steering knuckle
E. Under center console
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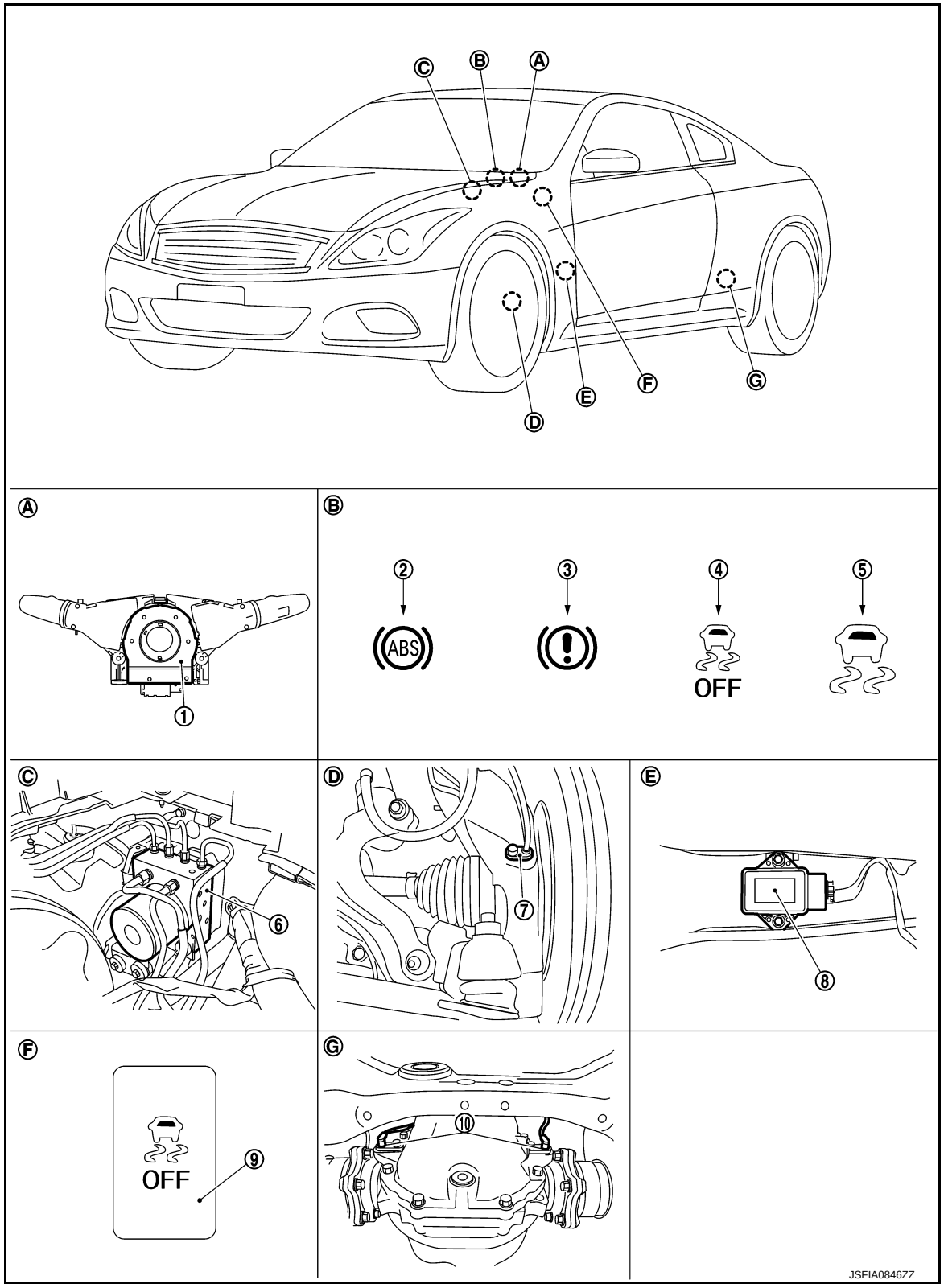
G. Rear final drive assembly

FOR CANADA



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9. VDC OFF switch
10. Rear wheel sensor

A. Back of spiral cable assembly
B. Combination meter
C. Inside brake master cylinder cover
D. Steering knuckle
E. Under center console
F. Instrument driver lower panel
G. Rear final drive assembly

## Component Description

INFOID:0000000006472097

| Component parts | | Reference |
|---|---|---|
| ABS actuator and electric unit (control unit) | Pump | BRC-43, "Description" |
| | Motor | |
| | Actuator relay (main relay) | BRC-60, "Description" |
| | Solenoid valve | BRC-55, "Description", BRC-57, "Description" |
| | Pressure sensor | BRC-62, "Description" |
| | VDC switch-over valve (USV1, USV2, HSV1, HSV2) | BRC-70, "Description" |
| Wheel sensor | | BRC-32, "Description" |
| Yaw rate/side G sensor | | BRC-67, "Description" |
| Steering angle sensor | | BRC-64, "Description" |
| VDC OFF switch | | BRC-85, "Description" |
| ABS warning lamp | | BRC-87, "Description" |
| Brake warning lamp | | BRC-88, "Description" |
| VDC OFF indicator lamp | | BRC-89, "Description" |
| VDC warning lamp | | BRC-90, "Description" |

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

## CONSULT-III Function

INFOID:0000000006472098

### 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 result | 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 | CONSULT-III drives some actuators apart from ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range. |
| ECU identification | ABS actuator and electric unit (control unit) part number can be read. |

### WORK SUPPORT

| Item | Description |
|---|---|
| ST ANGLE SENSOR ADJUSTMENT | Adjusts the neutral position of the steering angle sensor. |

### SELF DIAGNOSTIC RESULT

Operation Procedure

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

Display Item List

Refer to BRC-103, "DTC Index".

How to Erase Self-diagnosis Results

After erasing DTC memory for “ABS” with CONSULT-III, start the engine and drive the 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 warning 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, ABS warning lamp, VDC warning lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driven at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
- Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or in case of brake fluid level switch operation (when brake fluid is insufficient).
- VDC OFF switch should not stay “ON” position.

### DATA MONITOR MODE

Display Item List

×: Applicable ▼: Optional item

| Monitor item (Unit) | SELECT MONITOR ITEM | | Remarks |
|---|---|---|---|
| | ECU INPUT SIGNALS | MAIN SIGNALS | |
| FR LH SENSOR [km/h (MPH)] | × | × | Wheel speed |
| FR RH SENSOR [km/h (MPH)] | × | × | |
| RR LH SENSOR [km/h (MPH)] | × | × | |
| RR RH SENSOR [km/h (MPH)] | × | × | |
| STOP LAMP SW (On/Off) | × | × | Stop lamp switch signal status |
| BATTERY VOLT (V) | × | × | Battery voltage supplied to the ABS actuator and electric unit (control unit) |
| SLCT LVR POSI | × | × | A/T selector lever position |
| OFF SW (On/Off) | × | × | VDC OFF switch |
| YAW RATE SEN (d/s) | × | × | Yaw rate detected by yaw rate/side G sensor |
| ACCEL POS SIG (%) | × | ▼ | Throttle actuator opening/closing is displayed (Linked with accelerator pedal) |
| SIDE G-SENSOR ($m/s^2$) | × | ▼ | Transverse G detected by yaw rate/side G sensor |
| STR ANGLE SIG (°) | × | ▼ | Steering angle detected by steering angle sensor |
| PRESS SENSOR (bar) | × | ▼ | Brake fluid pressure detected by pressure sensor |
| ENGINE RPM [tr/min (rpm)] | × | ▼ | Engine speed |
| FLUID LEV SW (On/Off) | × | ▼ | Brake fluid level switch signal status |
| PARK BRAKE SW (On/Off) | × | ▼ | Parking brake switch signal status |
| FR RH IN SOL (On/Off) (Note 1) | ▼ | × | Operation status of each solenoid valve |
| FR RH OUT SOL (On/Off) (Note 1) | ▼ | × | |
| FR LH IN SOL (On/Off) (Note 1) | ▼ | × | |
| FR LH OUT SOL (On/Off) (Note 1) | ▼ | × | |
| RR RH IN SOL (On/Off) (Note 1) | ▼ | × | |
| RR RH OUT SOL (On/Off) (Note 1) | ▼ | × | |
| RR LH IN SOL (On/Off) (Note 1) | ▼ | × | |
| RR LH OUT SOL (On/Off) (Note 1) | ▼ | × | |
| MOTOR RELAY (On/Off) | ▼ | × | Motor and motor relay operation |

| Monitor item (Unit) | SELECT MONITOR ITEM | | Remarks |
|---|---|---|---|
| | ECU INPUT SIGNALS | MAIN SIGNALS | |
| ACTUATOR RLY (On/Off) (Note 1) | ▼ | × | Actuator relay operation |
| ABS WARN LAMP (On/Off) | ▼ | × | ABS warning lamp |
| OFF LAMP (On/Off) | ▼ | × | VDC OFF indicator lamp |
| SLIP/VDC LAMP (On/Off) | ▼ | × | VDC warning lamp |
| BST IPER SIG | ▼ | ▼ | Not applied but displayed |
| EBD SIGNAL (On/Off) | ▼ | ▼ | EBD operation |
| ABS SIGNAL (On/Off) | ▼ | ▼ | ABS operation |
| TCS SIGNAL (On/Off) | ▼ | ▼ | TCS operation |
| VDC SIGNAL (On/Off) | ▼ | ▼ | VDC operation |
| EBD FAIL SIG (On/Off) | ▼ | ▼ | EBD fail-safe signal |
| ABS FAIL SIG (On/Off) | ▼ | ▼ | ABS fail-safe signal |
| TCS FAIL SIG (On/Off) | ▼ | ▼ | TCS fail-safe signal |
| VDC FAIL SIG (On/Off) | ▼ | ▼ | VDC fail-safe signal |
| CRANKING SIG (On/Off) | ▼ | ▼ | Crank operation |
| USV [FR-RL] (On/Off) | ▼ | ▼ | VDC switch-over valve |
| USV [FL-RR] (On/Off) | ▼ | ▼ | |
| HSV [FR-RL] (On/Off) | ▼ | ▼ | |
| HSV [FL-RR] (On/Off) | ▼ | ▼ | |
| V/R OUTPUT (On/Off) | ▼ | ▼ | Solenoid valve relay activated |
| M/R OUTPUT (On/Off) | ▼ | ▼ | Actuator motor and motor relay activated |

**NOTE:**
A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is a operation for checking.

## ACTIVE TEST MODE

**CAUTION:**
- **Never perform active test while driving vehicle.**
- **Make sure to completely bleed air from brake system.**
- **The active test cannot be started when ABS warning lamp, VDC warning lamp and brake warning lamp are ON.**
- **ABS warning lamp, VDC warning 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.

Test Item

ABS SOLENOID VALVE
- Select “Up”, “Keep” and “Down”. Then use screen monitor to check that solenoid valve operates as shown in the table below.

| Test item | Display item | Display (Note) | | |
|---|---|---|---|---|
| | | Up | Keep | Down |
| FR RH SOL | FR RH IN SOL | Off | On | On |
| | FR RH OUT SOL | Off | Off | On* |
| | USV [FR-RL] | Off | Off | Off |
| | HSV [FR-RL] | Off | Off | Off |
| FR LH SOL | FR LH IN SOL | Off | On | On |
| | FR LH OUT SOL | Off | Off | On* |
| | USV [FL-RR] | Off | Off | Off |
| | HSV [FL-RR] | Off | Off | Off |
| RR RH SOL | RR RH IN SOL | Off | On | On |
| | RR RH OUT SOL | Off | Off | On* |
| | USV [FL-RR] | Off | Off | Off |
| | HSV [FL-RR] | Off | Off | Off |
| RR LH SOL | RR LH IN SOL | Off | On | On |
| | RR LH OUT SOL | Off | Off | On* |
| | USV [FR-RL] | Off | Off | Off |
| | HSV [FR-RL] | Off | Off | Off |

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

**NOTE:**

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

ABS SOLENOID VALVE (ACT)
- Select “Up”, “ACT UP” and “ACT KEEP”. Then use screen monitor to check that solenoid valve operates as shown in the table below.

| Test item | Display item | Display (Note) | | |
|---|---|---|---|---|
| | | Up | ACT UP | ACT KEEP |
| FR RH ABS SOLENOID (ACT) | FR RH IN SOL | Off | Off | Off |
| | FR RH OUT SOL | Off | Off | Off |
| | USV [FR-RL] | Off | On | On |
| | HSV [FR-RL] | Off | On* | Off |
| FR LH ABS SOLENOID (ACT) | FR LH IN SOL | Off | Off | Off |
| | FR LH OUT SOL | Off | Off | Off |
| | USV [FL-RR] | Off | On | On |
| | HSV [FL-RR] | Off | On* | Off |

| Test item | Display item | Display (Note) | | |
|---|---|---|---|---|
| | | Up | ACT UP | ACT KEEP |
| RR RH ABS SOLENOID (ACT) | RR RH IN SOL | Off | Off | Off |
| | RR RH OUT SOL | Off | Off | Off |
| | USV [FL-RR] | Off | On | On |
| | HSV [FL-RR] | Off | On* | Off |
| RR LH ABS SOLENOID (ACT) | RR LH IN SOL | Off | Off | Off |
| | RR LH OUT SOL | Off | Off | Off |
| | USV [FR-RL] | Off | On | On |
| | HSV [FR-RL] | Off | On* | Off |

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

**NOTE:**

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

ABS MOTOR

- Select “On” and “Off” on screen. Make sure motor relay and actuator relay operates as shown in table below.

| Test item | Display item | Display | |
|---|---|---|---|
| | | On | Off |
| ABS MOTOR | MOTOR RELAY | On | Off |
| | ACTUATOR RLY (Note) | On | On |

**NOTE:**

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

## ECU IDENTIFICATION

ABS actuator and electric unit (control unit) part number can be read.

# DTC/CIRCUIT DIAGNOSIS

## C1101, C1102, C1103, C1104 WHEEL SENSOR

### Description

INFOID:0000000006472099

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:0000000006472100

#### 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<br>• Wheel sensor<br>• 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.DTC REPRODUCTION PROCEDURE

1. Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

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

### Diagnosis Procedure

INFOID:0000000006472101

**CAUTION:**
**Never check between wheel sensor harness connector terminals.**

##### 1.CHECK WHEEL SENSOR

1. Turn the ignition switch OFF.
2. Check wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

##### 2.REPLACE WHEEL SENSOR (1)

1. Replace wheel sensor.
- Front: Refer to BRC-115, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-116, "REAR WHEEL SENSOR : Removal and Installation".

2. Erase self-diagnosis result for “ABS”.
3. Turn the ignition switch OFF, and wait 10 seconds or more.
4. Start the engine.
5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
6. Stop the vehicle.
7. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

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

##### 3.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
3. Check wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 4.

## 4. PERFORM SELF-DIAGNOSIS (1)

1. Erase self-diagnosis result for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Start the engine.
4. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
5. Stop the vehicle.
6. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

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

## 5. CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace error-detected parts and GO TO 6.

## 6. PERFORM SELF-DIAGNOSIS (2)

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF, and wait 10 seconds or more.
5. Start the engine.
6. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
7. Stop the vehicle.
8. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

YES >> GO TO 7.
NO >> INSPECTION END

## 7. CHECK WHEEL SENSOR HARNESS

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect wheel sensor harness connector.
4. Check continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

Measurement connector and terminal for power supply circuit

| ABS actuator and electric unit (control unit) | | Wheel sensor | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E41 | 9 | E27 (Front RH) | 1 | Existed |
| | 26 | E60 (Front LH) | | |
| | 7 | B33 (Rear RH) | | |
| | 6 | B34 (Rear LH) | | |

Measurement connector and terminal for signal circuit

| ABS actuator and electric unit (control unit) | | Wheel sensor | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E41 | 10 | E27 (Front RH) | 2 | Existed |
| | 5 | E60 (Front LH) | | |
| | 29 | B33 (Rear RH) | | |
| | 27 | B34 (Rear LH) | | |

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair or replace error-detected parts and GO TO 8.

## 8. PERFORM SELF-DIAGNOSIS (3)

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for “ABS”.
4. Turn the ignition switch OFF, and wait 10 seconds or more.
5. Start the engine.
6. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
7. Stop the vehicle.
8. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

YES >> GO TO 9.
NO >> INSPECTION END

## 9. REPLACE WHEEL SENSOR (2)

1. Replace wheel sensor.
- Front: Refer to BRC-115, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-116, "REAR WHEEL SENSOR : Removal and Installation".
2. Erase self-diagnosis result for “ABS” with CONSULT-III.
3. Turn the ignition switch OFF, and wait 10 seconds or more.
4. Start the engine.
5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
6. Stop the vehicle.
7. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1101”, “C1102”, “C1103” or “C1104” detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> INSPECTION END

# Special Repair Requirement

INFOID:0000000006472102

## 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1105, C1106, C1107, C1108 WHEEL SENSOR

## Description

INFOID:0000000006472103

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:0000000006472104

### 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<br>• Wheel sensor<br>• 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.DTC REPRODUCTION PROCEDURE

1. Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1105”, “C1106”, “C1107”, or “C1108” detected?

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

## Diagnosis Procedure

INFOID:0000000006472105

**CAUTION:**
**Never check between wheel sensor harness connector terminals.**

#### 1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM

Check ABS actuator and electric unit (control unit) power supply system. Refer to BRC-81, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

#### 2.CHECK TIRE

1. Turn the ignition switch OFF.
2. Check tire air pressure, wear and size. Refer to WT-53, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Adjust air pressure or replace tire and GO TO 3.

#### 3.CHECK DATA MONITOR (1)

1. Erase self-diagnosis result for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF, and wait 10 seconds or more.

3. Start the engine.
4. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 4.
NO >> GO TO 5.

## 4. PERFORM SELF-DIAGNOSIS (1)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

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

## 5. CHECK WHEEL SENSOR

1. Turn the ignition switch OFF.
2. Check wheel sensor for damage.
3. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.
   **CAUTION:**
   **Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque.**
   - **Front: Refer to BRC-115, "FRONT WHEEL SENSOR : Exploded View".**
   - **Rear: Refer to BRC-116, "REAR WHEEL SENSOR : Exploded View".**

Is the inspection result normal?

YES >> GO TO 8.
NO >> GO TO 6.

## 6. REPLACE WHEEL SENSOR (1)

1. Replace wheel sensor.
- Front: Refer to BRC-115, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-116, "REAR WHEEL SENSOR : Removal and Installation".
2. Erase self-diagnosis result for “ABS” with CONSULT-III.
3. Turn the ignition switch OFF, and wait 10 seconds or more.
4. Start the engine.
5. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 7.
NO >> GO TO 19.

## 7. PERFORM SELF-DIAGNOSIS (2)

With CONSULT-III.
1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES >> GO TO 19.

NO >> INSPECTION END

## 8. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
3. Check wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 11.
NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 9.

## 9. CHECK DATA MONITOR (2)

1. Erase self-diagnosis result for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Start the engine.
4. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 10.
NO >> GO TO 11.

## 10. PERFORM SELF-DIAGNOSIS (3)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES >> GO TO 11.
NO >> INSPECTION END

## 11. CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.
NO >> Repair or replace error-detected parts and GO TO 12.

## 12. CHECK DATA MONITOR (3)

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for “ABS” with CONSULT-III.
4. Turn the ignition switch OFF, and wait 10 seconds or more.
5. Start the engine.
6. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 13.
NO >> GO TO 14.

## 13. PERFORM SELF-DIAGNOSIS (4)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES >> GO TO 14.
NO >> INSPECTION END

## 14. CHECK WHEEL SENSOR HARNESS

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect wheel sensor harness connector.
4. Check continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

| ABS actuator and electric unit (control unit) | | | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E41 | 9, 10 | E41 | 1, 4 | Not existed |
| | 26, 5 | | | |
| | 7, 29 | | | |
| | 6, 27 | | | |

Is the inspection result normal?

YES >> GO TO 15.
NO >> Repair or replace error-detected parts and GO TO 15.

## 15. CHECK DATA MONITOR (4)

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for “ABS” with CONSULT-III.
4. Turn the ignition switch OFF, and wait 10 seconds or more.
5. Start the engine.
6. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 16.
NO >> GO TO 17.

## 16. PERFORM SELF-DIAGNOSIS (5)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES >> GO TO 17.
NO >> INSPECTION END

## 17. REPLACE WHEEL SENSOR (2)

1. Replace wheel sensor.
- Front: Refer to BRC-115, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-116, "REAR WHEEL SENSOR : Removal and Installation".

2. Erase self-diagnosis result for “ABS” with CONSULT-III.
3. Turn the ignition switch OFF, and wait 10 seconds or more.
4. Start the engine.

5. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 18.
NO >> GO TO 19.

## 18. PERFORM SELF-DIAGNOSIS (6)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES >> GO TO 19.
NO >> INSPECTION END

## 19. REPLACE SENSOR ROTOR

1. Replace sensor rotor.
- Front: Refer to BRC-117, "FRONT SENSOR ROTOR : Exploded View".
- Rear: Refer to BRC-117, "REAR SENSOR ROTOR : Exploded View".
2. Erase self-diagnosis result for “ABS” with CONSULT-III.
3. Turn the ignition switch OFF, and wait 10 seconds or more.
4. Start the engine.
5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
6. Stop the vehicle.
7. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1105”, “C1106”, “C1107” or “C1108” detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> INSPECTION END

# Special Repair Requirement

INFOID:0000000006472106

## 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1109 POWER AND GROUND SYSTEM

## Description

INFOID:0000000006472107

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

## DTC Logic

INFOID:0000000006472108

### 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<br>• ABS actuator and electric unit (control unit)<br>• IPDM E/R |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1109” detected?

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

## Diagnosis Procedure

INFOID:0000000006472109

#### 1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 28 | Ground | Approx. 0 V |

4. Turn the ignition switch ON.
   **CAUTION:**
   **Never start the engine.**
5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 28 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

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

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#45).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R harness connector.

| ABS actuator and electric unit (control unit) | | IPDM E/R | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E41 | 28 | E5 | 25 | Existed |

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-72, "Wiring Diagram - IGNITION POWER SUPPLY -".

NO >> Repair or replace error-detected parts.

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

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 4 | | |

Is the inspection result normal?

YES >> Replace ABS actuator electric unit (control unit). Refer to BRC-118, "Exploded View".

NO >> Repair or replace error-detected parts.

# Special Repair Requirement

INFOID:0000000006472110

## 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

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

## DTC Logic

INFOID:0000000006472111

### DTC DETECTION LOGIC

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

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1110”, “C1153” or “C1170” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-42, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472112

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

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

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".

## Special Repair Requirement

INFOID:0000000006472113

#### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1111 ABS MOTOR, MOTOR RELAY SYSTEM

## Description

INFOID:0000000006472114

### 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).

### MOTOR RELAY

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

## DTC Logic

INFOID:0000000006472115

### 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<br>• 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. DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1111” detected?

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

## Diagnosis Procedure

INFOID:0000000006472116

#### 1. CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check the 50A fuse (M).
4. Check the voltage between the ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 2 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".

#### 2. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 4 | | |

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472117

### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1115 WHEEL SENSOR

## Description

INFOID:0000000006472122

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:0000000006472123

### 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<br>• Wheel sensor<br>• ABS actuator and electric unit (control unit) |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Start the engine and drive the vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1115” detected?

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

## Diagnosis Procedure

INFOID:0000000006472124

**CAUTION:**
**For wheel sensor, never check between terminals.**

#### 1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY SYSTEM

Check ABS actuator and electric unit (control unit) power supply system. Refer to BRC-81, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

#### 2.CHECK TIRE

1. Turn the ignition switch OFF.
2. Check tire air pressure, wear and size. Refer to WT-53, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Adjust air pressure or replace tire and GO TO 3.

#### 3.CHECK DATA MONITOR (1)

1. Erase self-diagnosis result for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Start the engine.
4. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 4.
NO >> GO TO 5.

## 4. PERFORM SELF-DIAGNOSIS (1)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1115” detected?

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

## 5. CHECK WHEEL SENSOR

1. Turn the ignition switch OFF.
2. Check wheel sensor for damage.
3. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.
   **CAUTION:**
   **Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque.**
   - **Front: Refer to BRC-115, "FRONT WHEEL SENSOR : Exploded View".**
   - **Rear: Refer to BRC-116, "REAR WHEEL SENSOR : Exploded View".**

Is the inspection result normal?

YES >> GO TO 8.
NO >> GO TO 6.

## 6. REPLACE WHEEL SENSOR (1)

1. Replace wheel sensor.
- Front: Refer to BRC-115, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-116, "REAR WHEEL SENSOR : Removal and Installation".
2. Erase self-diagnosis result for “ABS” with CONSULT-III.
3. Turn the ignition switch OFF, and wait 10 seconds or more.
4. Start the engine.
5. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 7.
NO >> GO TO 19.

## 7. PERFORM SELF-DIAGNOSIS (2)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1115” detected?

YES >> GO TO 19.
NO >> INSPECTION END

## 8. CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
3. Check wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 11.
NO >> Repair or replace error-detected parts, securely lock the connector, and GO TO 9.

## 9. CHECK DATA MONITOR (2)

1. Erase self-diagnosis result for “ABS” with CONSULT-III.

2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Start the engine.
4. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 10.
NO >> GO TO 11.

## 10. PERFORM SELF-DIAGNOSIS (3)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1115” detected?

YES >> GO TO 11.
NO >> INSPECTION END

## 11. CHECK TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 14.
NO >> Repair or replace error-detected parts and GO TO 12.

## 12. CHECK DATA MONITOR (3)

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for “ABS” with CONSULT-III.
4. Turn the ignition switch OFF, and wait 10 seconds or more.
5. Start the engine.
6. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 13.
NO >> GO TO 14.

## 13. PERFORM SELF-DIAGNOSIS (4)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1115” detected?

YES >> GO TO 14.
NO >> INSPECTION END

## 14. CHECK WHEEL SENSOR HARNESS

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

3. Disconnect wheel sensor harness connector.
4. Check continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check continuity when steering wheel is steered to RH and LH, or center harness in wheel housing is moved.)

Measurement connector and terminal for power supply circuit

| ABS actuator and electric unit (control unit) | | Wheel sensor | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E41 | 9 | E27 (Front RH) | 1 | Existed |
| | 26 | E60 (Front LH) | | |
| | 7 | B33 (Rear RH) | | |
| | 6 | B34 (Rear LH) | | |

Measurement connector and terminal for signal circuit

| ABS actuator and electric unit (control unit) | | Wheel sensor | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E41 | 10 | E27 (Front RH) | 2 | Existed |
| | 5 | E60 (Front LH) | | |
| | 29 | B33 (Rear RH) | | |
| | 27 | B34 (Rear LH) | | |

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

| ABS actuator and electric unit (control unit) | | | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E41 | 9, 10 | E41 | 1, 4 | Not existed |
| | 26, 5 | | | |
| | 7, 29 | | | |
| | 6, 27 | | | |

Is the inspection result normal?

YES >> GO TO 15.
NO >> Repair or replace error-detected parts and GO TO 15.

## 15. CHECK DATA MONITOR (4)

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect wheel sensor harness connector.
3. Erase self-diagnosis result for “ABS” with CONSULT-III.
4. Turn the ignition switch OFF, and wait 10 seconds or more.
5. Start the engine.
6. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 16.
NO >> GO TO 17.

## 16. PERFORM SELF-DIAGNOSIS (5)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1115” detected?

YES >> GO TO 17.

NO >> INSPECTION END

## 17. REPLACE WHEEL SENSOR (2)

1. Replace wheel sensor.
- Front: Refer to BRC-115, "FRONT WHEEL SENSOR : Removal and Installation".
- Rear: Refer to BRC-116, "REAR WHEEL SENSOR : Removal and Installation".
2. Erase self-diagnosis result for “ABS” with CONSULT-III.
3. Turn the ignition switch OFF, and wait 10 seconds or more.
4. Start the engine.
5. Select “ABS” and “DATA MONITOR”, check “FR LH SENSOR”, “FR RH SENSOR”, “RR LH SENSOR” and “RR RH SENSOR” with CONSULT-III.
   **NOTE:**
   Set the “DATA MONITOR” recording speed to “10 msec”.
6. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 18.
NO >> GO TO 19.

## 18. PERFORM SELF-DIAGNOSIS (6)

1. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
2. Stop the vehicle.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1115” detected?

YES >> GO TO 19.
NO >> INSPECTION END

## 19. REPLACE SENSOR ROTOR

1. Replace sensor rotor.
- Front: Refer to BRC-117, "FRONT SENSOR ROTOR : Exploded View".
- Rear: Refer to BRC-117, "REAR SENSOR ROTOR : Exploded View".
2. Erase self-diagnosis result for “ABS”.
3. Turn the ignition switch OFF, and wait 10 seconds or more.
4. Start the engine.
5. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute.
6. Stop the vehicle.
7. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1115” detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> INSPECTION END

# Special Repair Requirement

INFOID:0000000006472125

## 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1116 STOP LAMP SWITCH

## Description

INFOID:0000000006472126

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

## DTC Logic

INFOID:0000000006472127

### DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|---|---|---|---|
| C1116 | STOP LAMP SW | When a stop lamp switch signal is not input where the brake pedal is depressed. | • Harness or connector<br>• Stop lamp switch<br>• ABS actuator and electric unit (control unit) |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1116” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-50, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472128

**NOTE:**
DTC “C1116” may be detected when the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle. This is not a malfunction.

#### 1.INTERVIEW FROM THE CUSTOMER

Check if the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle.

Is there such a history?

YES >> GO TO 2.
NO >> GO TO 3.

#### 2.PERFORM SELF-DIAGNOSIS

1. Erase self-diagnosis result for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Start the engine.
   **CAUTION:**
   **Never start the vehicle.**
4. Depress the brake pedal several times.
5. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1116” detected?

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

#### 3.STOP LAMP FOR ILLUMINATION

Depress brake pedal and check that stop lamp turns ON.

Does stop lamp turn ON?

YES >> GO TO 5.
NO >> Check stop lamp system. Refer to BCS-67, "Wiring Diagram - BCM -". GO TO 4.

#### 4.CHECK DATA MONITOR (1)

1. Erase self-diagnosis result for “ABS” with CONSULT-III.

2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Start the engine.
   **CAUTION:**
   **Never start the vehicle.**
4. Select “ABS”, “DATA MONITOR” and “STOP LAMP SW” according to this order with CONSULT-III. Check that data monitor displays “On” or “Off” when brake pedal is depress or release. Refer to BRC-91, "Reference Value".
5. Select “ABS”, “DATA MONITOR” and “pressure sensor” according to this order. Check that data monitor displays “5 bar” or less when brake pedal is depress. Refer to BRC-91, "Reference Value".

Is the inspection result normal?

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

## 5. CHECK STOP LAMP SWITCH CLEARANCE

1. Turn the ignition switch OFF.
2. Check stop lamp switch clearance. Refer to BR-8, "Inspection and Adjustment".

Is the inspection result normal?

YES >> GO TO 7.
NO >> Adjust stop lamp switch clearance. Refer to BR-8, "Inspection and Adjustment". GO TO 6.

## 6. CHECK DATA MONITOR (2)

1. Erase self-diagnosis result for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Start the engine.
   **CAUTION:**
   **Never start the vehicle.**
4. Select “ABS”, “DATA MONITOR” and “STOP LAMP SW” according to this order with CONSULT-III. Check that data monitor displays “On” or “Off” when brake pedal is depress or release. Refer to BRC-91, "Reference Value".
5. Select “ABS”, “DATA MONITOR” and “pressure sensor” according to this order. Check that data monitor displays “5 bar” or less when brake pedal is depress. Refer to BRC-91, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 7.

## 7. CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to BRC-53, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace stop lamp switch. Refer to BR-19, "Exploded View". GO TO 8.

## 8. CHECK DATA MONITOR (3)

1. Erase self-diagnosis result for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Start the engine.
   **CAUTION:**
   **Never start the vehicle.**
4. Select “ABS”, “DATA MONITOR” and “STOP LAMP SW” according to this order with CONSULT-III. Check that data monitor displays “On” or “Off” when brake pedal is depress or release. Refer to BRC-91, "Reference Value".
5. Select “ABS”, “DATA MONITOR” and “pressure sensor” according to this order. Check that data monitor displays “5 bar” or less when brake pedal is depress. Refer to BRC-91, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 9.

## 9. CHECK CONNECTOR AND TERMINAL

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

3. Check ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
4. Check ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
5. Disconnect stop lamp switch harness connector.
6. Check stop lamp switch harness connector for disconnection or looseness.
7. Check stop lamp switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 11.
NO >> Repair or replace error-detected parts. GO TO 10.

## 10. CHECK DATA MONITOR (4)

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect stop lamp switch harness connector.
3. Erase self-diagnosis result for “ABS” with CONSULT-III.
4. Turn the ignition switch OFF, and wait 10 seconds or more.
5. Start the engine.
   **CAUTION:**
   **Never start the vehicle.**
6. Select “ABS”, “DATA MONITOR” and “STOP LAMP SW” according to this order with CONSULT-III. Check that data monitor displays “On” or “Off” when brake pedal is depress or release. Refer to BRC-91, "Reference Value".
7. Select “ABS”, “DATA MONITOR” and “pressure sensor” according to this order. Check that data monitor displays “5 bar” or less when brake pedal is depress. Refer to BRC-91, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 11.

## 11. CHECK STOP LAMP SWITCH CIRCUIT (1)

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

| ABS actuator and electric unit (control unit) | | — | Condition | Voltage |
|---|---|---|---|---|
| Connector | Terminal | | | |
| E41 | 30 | Ground | Brake pedal depressed | Battery voltage |
| | | | Brake pedal not depressed | Approx. 0 V |

4. Turn the ignition switch ON.
5. Check voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Condition | Voltage |
|---|---|---|---|---|
| Connector | Terminal | | | |
| E41 | 30 | Ground | Brake pedal depressed | Battery voltage |
| | | | Brake pedal not depressed | Approx. 0 V |

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Repair or replace error-detected parts. GO TO 12.

## 12. CHECK STOP LAMP SWITCH CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check continuity between ABS actuator and electric unit (control unit) harness connector and stop lamp switch harness connector.

| ABS actuator and electric unit (control unit) | | Stop lamp switch | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E41 | 30 | E110 | 2*1 | Existed |
| | | | 4*2 | |

*1: With ICC
*2: Without ICC

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 30 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Repair or replace error-detected parts. GO TO 13.

## 13. CHECK DATA MONITOR (5)

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect stop lamp switch harness connector.
3. Erase self-diagnosis result for “ABS” with CONSULT-III.
4. Turn the ignition switch OFF, and wait 10 seconds or more.
5. Start the engine.
   **CAUTION:**
   **Never start the vehicle.**
6. Select “ABS”, “DATA MONITOR” and “STOP LAMP SW” according to this order with CONSULT-III. Check that data monitor displays “On” or “Off” when brake pedal is depress or release. Refer to BRC-91, "Reference Value".
7. Select “ABS”, “DATA MONITOR” and “pressure sensor” according to this order. Check that data monitor displays “5 bar” or less when brake pedal is depress. Refer to BRC-91, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".

# Component Inspection

INFOID:0000000006472129

## 1. CHECK STOP LAMP SWITCH

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

| Stop lamp switch | Condition | Continuity |
|---|---|---|
| Terminal | | |
| 1 – 2 (With ICC)<br>3 – 4 (Without ICC) | Release stop lamp switch<br>(When brake pedal is depressed.) | Existed |
| | Push stop lamp switch<br>(When brake pedal is released.) | Not existed |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace stop lamp switch. Refer to BR-19, "Exploded View".

# Special Repair Requirement

INFOID:0000000006472130

## 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1120, C1122, C1124, C1126 IN ABS SOL

## Description

INFOID:0000000006472131

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:0000000006472132

### 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.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1120”, “C1122”, “C1124” or “C1126” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-55, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472133

#### 1.CHECK SOLENOID POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check the 30A fuse (L).
4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".

#### 2.CHECK SOLENOID GROUND

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 4 | | |

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".

NO >> Repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472134

### 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1121, C1123, C1125, C1127 OUT ABS SOL

## Description

INFOID:0000000006472135

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:0000000006472136

### 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.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1121”, “C1123”, “C1125 ” or “C1127” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-57, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472137

#### 1.CHECK SOLENOID POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check the 30A fuse (L).
4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".

#### 2.CHECK SOLENOID GROUND

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 4 | | |

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".

NO >> Repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472138

### 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1130, C1131, C1132 ENGINE SIGNAL

## Description

INFOID:0000000006472139

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

## DTC Logic

INFOID:0000000006472140

### DTC DETECTION LOGIC

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

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1130”, “C1131” or “C1132”detected?

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

## Diagnosis Procedure

INFOID:0000000006472141

#### 1.PERFORM ECM SELF-DIAGNOSIS

Perform self-diagnosis for “ENGINE” with CONSULT-III.

Is any DTC detected?

YES >> Check the DTC.
NO >> GO TO 2.

#### 2.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

1. Erase self-diagnosis results for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF.
3. Start the engine. Drive the vehicle for a while.
4. Make sure that malfunction indicator lamp (MIL) turns OFF.
5. Stop the engine. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1130” detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Check ABS actuator and electric unit (control unit) harness connector terminals for damage or loose connection with harness connector. If any items and damaged, repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472142

#### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1140 ACTUATOR RELAY SYSTEM

## Description

INFOID:0000000006472118

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

## DTC Logic

INFOID:0000000006472119

### DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|---|---|---|---|
| C1140 | ACTUATOR RLY | During the actuator relay operating with OFF, when the actuator relay turns ON, or when the control line for the relay is shorted to the ground. | • Harness or connector<br>• ABS actuator and electric unit (control unit) |
| | | During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open. | |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1140” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-60, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472120

#### 1.CHECK ACTUATOR RELAY POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check the 30A fuse (L).
4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".

#### 2.CHECK ACTUATOR RELAY GROUND

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 4 | | |

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472121

### 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1142 PRESS SENSOR

## Description

INFOID:0000000006472143

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

## DTC Logic

INFOID:0000000006472144

### 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<br>• Stop lamp switch<br>• ABS actuator and electric unit (control unit) |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1142” detected?

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

## Diagnosis Procedure

INFOID:0000000006472145

#### 1.CHECK STOP LAMP SWITCH

Check stop lamp switch system. Refer to BRC-50, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

#### 2.CHECK BRAKE SYSTEM

1. Check brake fluid leakage: refer to BR-11, "Inspection".
2. Check brake piping: refer to BR-25, "FRONT : Inspection" (front), BR-28, "REAR : Inspection" (rear).
3. Check brake pedal: refer to BR-8, "Inspection and Adjustment".
4. Check master cylinder: refer to BR-13, "Inspection".
5. Check brake booster: refer to BR-14, "Inspection".
6. Check front disc brake: refer to BR-45, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection" (1 piston type), BR-49, "BRAKE CALIPER ASSEMBLY (4 PISTON TYPE) : Inspection" (4 piston type).
7. Check rear disc brake: refer to BR-58, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection" (1 piston type), BR-63, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection" (2 piston type).

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

#### 3.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1142” detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Check ABS actuator and electric unit (control unit) harness connector terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472146

### 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1143 STEERING ANGLE SENSOR

## Description

INFOID:0000000006472147

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:0000000006472148

### DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|---|---|---|---|
| C1143 | ST ANG SEN CIRCUIT | Steering angle sensor is malfunctioning. | • Harness or connector<br>• Steering angle sensor<br>• ABS actuator and electric unit (control unit) |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1143” detected?

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

## Diagnosis Procedure

INFOID:0000000006472149

#### 1.CHECK STEERING ANGLE SENSOR POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect steering angle sensor harness connector.
3. Check the voltage between steering angle sensor harness connector and ground.

| Steering angle sensor | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| M37 | 8 | Ground | Approx. 0 V |

4. Turn the ignition switch ON.
   **CAUTION:**
   **Never start the engine.**
5. Check the voltage between steering angle sensor harness connector and ground.

| Steering angle sensor | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| M37 | 8 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

#### 2.CHECK STEERING ANGLE SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#45).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between steering angle sensor harness connector and IPDM E/R harness connector.

| Steering angle sensor | | IPDM E/R | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M37 | 8 | E5 | 25 | Existed |

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-72, "Wiring Diagram - IGNITION POWER SUPPLY -"

NO >> Repair or replace error-detected parts.

## 3.CHECK STEERING ANGLE SENSOR GROUND

Check the continuity between steering angle sensor harness connector and ground.

| Steering angle sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M37 | 7 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

## 4.CHECK DATA LINE

Check “STRG BRANCH LINE CIRCUIT”. Refer to LAN-50, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".

NO >> Repair or replace error-detected parts. Refer to BRC-113, "Precautions for Harness Repair".

# Special Repair Requirement

INFOID:0000000006472150

## 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

## DTC Logic

INFOID:0000000006472151

### DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|---|---|---|---|
| C1144 | ST ANG SEN SIGNAL | Neutral position of steering angle sensor is not finished. | • Harness or connector<br>• Steering angle sensor<br>• ABS actuator and electric unit (control unit) |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Select “ABS”, “WORK SUPPORT” and “ST ANGLE SENSOR ADJUSTMENT” in order with CONSULT-III, and perform adjust the neutral position of steering angle sensor.
3. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1144” detected?

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

## Diagnosis Procedure

INFOID:0000000006472152

#### 1.CHECK STEERING ANGLE SENSOR

Check steering angle sensor. Refer to BRC-64, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).
NO >> Repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472153

#### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1145, C1146 YAW RATE/SIDE G SENSOR

## Description

INFOID:0000000006472154

The yaw rate/side G sensor detects the yaw rate/side 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:0000000006472155

### DTC DETECTION LOGIC

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

### DTC CONFIRMATION PROCEDURE

#### 1. DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1145” or “C1146” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-67, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472156

**CAUTION:**

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

### INSPECTION PROCEDURE

#### 1. CHECK YAW RATE/SIDE G SENSOR POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect yaw rate/side G sensor harness connector.
3. Check the voltage between yaw rate/side G sensor harness connector and ground.

| Yaw rate/side G sensor | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| M143 | 4 | Ground | Approx. 0 V |

4. Turn the ignition switch ON.
   **CAUTION:**
   **Never start the engine.**
5. Check the voltage between yaw rate/side G sensor harness connector and ground.

| Yaw rate/side G sensor | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| M143 | 4 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

## 2.CHECK YAW RATE/SIDE G SENSOR CIRCUIT

1. Turn the ignition switch OFF.
2. Check the 10 fuse (#45).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between yaw rate/side G sensor harness connector and IPDM E/R harness connector.

| Yaw rate/side G sensor | | IPDM E/R | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M143 | 4 | E5 | 25 | Existed |

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-72, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

## 3.CHECK YAW RATE/SIDE G SENSOR GROUND

Check the continuity between yaw rate/side G sensor harness connector and ground.

| Yaw rate/side G sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M143 | 1 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

## 4.CHECK YAW RATE/SIDE G SENSOR CIRCUIT

Check the continuity between yaw rate/side G sensor harness connector and ABS actuator electric unit (control unit) harness connector.

| Yaw rate/side G sensor | | ABS actuator electric unit (control unit) | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M143 | 2 | E41 | 25 | Existed |
| | 3 | | 45 | |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

## 5.REPLACE YAW RATE/SIDE G SENSOR

1. Replace yaw rate/side G sensor. Refer to BRC-120, "Exploded View".
2. Erase self-diagnosis results for “ABS” with CONSULT-III.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON.
   **CAUTION:**
   **Never start the engine.**
5. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1145” or “C1146” detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> INSPECTION END

# Special Repair Requirement

INFOID:0000000006472157

## 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1147, C1148, C1149, C1150 USV/HSV LINE

## Description

INFOID:0000000006472158

### USV1, USV2 (CUT VALVE)

The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

### HSV1, HSV2 (SUCTION VALVE)

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

## DTC Logic

INFOID:0000000006472159

### DTC DETECTION LOGIC

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

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1147”, “C1148”, “C1149” or “C1150” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-70, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472160

#### 1.CHECK ACTUATOR RELAY POWER SUPPLY

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Check the 30A fuse (L).
4. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 3 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".

#### 2.CHECK ACTUATOR RELAY GROUND

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 4 | | |

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472161

### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1155 BRAKE FLUID LEVEL SWITCH

## Description

INFOID:0000000006472162

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:0000000006472163

### 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<br>• Brake fluid level switch<br>• Combination meter |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1155” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-72, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472164

#### 1.CHECK BRAKE FLUID LEVEL

1. Turn the ignition switch OFF.
2. Check brake fluid level. Refer to BR-11, "Inspection".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Refill brake fluid. Refer to BR-11, "Refilling".

#### 2.PERFORM SELF-DIAGNOSIS (1)

1. Erase self-diagnosis result for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Turn the ignition switch ON.
   **CAUTION:**
   **Never start the engine.**
4. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1155” detected?

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

#### 3.CHECK BRAKE FLUID LEVEL SWITCH

Check brake fluids level switch. Refer to BRC-74, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace reservoir tank. Refer to BR-30, "Exploded View". GO TO 4.

#### 4.PERFORM SELF-DIAGNOSIS (2)

1. Erase self-diagnosis result for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF, and wait 10 seconds or more.
3. Turn the ignition switch ON.
   **CAUTION:**
   **Never start the engine.**
4. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1155” detected?

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

## 5. CHECK CONNECTOR AND TERMINAL

1. Turn the ignition switch OFF.
2. Disconnect brake fluid level switch harness connector.
3. Check brake fluid level switch harness connector for disconnection or looseness.
4. Check brake fluid level switch pin terminals for damage or loose connection with harness connector.
5. Disconnect combination meter harness connector.
6. Check combination meter harness connector for disconnection or looseness.
7. Check combination meter pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace error-detected parts. GO TO 6.

## 6. PERFORM SELF-DIAGNOSIS (3)

1. Connect brake fluid level switch harness connector.
2. Connect combination meter harness connector.
3. Erase self-diagnosis result for “ABS” with CONSULT-III.
4. Turn the ignition switch OFF, and wait 10 seconds or more.
5. Turn the ignition switch ON.
   **CAUTION:**
   **Never start the engine.**
6. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1155” detected?

YES >> INSPECTION END
NO >> GO TO 7.

## 7. CHECK BRAKE FLUID LEVEL SWITCH HARNESS

1. Turn the ignition switch OFF.
2. Disconnect brake fluid level switch harness connector.
3. Disconnect combination meter harness connector.
4. Check continuity between brake fluid level switch harness connector and combination meter harness connector.

| Brake fluid level switch | | Combination meter | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E47 | 1 | M53 | 28 | Existed |

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

| Brake fluid level switch | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E47 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace error-detected parts. GO TO 8.

## 8. CHECK BRAKE FLUID LEVEL SWITCH GROUND

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

| Brake fluid level switch | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E47 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair or replace error-detected parts. GO TO 9.

## 9.CHECK COMBINATION METER

Check combination meter. Refer to MWI-36, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Repair or replace combination meter. Refer to MWI-130, "Exploded View".

# Component Inspection

INFOID:0000000006472165

## 1.CHECK BRAKE FLUID LEVEL SWITCH

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

| Brake fluid level switch | Condition | Continuity |
|---|---|---|
| Terminal | | |
| 1 – 2 | When brake fluid is full in the reservoir tank. | Not existed |
| | When brake fluid is empty in the reservoir tank. | Existed |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace reservoir tank. Refer to BR-30, "Exploded View".

# Special Repair Requirement

INFOID:0000000006472166

## 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1185 ICC UNIT

## Description

INFOID:0000000006472167

The ABS actuator and electric unit (control unit) and the ICC sensor integrated unit exchange signals via the CAN communication line.

## DTC Logic

INFOID:0000000006472168

### DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|---|---|---|---|
| C1185 | ACC CONT | ICC sensor integrated unit internal malfunction. | • Harness or connector<br>• ICC sensor integrated unit<br>• ABS actuator and electric unit (control unit)<br>• CAN communication line |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1185” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-75, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472169

#### 1.PERFORM ICC INTEGRATED UNIT SELF DIAGNOSIS

Perform self-diagnosis for “ICC” with CONSULT-III.

Is any DTC detected?

YES >> Check the DTC.
NO >> GO TO 2.

#### 2.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF DIAGNOSIS

1. Erase self-diagnosis results for “ABS” with CONSULT-III.
2. Turn the ignition switch OFF.
3. Start the engine. Drive the vehicle for a while.
4. Make sure that malfunction indicator lamp (MIL) turns OFF.
5. Stop the engine. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1185” detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Check ABS actuator and electric unit (control unit) harness connector terminals for damage or loose connection with harness connector. If any items and damaged, repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472170

#### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1198 VACUUM SENSOR

## Description

INFOID:0000000006472171

The brake booster pressure sensor of engine converts the vacuum pressure to an electric signal and transmits it to the ABS actuator and electric unit (control unit) by CAN.

## DTC Logic

INFOID:0000000006472172

### DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|---|---|---|---|
| C1198 | VACUUM SEN CIR | When the ECM detects a malfunction of brake booster pressure sensor. | • ECM<br>• Brake booster pressure sensor |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1198” detected?

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

## Diagnosis Procedure

INFOID:0000000006472173

#### 1.CHECK THE ECM

1. Check the DTC “P0555” display with the self-diagnosis function of “ENGINE” with CONSULT-III, and repair or replace error-detected parts. Refer to EC-374, "Diagnosis Procedure".
2. After repair or replace, erase self-diagnosis results for “ENGINE” and “ABS” with CONSULT-III.

- “ENGINE”: refer to EC-127, "Diagnosis Description".
- “ABS”: refer to BRC-27, "CONSULT-III Function".

3. Perform the self-diagnosis again, and check that the malfunction is repaired completely.

>> INSPECTION END

## Special Repair Requirement

INFOID:0000000006472174

#### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# C1199 BRAKE BOOSTER

## Description

INFOID:0000000006472175

The brake booster pressure sensor of engine converts the vacuum pressure to an electric signal and transmits it to the ABS actuator and electric unit (control unit) by CAN.

## DTC Logic

INFOID:0000000006472176

### DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|---|---|---|---|
| C1199 | BRAKE BOOSTER | When the ECM detects a malfunction of brake booster. | • ECM<br>• Brake booster pressure sensor<br>• Brake booster<br>• Vacuum hose |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “C1199” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-77, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472177

#### 1.CHECK BRAKE BOOSTER AND VACUUM HOSE

Check brake booster and vacuum hose.
- Brake booster: Refer to BR-34, "Inspection and Adjustment".
- Vacuum hose: Refer to BR-36, "Inspection".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace brake booster or vacuum hose.
- Brake booster: Refer to BR-33, "Exploded View".
- Vacuum hose: Refer to BR-36, "Exploded View".

#### 2.CHECK THE ECM

1. Check the DTC “P0555” display with the self-diagnosis function of “ENGINE” with CONSULT-III, and repair or replace error-detected parts. Refer to EC-374, "Diagnosis Procedure".
2. After repair or replace, erase self-diagnosis results for “ENGINE” and “ABS” with CONSULT-III.

- “ENGINE”: refer to EC-127, "Diagnosis Description".
- “ABS”: refer to BRC-27, "CONSULT-III Function".

3. Perform the self-diagnosis again, and check that the malfunction is repaired completely.

>> INSPECTION END

## Special Repair Requirement

INFOID:0000000006472178

#### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# U1000 CAN COMM CIRCUIT

## Description

INFOID:0000000006472179

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:0000000006472180

### 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<br>• ABS actuator and electric unit (control unit) |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “U1000” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-78, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000006472181

#### 1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “U1000” detected?

YES >> Proceed to diagnosis procedure. Refer to LAN-14, "Trouble Diagnosis Flow Chart".
NO >> INSPECTION END

## Special Repair Requirement

INFOID:0000000006472182

#### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# U1002 SYSTEM COMM (CAN)

## Description

INFOID:0000000006472183

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:0000000006472184

### DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|---|---|---|---|
| U1002 | SYSTEM COMM (CAN) | When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or less. | • CAN communication line<br>• ABS actuator and electric unit (control unit) |

### DTC CONFIRMATION PROCEDURE

#### 1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “ABS” with CONSULT-III.

Is DTC “U1002” detected?

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

## Diagnosis Procedure

INFOID:0000000006472185

**CAUTION:**
- **Never apply 7.0 V or more to the measurement terminal.**
- **Use a tester with open terminal voltage of 7.0 V or less.**
- **Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness.**

#### 1.CHECK CAN DIAGNOSIS SUPPORT MONITOR

1. Select “ABS” and “CAN Diagnosis Support Monitor” in order with CONSULT-III.
2. Check malfunction history between each control unit connected to ABS actuator and electric unit (control unit).

Check the result of “PAST”?

All items are “OK”>>Check intermittent incident. Refer to GI-43, "Intermittent Incident".
“TRANSMIT DIAG” is other than “OK”>>GO TO 2.
A control unit other than ABS actuator and electric unit (control unit) is anything other than “OK”>>GO TO 3.

#### 2.CHECK TRANSMITTING SIDE UNIT

Check the ABS actuator and electric unit (control unit) harness connector terminals No. 14 and 35 for damage or loose connection.

Is the inspection result normal?

YES >> Erase self-diagnosis results. Then perform self-diagnosis for “ABS” with CONSULT-III.
NO >> Recheck terminals for damage or loose connection. Refer to LAN-4, "Precautions for Harness Repair".

#### 3.CHECK APPLICABLE CONTROL UNIT

Check terminals of each CAN communication line harness connector for damage or loose connection.

Is the inspection result normal?

YES >> Erase self-diagnosis results. Then perform self-diagnosis for applicable control unit with CONSULT-III.

NO >> Recheck terminals for damage or loose connection. Refer to LAN-4, "Precautions for Harness Repair".

## Special Repair Requirement

INFOID:0000000006472186

### 1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# POWER SUPPLY AND GROUND CIRCUIT

## Description

INFOID:0000000006472187

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

## Diagnosis Procedure

INFOID:0000000006472188

### 1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) IGNITION POWER SUPPLY

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

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 28 | Ground | Approx. 0 V |

4. Turn the ignition switch ON.
   **CAUTION:**
   **Never start the engine.**
5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 28 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

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

1. Check the 10A fuse (#45).
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R harness connector.

| ABS actuator and electric unit (control unit) | | IPDM E/R | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E41 | 28 | E5 | 25 | Existed |

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 28 | Ground | No existed |

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-72, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

### 3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY

1. Turn the ignition switch OFF.
2. Check the 50A fuse (M) and 30A fuse (L).
3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | — | Voltage |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 2 | Ground | Battery voltage |
| | 3 | | |

Is the inspection result normal?

YES >> GO TO 4.
NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to PG-6, "Wiring Diagram - BATTERY POWER SUPPLY -".

## 4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND

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

| ABS actuator and electric unit (control unit) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E41 | 1 | Ground | Existed |
| | 4 | | |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

# PARKING BRAKE SWITCH

## Description

INFOID:0000000006472189

Operate the parking brake lever (M/T) or parking brake pedal (A/T), and brake warning lamp in the combination meter turns ON/OFF correctly.

## Diagnosis Procedure

INFOID:0000000006472190

### 1.CHECK PARKING BRAKE SWITCH CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect parking brake switch harness connector.
3. Disconnect combination meter harness connector.
4. Check the continuity between parking brake switch harness connector and combination meter harness connector.

| Parking brake switch | | Combination meter | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M68 | 1 | M53 | 26 | Existed |

| Parking brake switch | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M68 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

### 2.CHECK PARKING BRAKE SWITCH

Check the continuity between parking brake switch. Refer to BRC-84, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace parking brake switch. Refer to PB-6, "PEDAL TYPE : Exploded View" (pedal type), PB-7, "LEVER TYPE : Exploded View" (lever type).

### 3.CHECK CONNECTOR

Check the connector and terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

### 4.CHECK PARKING BRAKE SWITCH SIGNAL

Select “ABS”, “DATA MONITOR” and “PARK BRAKE SW” in order with CONSULT-III, and perform the parking brake switch inspection.

| Condition | PARK BRAKE SW (DATA MONITOR) |
|---|---|
| Parking brake lever (M/T) or parking brake pedal (A/T) is active | On |
| Parking brake lever (M/T) or parking brake pedal (A/T) is inactive | Off |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check combination meter. Refer to MWI-34, "Diagnosis Description".

## Component Inspection

INFOID:0000000006472191

### 1. CHECK PARKING BRAKE SWITCH

1. Turn the ignition switch OFF.
2. Disconnect parking brake switch harness connector.
3. Check the continuity between parking brake switch harness connector.

| Parking brake switch Terminal | — | Condition | Continuity |
|---|---|---|---|
| 1 | Ground | When the parking brake switch is operated. | Existed |
| | | When the parking brake switch is not operated. | Not existed |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace parking brake switch. Refer to PB-6, "PEDAL TYPE : Exploded View" (pedal type), PB-7, "LEVER TYPE : Exploded View" (lever type).

# VDC OFF SWITCH

## Description

INFOID:0000000006472192

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

## Diagnosis Procedure

INFOID:0000000006472193

### 1.CHECK VDC OFF SWITCH CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector.
3. Disconnect VDC OFF switch harness connector.
4. Check the continuity between VDC OFF switch harness connector and ABS actuator and electric unit (control unit) harness connector.

| ABS actuator and electric unit (control unit) | | VDC OFF switch | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E41 | 31 | M19 | 1 | Existed |

5. Check the continuity between VDC OFF switch harness connector and ground.

| VDC OFF switch | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M19 | 1 | Ground | Not existed |
| | 2 | | Existed |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

### 2.CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to BRC-86, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace VDC OFF switch. Refer to BRC-122, "Removal and Installation".

### 3.CHECK CONNECTOR

1. Disconnect combination meter harness connector.
2. Check connector and terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

### 4.CHECK VDC OFF SWITCH SIGNAL

Select “ABS”, “DATA MONITOR” and “OFF SW” in order with CONSULT-III, and perform the VDC OFF switch inspection.

| Condition | OFF SW (DATA MONITOR) |
|---|---|
| Press the VDC OFF switch when VDC OFF indicator lamp is OFF. | On |
| Press the VDC OFF switch when VDC OFF indicator lamp is ON. | Off |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".

## Component Inspection

INFOID:0000000006472194

### 1.CHECK VDC OFF SWITCH

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

| VDC OFF switch Terminal | Condition | Continuity |
|---|---|---|
| 1 – 2 | When VDC OFF switch is hold pressed. | Existed |
| | When releasing VDC OFF switch. | Not existed |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace VDC OFF switch. Refer to BRC-122, "Removal and Installation".

## Special Repair Requirement

INFOID:0000000006472195

### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# ABS WARNING LAMP

## Description

INFOID:0000000006472196

×: ON –: OFF

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

## Component Function Check

INFOID:0000000006472197

### 1.CHECK ABS WARNING LAMP OPERATION

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

Is the inspection result normal?

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

## Diagnosis Procedure

INFOID:0000000006472198

### 1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for “ABS” with CONSULT-III.

Is any DTC detected?

YES >> Check the DTC.
NO >> GO TO 2.

### 2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-34, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472199

### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# BRAKE WARNING LAMP

## Description

INFOID:0000000006472200

×: ON –: OFF

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

**NOTE:**

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

## Component Function Check

INFOID:0000000006472201

### 1.BRAKE WARNING LAMP OPERATION CHECK 1

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Proceed to diagnosis procedure. Refer to BRC-88, "Diagnosis Procedure".

### 2.BRAKE WARNING LAMP OPERATION CHECK 2

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check parking brake switch. Refer to BRC-84, "Component Inspection".

## Diagnosis Procedure

INFOID:0000000006472202

### 1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for “ABS” with CONSULT-III.

Is any DTC detected?

YES >> Check the DTC.
NO >> GO TO 2.

### 2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-34, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472203

### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# VDC OFF INDICATOR LAMP

## Description

INFOID:0000000006472204

×: ON –: OFF

| Condition | VDC OFF indicator lamp |
|---|---|
| Ignition switch OFF | – |
| For 1 seconds after turning ignition switch ON | × |
| 1 seconds later after turning ignition switch ON | – |
| 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:0000000006472205

### 1.VDC OFF INDICATOR LAMP OPERATION CHECK 1

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Proceed to diagnosis procedure. Refer to BRC-89, "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-86, "Component Inspection".

## Diagnosis Procedure

INFOID:0000000006472206

### 1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for “ABS” with CONSULT-III.

Is any DTC detected?

YES >> Check the DTC.
NO >> GO TO 2.

### 2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-34, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472207

### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# VDC WARNING LAMP

## Description

INFOID:0000000006472208

×: ON △: Blink –: OFF

| Condition | VDC warning lamp |
|---|---|
| Ignition switch OFF | – |
| For 1 seconds after turning ignition switch ON | × |
| 1 seconds later after turning ignition switch ON | – |
| VDC/TCS is activated while driving | △ |
| VDC/TCS function is malfunctioning. | × |
| ABS function is malfunctioning. | × |
| EBD function is malfunctioning. | × |

## Component Function Check

INFOID:0000000006472209

### 1.CHECK VDC WARNING LAMP OPERATION

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

Is the inspection result normal?

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

## Diagnosis Procedure

INFOID:0000000006472210

### 1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis for “ABS” with CONSULT-III.

Is any DTC detected?

YES >> Check the DTC.
NO >> GO TO 2.

### 2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-34, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".
NO >> Repair or replace error-detected parts.

## Special Repair Requirement

INFOID:0000000006472211

### 1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit) or steering angle sensor and removing steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"

>> END

# ECU DIAGNOSIS INFORMATION

## ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

### Reference Value

INFOID:0000000006472212

VALUES ON THE DIAGNOSIS TOOL

**CAUTION:**

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

| Monitor item | Display content | Data monitor | |
|---|---|---|---|
| | | Condition | Reference value in normal operation |
| FR LH SENSOR | Wheel speed | Vehicle stopped | 0 [km/h (MPH)] |
| | | Vehicle running (Note 1) | Nearly matches the speedometer display (± 10% or less) |
| FR RH SENSOR | Wheel speed | Vehicle stopped | 0 [km/h (MPH)] |
| | | Vehicle running (Note 1) | Nearly matches the speedometer display (± 1% or less) |
| RR LH SENSOR | Wheel speed | Vehicle stopped | 0 [km/h (MPH)] |
| | | Vehicle running (Note 1) | Nearly matches the speedometer display (± 10% or less) |
| RR RH SENSOR | Wheel speed | Vehicle stopped | 0 [km/h (MPH)] |
| | | Vehicle running (Note 1) | Nearly matches the speedometer display (± 10% or less) |
| STOP LAMP SW | Stop lamp switch signal status | When brake pedal is depressed | On |
| | | When brake pedal is not depressed | Off |
| BATTERY VOLT | Battery voltage supplied to the ABS actuator and electric unit (control unit) | Ignition switch ON | 10 – 16 V |
| SLCT LVR POSI | A/T selector lever position | P position<br>R position<br>N position<br>D position | P<br>R<br>N<br>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 OF) | Off |
| YAW RATE SEN | Yaw rate detected by yaw rate/side G sensor | Vehicle stopped | Approx. 0 d/s |
| | | Turning right | Negative value |
| | | Turning left | Positive value |
| ACCEL POS SIG | Throttle actuator opening/closing is displayed (linked with accelerator pedal) | Accelerator pedal not depressed (ignition switch is ON) | 0 % |
| | | Depress accelerator pedal (ignition switch is ON) | 0 - 100 % |
| SIDE G-SENSOR | Transverse G detected by side G sensor | Vehicle stopped | Approx. 0 $m/s^2$ |
| | | Turning right | Negative value |
| | | Turning left | Positive value |

| Monitor item | Display content | Data monitor | |
|---|---|---|---|
| | | Condition | Reference value in normal operation |
| STR ANGLE SIG | Steering angle detected by steering angle sensor | Driving straight | ±2.5° |
| | | Turn 90° to right | Approx. +90° |
| | | Turn 90° to left | Approx. −90° |
| PRESS SENSOR | Brake fluid pressure detected by pressure sensor | With ignition switch turned ON and brake pedal released | Approx. 0 bar |
| | | With ignition switch turned ON and brake pedal depressed | –40 to 300 bar |
| ENGINE RPM | With engine running | With engine stopped | 0 [tr/min (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 |
| PARK BRAKE SW | Parking brake switch signal status | Parking brake switch is active | On |
| | | Parking brake switch is inactive | Off |
| FR RH IN SOL | Operation status of each solenoid valve | Actuator (solenoid valve) is active (“ACTIVE TEST” in “ABS” with CONSULT-III) | 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” in “ABS” with CONSULT-III) | 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” in “ABS” with CONSULT-III) | 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” in “ABS” with CONSULT-III) | 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” in “ABS” with CONSULT-III) | On |
| | | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off |
| RR RH OUT SOL | Operation status of each solenoid valve | Actuator (solenoid valve) is active (“ACTIVE TEST” in “ABS” with CONSULT-III) | 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” in “ABS” with CONSULT-III) | On |
| | | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off |

| Monitor item | Display content | Data monitor | |
|---|---|---|---|
| | | Condition | Reference value in normal operation |
| RR LH OUT SOL | Operation status of each solenoid valve | Actuator (solenoid valve) is active (“ACTIVE TEST” in “ABS” with CONSULT-III) | On |
| | | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off |
| MOTOR RELAY | Motor and motor relay operation | When the motor relay and motor are operating | On |
| | | When the motor relay and motor are not operating | Off |
| ACTUATOR RLY (Note 2) | Actuator relay operation | When the actuator relay is operating | On |
| | | When the actuator relay is not operating | Off |
| ABS WARN LAMP | ABS warning lamp (Note 3) | When ABS warning lamp is ON | On |
| | | When ABS warning lamp is OFF | Off |
| OFF LAMP | VDC OFF indicator lamp (Note 3) | When VDC OFF indicator lamp is ON | On |
| | | When VDC OFF indicator lamp is OFF | Off |
| SLIP/VDC LAMP | VDC warning lamp (Note 3) | When VDC warning lamp is ON | On |
| | | When VDC warning lamp is OFF | 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 |
| TCS FAIL SIG | TCS fail-safe signal | In TCS fail-safe | On |
| | | TCS is normal | Off |
| VDC FAIL SIG | VDC fail-safe signal | In VDC fail-safe | On |
| | | VDC is normal | Off |
| CRANKING SIG | Crank operation | Crank is active | On |
| | | Crank is inactive | Off |
| USV [FL-RR] (Note 2) | VDC switch-over valve | When actuator (switch-over valve) is active (“ACTIVE TEST” in “ABS” with CONSULT-III) | On |
| | | When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON) | Off |

| Monitor item | Display content | Data monitor | |
|---|---|---|---|
| | | Condition | Reference value in normal operation |
| USV [FR-RL] (Note 2) | VDC switch-over valve | When actuator (switch-over valve) is active (“ACTIVE TEST” in “ABS” with CONSULT-III) | On |
| | | When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON) | Off |
| HSV [FL-RR] (Note 2) | VDC switch-over valve | When actuator (switch-over valve) is active (“ACTIVE TEST” in “ABS” with CONSULT-III) | On |
| | | When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON) | Off |
| HSV [FR-RL] (Note 2) | VDC switch-over valve | When actuator (switch-over valve) is active (“ACTIVE TEST” in “ABS” with CONSULT-III) | On |
| | | When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON) | Off |
| V/R OUTPUT (Note 2) | Solenoid valve relay activated | When the solenoid valve relay is active (When ignition switch OFF) | On |
| | | When the solenoid valve relay is not active (in the fail-safe mode) | Off |
| M/R OUTPUT | Actuator motor and motor relay activated | When the actuator motor and motor relay are active (“ACTIVE TEST” in “ABS” with CONSULT-III) | On |
| | | When the actuator motor and motor relay are inactive | Off |

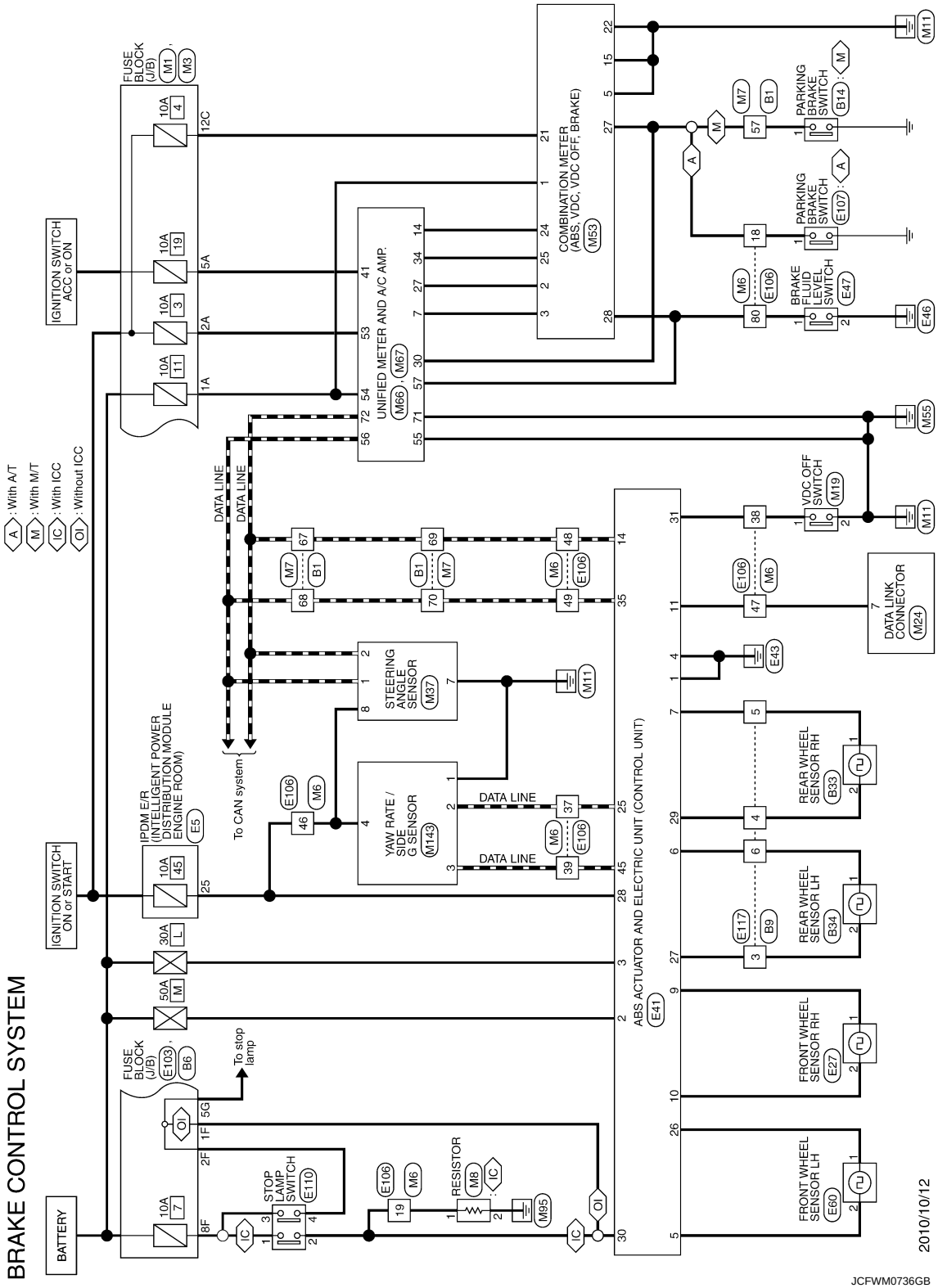
**NOTE:**

- 1: Confirm tire pressure is normal.
- 2: A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.
- 3: On and off timing for warning lamp and indicator lamp.

- ABS warning lamp: refer to BRC-87, "Description".
- Brake warning lamp: refer to BRC-88, "Description".
- VDC OFF indicator lamp: refer to BRC-89, "Description".
- VDC warning lamp: refer to BRC-90, "Description".

# Wiring Diagram - BRAKE CONTROL SYSTEM -

INFOID:0000000006472213



BRAKE CONTROL SYSTEM

| Connector No. | B1 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80FW-CS16-TM4 |

H.S.



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | W | – |
| 2 | L | – |
| 3 | R | – |
| 4 | V | – |
| 5 | W | – |
| 6 | B | – |
| 9 | G | – |
| 10 | BR | – |
| 12 | SHIELD | – |
| 13 | Y | – |
| 14 | L | – |
| 15 | R | – |
| 16 | W | – |
| 17 | BR | – |
| 20 | G | – |
| 21 | SB | – |
| 22 | GR | – |
| 23 | W | – |
| 24 | SB | – |
| 25 | BR | – |
| 26 | LG | – |
| 27 | Y | – |
| 28 | R | – |
| 29 | V | – |
| 31 | SHIELD | – |
| 32 | G | – |
| 33 | R | – |
| 34 | BG | – |
| 35 | GR | – |
| 36 | BR | – |
| 37 | P | – [With climate controlled seat] |
| 37 | Y | – [Without climate controlled seat] |
| 38 | V | – [With climate controlled seat] |
| 38 | GR | – [Without climate controlled seat] |
| 40 | SHIELD | – |
| 41 | L | – |
| 42 | P | – |
| 43 | SHIELD | – |
| 44 | SB | – |
| 45 | V | – |
| 46 | W | – |
| 47 | SB | – |
| 48 | LG | – |
| 49 | LG | – [With BOSE system] |
| 49 | Y | – [Without BOSE system] |
| 50 | SB | – [With BOSE system] |
| 50 | LG | – [Without BOSE system] |
| 51 | SB | – |
| 52 | G | – |
| 53 | LG | – |
| 54 | BR | – |
| 55 | Y | – |
| 56 | W | – |
| 57 | V | – |
| 58 | R | – |
| 60 | R | – |
| 61 | BG | – |
| 62 | B | – |
| 63 | L | – |
| 64 | P | – |
| 65 | B | – |
| 66 | SB | – |
| 67 | P | – |
| 68 | L | – |
| 69 | P | – |
| 70 | L | – |
| 80 | G | – |
| 81 | V | – |
| 82 | R | – |
| 83 | BR | – |
| 84 | G | – |
| 85 | L | – |
| 86 | Y | – |
| 87 | GR | – |
| 91 | R | – |
| 93 | BG | – |
| 94 | P | – |
| 95 | GR | – |
| 96 | GR | – |
| 97 | SB | – |
| 99 | Y | – |
| 100 | Y/B | – |

| Connector No. | B6 |
|---|---|
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS12FBR-CS |

H.S.




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 5G | LG | – |
| 6G | G | – |
| 10G | P | – |
| 11G | G | – |
| 12G | Y | – |

| Connector No. | B9 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | M06FW-LC |

H.S.




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | Y | – |
| 3 | GR | – |
| 4 | LG | – |
| 5 | BR | – |
| 6 | BG | – |

| Connector No. | B14 |
|---|---|
| Connector Name | PARKING BRAKE SWITCH |
| Connector Type | P01FB-A |

H.S.




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | V | – |

| Connector No. | B33 |
|---|---|
| Connector Name | REAR WHEEL SENSOR RH |
| Connector Type | AAZ02FB1 |

H.S.




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | BR | – |
| 2 | LG | – |

| Connector No. | B34 |
|---|---|
| Connector Name | REAR WHEEL SENSOR LH |
| Connector Type | RH02FB |

H.S.

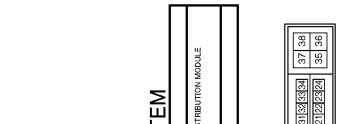



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | BG | – |
| 2 | GR | – |

JCFWM0737GB

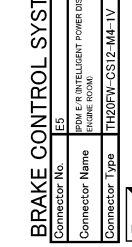
BRAKE CONTROL SYSTEM

| Connector No. | E5 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | TH20FW-CS12-M4-1V |



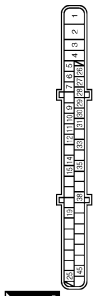
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 4 | V | – |
| 5 | L | – |
| 6 | SB | – |
| 7 | R | – |
| 11 | BR | – |
| 12 | B/W | – |
| 13 | Y | – |
| 16 | LG | – |
| 19 | W | – |
| 25 | G | – |
| 26 | R | – |
| 27 | BG | – |
| 28 | L | – |
| 30 | GR | – |
| 32 | V | – |
| 33 | P | – |
| 36 | G | – |

| Connector No. | E27 |
|---|---|
| Connector Name | FRONT WHEEL SENSOR RH |
| Connector Type | AAZ02FB1 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | W | – |

| Connector No. | E41 |
|---|---|
| Connector Name | ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) |
| Connector Type | BAA42FB-AHZ4-LH |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | GND |
| 2 | L | UBMR |
| 3 | R | UBVR |
| 4 | B | GND |
| 5 | Y | DS FL |
| 6 | BG | DP RL |
| 7 | BR | DP RR |
| 9 | B | DP FR |
| 10 | W | DS FR |
| 11 | V | DIAG-K |
| 14 | P | CAN-L |
| 25 | Y | BUS-L |
| 26 | LG | DP FL |
| 27 | GR | DS RL |
| 28 | G | UZ |
| 29 | P | DS RR |
| 30 | SB | BLS |
| 31 | R | VDC OFF SWITCH |
| 35 | L | CAN-H |
| 45 | B | BUS-H |

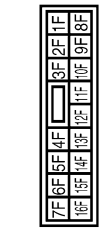
| Connector No. | E47 |
|---|---|
| Connector Name | BRAKE FLUID LEVEL SWITCH |
| Connector Type | YV02FGY |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | W | – |
| 2 | B | – |

| Connector No. | E60 |
|---|---|
| Connector Name | FRONT WHEEL SENSOR LH |
| Connector Type | AAZ02FB1 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | LG | – |
| 2 | Y | – |

| Connector No. | E103 |
|---|---|
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS16FW-CS |



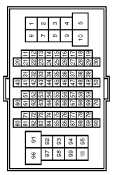
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1F | SB | – |
| 2F | V | – |
| 4F | G | – |
| 6F | BG | – |
| 8F | L | – |
| 9F | R | – |

JCFWM0738GB

BRAKE CONTROL SYSTEM

| Connector No. | E106 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80FW-CS16-TM4 |

H.S.



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | GR | – |
| 3 | BG | – |
| 4 | B/W | – |
| 5 | G | – |
| 6 | BG | – |
| 7 | LG | – |
| 8 | G | – |
| 9 | R | – |
| 10 | W | – |
| 11 | V | – |
| 12 | R | – |
| 13 | L | – |
| 14 | GR | – |
| 15 | P | – |
| 16 | W | – |
| 17 | V | – |
| 18 | BG | – |
| 19 | GR | – |
| 20 | LG | – |
| 30 | R | – |
| 31 | L | – |
| 32 | BG | – |
| 33 | P | – |
| 34 | V | – |
| 35 | BR | – |
| 36 | W | – |
| 37 | Y | – |
| 38 | R | – |
| 39 | B | – |
| 40 | G | – |
| 41 | W | – |
| 42 | LG | – |
| 43 | SB | – |
| 44 | GR | – |
| 45 | BG | – |
| 46 | LG | – |
| 47 | V | – |
| 48 | P | – |
| 49 | L | – |
| 59 | B | – |
| 66 | LG | – |
| 67 | SB | – |
| 68 | R | – |
| 69 | W | – |
| 70 | G | – |
| 80 | W | – |
| 81 | P | – |
| 82 | G | – |
| 83 | V | – |
| 84 | L | – |
| 85 | BG | – |
| 86 | LG | – |
| 87 | Y | – |
| 88 | GR | – |
| 89 | W | – |
| 90 | W | – |
| 91 | G | – |
| 92 | B | – |
| 93 | GR | – |
| 94 | L | – |
| 95 | Y | – |
| 97 | BR | – |
| 98 | SHIELD | – |
| 99 | L | – |
| 100 | P | – |

| Connector No. | E107 |
|---|---|
| Connector Name | PARKING BRAKE SWITCH |
| Connector Type | TB01FW |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | BG | – |

| Connector No. | E110 |
|---|---|
| Connector Name | STOP LAMP SWITCH |
| Connector Type | M04FW-LC |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | – |
| 2 | V | – |
| 3 | L | – [With ICC] |
| 3 | Y | – [Without ICC] |
| 4 | SB | – [With ICC] |
| 4 | W | – [Without ICC] |

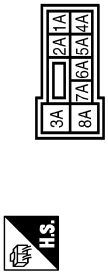
| Connector No. | E117 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | M06MW-LC |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | Y | – |
| 3 | GR | – |
| 4 | P | – |
| 5 | BR | – |
| 6 | BG | – |

| Connector No. | M1 |
|---|---|
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS06FW-M2 |

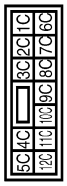
H.S.



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1A | V | – |
| 2A | G | – |
| 3A | L | – |
| 4A | P | – |
| 5A | BR | – |
| 6A | Y | – |
| 7A | GR | – |
| 8A | L | – |

| Connector No. | M3 |
|---|---|
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS12FW-CS |

H.S.



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 6C | R | – |
| 7C | B | – |
| 8C | W | – |
| 9C | BG | – |
| 10C | L | – |
| 11C | LG | – |
| 12C | R | – |

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BRAKE CONTROL SYSTEM

| Connector No. | M6 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80MW-CS16-TM4 |

H.S.



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | BG | – |
| 3 | R | – |
| 4 | G | – |
| 5 | G | – |
| 6 | BR | – |
| 7 | BR | – |
| 8 | Y | – |
| 9 | R | – |
| 10 | W | – |
| 11 | GR | – |
| 12 | R | – |
| 13 | L | – |
| 14 | G | – |
| 15 | P | – |
| 16 | W | – |
| 17 | BR | – |
| 18 | V | – |
| 19 | BG | – |
| 20 | L | – |
| 30 | R | – |
| 31 | L | – |
| 32 | Y | – |
| 33 | GR | – |
| 34 | P | – |
| 35 | BR | – |
| 36 | BR | – |
| 37 | Y | – |
| 38 | LG | – |
| 39 | SB | – |
| 40 | G | – |
| 41 | W | – |
| 42 | LG | – |
| 43 | P | – |
| 44 | GR | – [With A/T] |
| 44 | R | – [With M/T] |
| 45 | BG | – |
| 46 | G | – |
| 47 | P | – |
| 48 | P | – |
| 49 | L | – |
| 59 | B | – |
| 66 | Y | – |
| 67 | G | – |
| 68 | R | – |
| 69 | W | – |
| 70 | G | – |
| 80 | SB | – |
| 81 | R | – |
| 82 | V | – |
| 83 | W | – |
| 84 | L | – |
| 85 | BG | – |
| 86 | G | – |
| 87 | V | – |
| 88 | B | – |
| 89 | SB | – |
| 90 | G | – |
| 91 | W | – |
| 92 | B | – |
| 93 | G | – |
| 94 | L | – |
| 95 | BR | – |
| 97 | P | – |
| 98 | SHIELD | – |
| 99 | V | – |
| 100 | SB | – |

| Connector No. | M7 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80MW-CS16-TM4 |

H.S.



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | BG | – |
| 2 | LG | – |
| 3 | G | – |
| 4 | V | – |
| 5 | L | – |
| 6 | B | – |
| 9 | L | – |
| 10 | BR | – |
| 12 | SHIELD | – |
| 13 | V | – |
| 14 | BR | – |
| 15 | GR | – |
| 16 | LG | – |
| 17 | L | – |
| 20 | BR | – |
| 21 | G | – |
| 22 | R | – |
| 23 | SB | – |
| 24 | B | – |
| 25 | W | – |
| 26 | Y | – |
| 27 | Y | – |
| 28 | P | – |
| 29 | V | – |
| 31 | SHIELD | – |
| 32 | G | – |
| 33 | R | – |
| 34 | BG | – |
| 35 | GR | – |
| 36 | BR | – [With climate controlled seat] |
| 37 | P | – [Without climate controlled seat] |
| 37 | L | – [With climate controlled seat] |
| 38 | V | – [Without climate controlled seat] |
| 38 | GR | – |
| 40 | SHIELD | – |
| 41 | L | – |
| 42 | P | – |
| 43 | SHIELD | – |
| 44 | Y | – |
| 45 | BR | – |
| 46 | SB | – |
| 47 | SB | – |
| 48 | LG | – |
| 49 | LG | – [With BOSE system] |
| 49 | SB | – [Without BOSE system] |
| 50 | SB | – [With BOSE system] |
| 50 | LG | – [Without BOSE system] |
| 51 | R | – |
| 52 | V | – |
| 53 | P | – |
| 54 | BR | – |
| 55 | Y | – [With A/T] |
| 55 | BG | – [With M/T] |
| 56 | L | – |
| 57 | V | – |
| 58 | R | – |
| 60 | LG | – |
| 61 | BG | – |
| 62 | B | – |
| 63 | V | – |
| 64 | SB | – |
| 65 | BR | – |
| 66 | Y | – |
| 67 | P | – |
| 68 | L | – |
| 69 | P | – |
| 70 | L | – |
| 80 | G | – |
| 81 | LG | – |
| 82 | Y | – |
| 83 | BR | – |
| 84 | V | – |
| 85 | L | – |
| 86 | Y | – |
| 87 | GR | – |
| 91 | R | – |
| 93 | G | – |
| 94 | P | – |
| 95 | GR | – |
| 96 | Y | – |
| 97 | SB | – |
| 99 | Y | – |
| 100 | Y/B | – |

| Connector No. | M8 |
|---|---|
| Connector Name | RESISTOR |
| Connector Type | M02FBR-LC |

H.S.



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | BG | – |
| 2 | B | – |

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BRAKE CONTROL SYSTEM

| Connector No. | M19 |
|---|---|
| Connector Name | VDC OFF SWITCH |
| Connector Type | TK06FGY |

H.S.




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | LG | - |
| 2 | B | - |
| 3 | SB | - |
| 4 | W | - |

| Connector No. | M24 |
|---|---|
| Connector Name | DATA LINK CONNECTOR |
| Connector Type | BD16FW |

H.S.




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 3 | LG | - |
| 4 | B | - |
| 5 | BR | - |
| 6 | L | - |
| 7 | V | - |
| 8 | G | - |
| 11 | SB | - |
| 14 | P | - |
| 16 | R | - |

| Connector No. | M37 |
|---|---|
| Connector Name | STEERING ANGLE SENSOR |
| Connector Type | TH08FW-NH |

H.S.




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | CAN-H |
| 2 | P | CAN-L |
| 7 | B | GND |
| 8 | G | IGN |

| Connector No. | M53 |
|---|---|
| Connector Name | COMBINATION METER |
| Connector Type | SAE40FW |

H.S.




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | V | BATTERY POWER SUPPLY |
| 2 | LG | COMMUNICATION SIGNAL (METER->AMP.) |
| 3 | GR | COMMUNICATION SIGNAL (AMP->METER) |
| 5 | B | GROUND |
| 6 | W | ALTERNATOR SIGNAL |
| 7 | LG | AIR BAG SIGNAL |
| 10 | R | SECURITY SIGNAL |
| 15 | B | GROUND |
| 16 | B | METER CONTROL SWITCH GROUND |
| 18 | GR | ILL GND |
| 19 | B | ILL GND |
| 20 | R | ILL |
| 21 | R | IGNITION SIGNAL |
| 22 | B | GROUND |
| 24 | SB | COMMUNICATION SIGNAL (LCD->AMP.) |
| 25 | B | COMMUNICATION SIGNAL (AMP->LCD) |
| 26 | R | VEHICLE SPEED SIGNAL (8-PULSE) |
| 27 | V | PARKING BRAKE SWITCH SIGNAL |

| 28 | SB | BRAKE FLUID LEVEL SWITCH SIGNAL |
|---|---|---|
| 29 | L | SEAT BELT BUCKLE SW SIGNAL (DRIVER SIDE) |
| 30 | G | SEAT BELT BUCKLE SWITCH SIGNAL (PASSENGER SIDE) |
| 31 | L | WASHER LEVEL SWITCH SIGNAL |
| 33 | R | ILLUMINATION CONTROL SIGNAL |
| 36 | LG | SELECT SWITCH SIGNAL |
| 37 | SB | ENTER SWITCH SIGNAL |
| 38 | L | TRIP A/B RESET SWITCH SIGNAL |
| 39 | P | ILLUMINATION CONTROL SWITCH (-) |
| 40 | BG | ILLUMINATION CONTROL SWITCH (+) |

| Connector No. | M66 |
|---|---|
| Connector Name | UNIFIED METER AND A/C AMP. |
| Connector Type | TH40FW-NH |

H.S.




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 4 | G | STOP LAMP SWITCH |
| 5 | L | MANUAL MODE SHIFT UP SIGNAL |
| 6 | BG | PADDLE SHIFTER UP SIGNAL |
| 7 | GR | COMMUNICATION SIGNAL (AMP->METER) |
| 8 | L | VEHICLE SPEED (2-PULSE) |
| 9 | SB | SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE) |
| 10 | W | MANUAL MODE SIGNAL |
| 11 | G | NON-MANUAL MODE SIGNAL |
| 14 | SB | COMMUNICATION SIGNAL (LCD->AMP.) |
| 20 | G | IGN ON / OFF SIGNAL |
| 25 | V | MANUAL MODE SHIFT DOWN SIGNAL |
| 26 | G | PADDLE SHIFTER DOWN SIGNAL |
| 27 | LG | COMMUNICATION SIGNAL (METER->AMP.) |
| 28 | R | VEHICLE SPEED (8-PULSE) |
| 30 | V | PARKING BRAKE SWITCH SIGNAL |
| 34 | B | COMMUNICATION SIGNAL (AMP->LCD) |
| 38 | P | BLOWER MOTOR CONTROL SIGNAL |

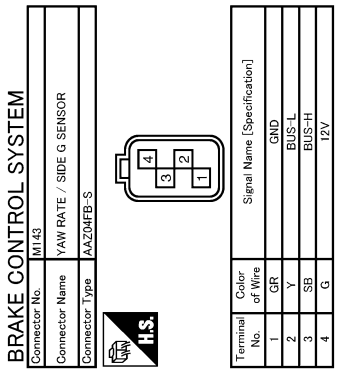
| Connector No. | M67 |
|---|---|
| Connector Name | UNIFIED METER AND A/C AMP. |
| Connector Type | TH32FW-NH |

H.S.




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 41 | BR | ACC POWER SUPPLY |
| 42 | BR | FUEL LEVEL SENSOR SIGNAL |
| 43 | R | INTAKE SENSOR SIGNAL |
| 44 | LG | IN-VEHICLE SENSOR SIGNAL |
| 45 | V | AMBIENT SENSOR SIGNAL |
| 46 | BG | SUNLOAD SENSOR SIGNAL |
| 47 | G | EXHAUST GAS / OUTSIDE DOOR DETECTING SENSOR SIGNAL |
| 53 | W | IGNITION POWER SUPPLY |
| 54 | BG | BATTERY POWER SUPPLY |
| 55 | B | GROUND |
| 56 | L | CAN-H |
| 57 | LG | BRAKE FLUID LEVEL SWITCH SIGNAL |
| 58 | Y | FUEL LEVEL SENSOR SIGNAL GROUND |
| 59 | GR | INTAKE SENSOR GROUND |
| 60 | L | IN-VEHICLE SENSOR GROUND |
| 61 | R | AMBIENT SENSOR GROUND |
| 62 | SB | SUNLOAD SENSOR GROUND |
| 63 | L | ION CONTROL MODE OUTPUT SIGNAL |
| 65 | BG | ECV SIGNAL |
| 69 | L | A/C LAN SIGNAL |
| 70 | R | EACH DOOR MOTOR POWER SUPPLY |
| 71 | GR | GROUND |
| 72 | P | CAN-L |

JCFWM0741GB




JCFWM0742GB

## Fail-Safe

*INFOID:0000000006472214*

### ABS, EBD SYSTEM

If ABS malfunction electrically, ABS warning lamp, VDC warning lamp will turn on. If EBD malfunction electrically, brake warning lamp, ABS warning lamp, and VDC warning lamp will turn on. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the fail-safe function.

- For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without TCS/ABS system.
  **NOTE:**
  ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for “Ignition switch ON” and “The first starting” are being performed.
- For malfunction of EBD, EBD and ABS become inoperative, and the condition of vehicle is the same as the condition of vehicles without TCS/ABS, EBD system.

VDC, TCS

If VDC/TCS/ABS system malfunction electrically, VDC warning lamp are turned on, and the condition of vehicle is the same as the condition of vehicles without VDC and TCS control.

**CAUTION:**

**If the Fail-Safe function is activated, then perform self-diagnosis for “ABS” with CONSULT-III.**

## DTC Inspection Priority Chart

*INFOID:0000000006472215*

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

| Priority | Detected items (DTC) |
|---|---|
| 1 | • U1000 CAN COMM CIRCUIT<br>• U1002 SYSTEM COMM (CAN) |
| 2 | • C1110 CONTROLLER FAILURE<br>• C1153 EMERGENCY BRAKE<br>• C1170 VARIANT CORDING |
| 3 | • C1130 ENGINE SIGNAL 1<br>• C1131 ENGINE SIGNAL 2<br>• C1132 ENGINE SIGNAL 3<br>• C1144 ST ANG SEN SIGNAL<br>• C1185 ACC CONT<br>• C1198 VACUUM SEN CIR<br>• C1199 BRAKE BOOSTER |
| 4 | • C1109 BATTERY VOLTAGE [ABNORMAL]<br>• C1111 PUMP MOTOR<br>• C1140 ACTUATOR RLY |
| 5 | • C1101 RR RH SENSOR-1<br>• C1102 RR LH SENSOR-1<br>• C1103 FR RH SENSOR-1<br>• C1104 FR LH SENSOR-1<br>• C1105 RR RH SENSOR-2<br>• C1106 RR LH SENSOR-2<br>• C1107 FR RH SENSOR-2<br>• C1108 FR LH SENSOR-2<br>• C1115 ABS SENSOR [ABNORMAL SIGNAL]<br>• C1116 STOP LAMP SW<br>• C1120 FR LH IN ABS SOL<br>• C1121 FR LH OUT ABS SOL<br>• C1122 FR RH IN ABS SOL<br>• C1123 FR RH OUT ABS SOL<br>• C1124 RR LH IN ABS SOL<br>• C1125 RR LH OUT ABS SOL<br>• C1126 RR RH IN ABS SOL<br>• C1127 RR RH OUT ABS SOL<br>• C1142 PRESS SEN CIRCUIT<br>• C1143 ST ANG SEN CIRCUIT<br>• C1145 YAW RATE SENSOR<br>• C1146 SIDE G-SEN CIRCUIT<br>• C1147 USV LINE [FL-RR]<br>• C1148 USV LINE [FR-RL]<br>• C1149 HSV LINE [FL-RR]<br>• C1150 HSV LINE [FR-RL] |
| 6 | • C1155 BR FLUID LEVEL LOW |

# DTC Index

INFOID:0000000006472216

| DTC | Items (CONSULT screen terms) | Reference |
|---|---|---|
| C1101 | RR RH SENSOR-1 | BRC-32, "DTC Logic" |
| C1102 | RR LH SENSOR-1 | |
| C1103 | FR RH SENSOR-1 | |
| C1104 | FR LH SENSOR-1 | |
| C1105 | RR RH SENSOR-2 | BRC-35, "DTC Logic" |
| C1106 | RR LH SENSOR-2 | |
| C1107 | FR RH SENSOR-2 | |
| C1108 | FR LH SENSOR-2 | |
| C1109 | BATTERY VOLTAGE [ABNORMAL] | BRC-40, "DTC Logic" |
| C1110 | CONTROLLER FAILURE | BRC-42, "DTC Logic" |
| C1111 | PUMP MOTOR | BRC-43, "DTC Logic" |
| C1115 | ABS SENSOR [ABNORMAL SIGNAL] | BRC-45, "DTC Logic" |
| C1116 | STOP LAMP SW | BRC-50, "DTC Logic" |
| C1120 | FR LH IN ABS SOL | BRC-55, "DTC Logic" |
| C1121 | FR LH OUT ABS SOL | BRC-57, "DTC Logic" |
| C1122 | FR RH IN ABS SOL | BRC-55, "DTC Logic" |
| C1123 | FR RH OUT ABS SOL | BRC-57, "DTC Logic" |
| C1124 | RR LH IN ABS SOL | BRC-55, "DTC Logic" |
| C1125 | RR LH OUT ABS SOL | BRC-57, "DTC Logic" |
| C1126 | RR RH IN ABS SOL | BRC-55, "DTC Logic" |
| C1127 | RR RH OUT ABS SOL | BRC-57, "DTC Logic" |
| C1130 | ENGINE SIGNAL 1 | BRC-59, "DTC Logic" |
| C1131 | ENGINE SIGNAL 2 | |
| C1132 | ENGINE SIGNAL 3 | |
| C1140 | ACTUATOR RLY | BRC-60, "DTC Logic" |
| C1142 | PRESS SEN CIRCUIT | BRC-62, "DTC Logic" |
| C1143 | ST ANG SEN CIRCUIT | BRC-64, "DTC Logic" |
| C1144 | ST ANG SEN SIGNAL | BRC-66, "DTC Logic" |
| C1145 | YAW RATE SENSOR | BRC-67, "DTC Logic" |
| C1146 | SIDE G-SEN CIRCUIT | |
| C1147 | USV LINE [FL-RR] | BRC-70, "DTC Logic" |
| C1148 | USV LINE [FR-RL] | |
| C1149 | HSV LINE [FL-RR] | |
| C1150 | HSV LINE [FR-RL] | |
| C1153 | EMERGENCY BRAKE | BRC-42, "DTC Logic" |
| C1155 | BR FLUID LEVEL LOW | BRC-72, "DTC Logic" |
| C1170 | VARIANT CORDING | BRC-42, "DTC Logic" |
| C1185 | ACC CONT | BRC-75, "DTC Logic" |
| C1198 | VACUUM SEN CIR | BRC-76, "DTC Logic" |
| C1199 | BRAKE BOOSTER | BRC-77, "DTC Logic" |
| U1000 | CAN COMM CIRCUIT | BRC-78, "DTC Logic" |
| U1002 | SYSTEM COMM | BRC-79, "DTC Logic" |

# SYMPTOM DIAGNOSIS

## EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

### Diagnosis Procedure

INFOID:0000000006472217

#### 1.CHECK START

Check front and rear brake force distribution using a brake tester. Refer to BR-64, "General Specifications".

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.
- Front: refer to FAX-6, "Inspection".
- Rear: refer to RAX-5, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

#### 3.CHECK WHEEL SENSOR AND SENSOR ROTOR

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

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace wheel sensor or sensor rotor.
- Front wheel sensor: refer to BRC-115, "FRONT WHEEL SENSOR : Exploded View".
- Rear wheel sensor: refer to BRC-116, "REAR WHEEL SENSOR : Exploded View".
- Front sensor rotor: refer to BRC-117, "FRONT SENSOR ROTOR : Exploded View".
- Rear sensor rotor: refer to BRC-117, "REAR SENSOR ROTOR : Exploded View".

#### 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 for “ABS” with CONSULT-III.
NO >> Normal

# UNEXPECTED PEDAL REACTION

## Diagnosis Procedure

INFOID:0000000006472218

### 1.CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-8, "Inspection and Adjustment".

Is the stroke too large?

YES >> • Bleed air from brake tube and hose. Refer to BR-12, "Bleeding Brake System".
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc.
- Brake fluid: refer to BR-11, "Inspection".
- Brake pedal: refer to BR-8, "Inspection and Adjustment".
- Brake master cylinder: refer to BR-13, "Inspection".
- Brake booster: refer to BR-14, "Inspection".
- Front disc brake: refer to BR-45, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection" (1 piston type), BR-49, "BRAKE CALIPER ASSEMBLY (4 PISTON TYPE) : Inspection" (4 piston type).
- Rear disc brake: refer to BR-58, "BRAKE CALIPER ASSEMBLY (1 PISTON TYPE) : Inspection" (1 piston type), BR-63, "BRAKE CALIPER ASSEMBLY (2 PISTON TYPE) : Inspection" (2 piston type).

NO >> GO TO 2.

### 2.CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal
NO >> Check brake system.

# THE BRAKING DISTANCE IS LONG

## Diagnosis Procedure

INFOID:0000000006472219

**CAUTION:**

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

### 1.CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal
NO >> Check brake system.

# ABS FUNCTION DOES NOT OPERATE

## Diagnosis Procedure

INFOID:0000000006472220

**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 for “ABS” with CONSULT-III.

# PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

## Diagnosis Procedure

INFOID:0000000006472221

**CAUTION:**

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

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

### 1. SYMPTOM CHECK 1

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

Do vibrations occur?

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

### 2. SYMPTOM CHECK 2

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

Do the operation noises occur?

YES >> GO TO 3.
NO >> Perform self -diagnosis.

### 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

## Diagnosis Procedure

INFOID:0000000006472222

### 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 for “ABS” with CONSULT-III.

Are self-diagnosis results indicated?

YES >> Check corresponding items, make repairs, and perform self-diagnosis for “ABS” with CONSULT-III.
NO >> GO TO 3.

### 3.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) harness connector, and terminal for deformation, disconnection, looseness, etc.
3. Securely connect harness connectors and perform self-diagnosis for “ABS” with CONSULT-III.

Are self-diagnosis results indicated?

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

### 4.CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

Perform self-diagnosis for “ENGINE” and “TRANSMISSION” with CONSULT-III.

Are self-diagnosis results indicated?

YES >> Check the corresponding items.
NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-118, "Exploded View".

# NORMAL OPERATING CONDITION

## Description

INFOID:0000000006472223

| 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 a normal, and it is caused by the ABS operation check. |
| Depending on the road conditions, the driver may experience a sluggish feel. | This is normal, because TCS places the highest priority on the optimum traction (stability). |
| TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal. | |
| The ABS warning lamp, and VDC warning lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running. | In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. At that time, erase the self-diagnosis memory. |
| VDC may not operate normally or the ABS warning lamp, and VDC warning 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 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 warning 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:0000000006472224

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

**WARNING:**

**Always observe the following items for preventing accidental activation.**

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

**WARNING:**

**Always observe the following items for preventing accidental activation.**

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

### Service Procedure Precautions for Models with a Pop-up Roll Bar

INFOID:0000000006472225

**WARNING:**

**Always observe the following items for preventing accidental activation.**

- **Risk of passenger injury or death may increase if the pop-up roll bar does not deploy during a roll over collision. In order to reduce the chance of an incident where the pop-up roll bar is inoperative, all maintenance must be performed by a NISSAN or INFINITI dealer.**
- **Before removing and installing the pop-up roll bar component parts and harness, always turn the ignition switch OFF, disconnect the battery negative terminal, and wait for 3 minutes or more. (The purpose of this operation is to discharge electricity that is accumulated in the auxiliary power supply circuit in the air bag diagnosis sensor unit.)**
- **When repairing, removing, and installing a pop-up roll bar, always refer to SRS AIR BAG and SRS AIR BAG CONTROL warnings in the Service Manual.**

### Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:0000000006472226

**CAUTION:**

**Comply with the following cautions to prevent any error and malfunction.**

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

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   **NOTE:**
   Supply power using jumper cables if battery is discharged.
2. Turn the ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

## Precaution for Battery Service

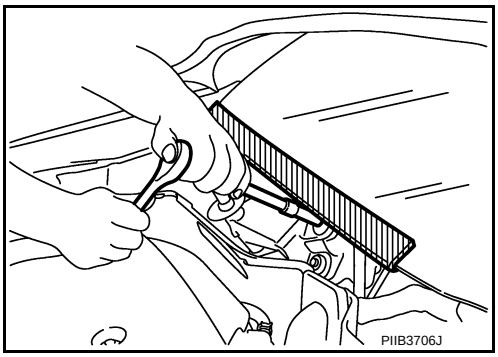
INFOID:0000000006472227

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

## Precaution for Procedure without Cowl Top Cover

INFOID:0000000006472228

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.

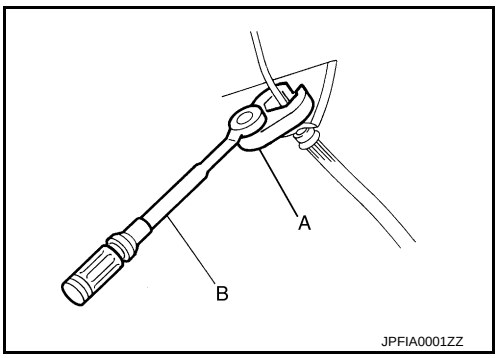



## Precaution for Brake System

INFOID:0000000006472229

**WARNING:**
**Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.**
- Brake fluid use refer to MA-10, "Fluids and Lubricants".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Never use mineral oils such as gasoline or light oil. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.

- Tighten the brake tube flare nut to the specified torque with a crow-foot (A) and torque wrench (B).
- Always conform the specified tightening torque when installing the brake pipes.
- 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.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) harness connector or the battery negative terminal before performing the work.




## Precaution for Brake Control

INFOID:0000000006472230

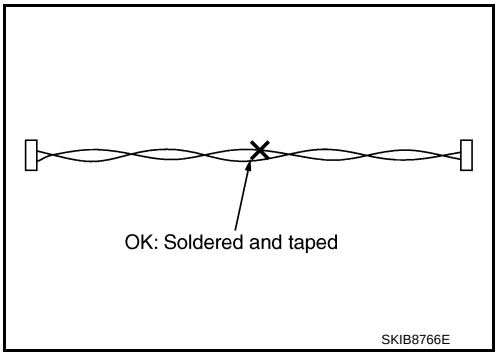
- When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is normal condition.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for estimate causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level, and oil leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- VDC system may not operate normally or a VDC warning lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspension related parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).
- When driving with worn or deteriorated suspension, tires and brake-related parts.

## Precautions for Harness Repair

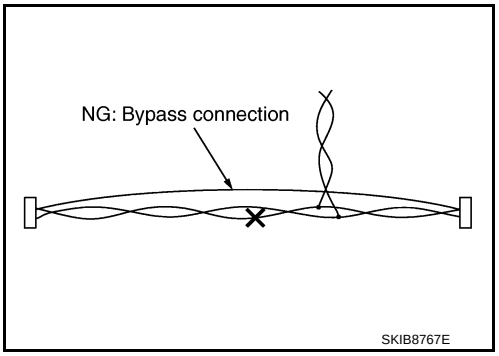
INFOID:0000000006472231

COMMUNICATION LINE

- Solder the repaired area and wrap tape around the soldered area.
  **NOTE:**
  A fray of twisted lines must be within 110 mm (4.33 in).




- Bypass connection is never allowed at the repaired area.
  **NOTE:**
  Bypass connection may cause communication error as spliced wires that are separate from the main line or twisted lines lose noise immunity.
- Replace the applicable harness as an assembly if error is detected on the shield lines of communication line.



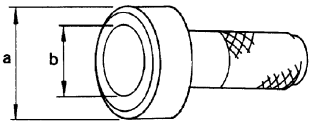
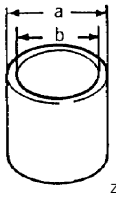
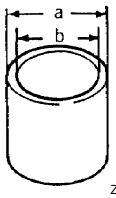
# PREPARATION

## PREPARATION

### Special Service Tool

INFOID:0000000006472232

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

| Tool number<br>(Kent-Moore No.)<br>Tool name | | Description |
|---|---|---|
| ST30720000<br>(J-25405)<br>Drift<br>a: 77 mm (3.03 in) dia.<br>b: 55.5 mm (2.185 in) dia. |  <br>ZZA0701D | |
| ST27863000<br>( — )<br>Drift<br>a: 74.5 mm (2.933 in) dia.<br>b: 62.5 mm (2.461 in) dia. |  <br>ZZA0832D | Installing rear sensor rotor |
| KV40104710<br>( — )<br>a: 76.3 mm (3.004 in) dia.<br>b: 67.9 mm (2.673 in) dia. |  <br>ZZA0832D | |

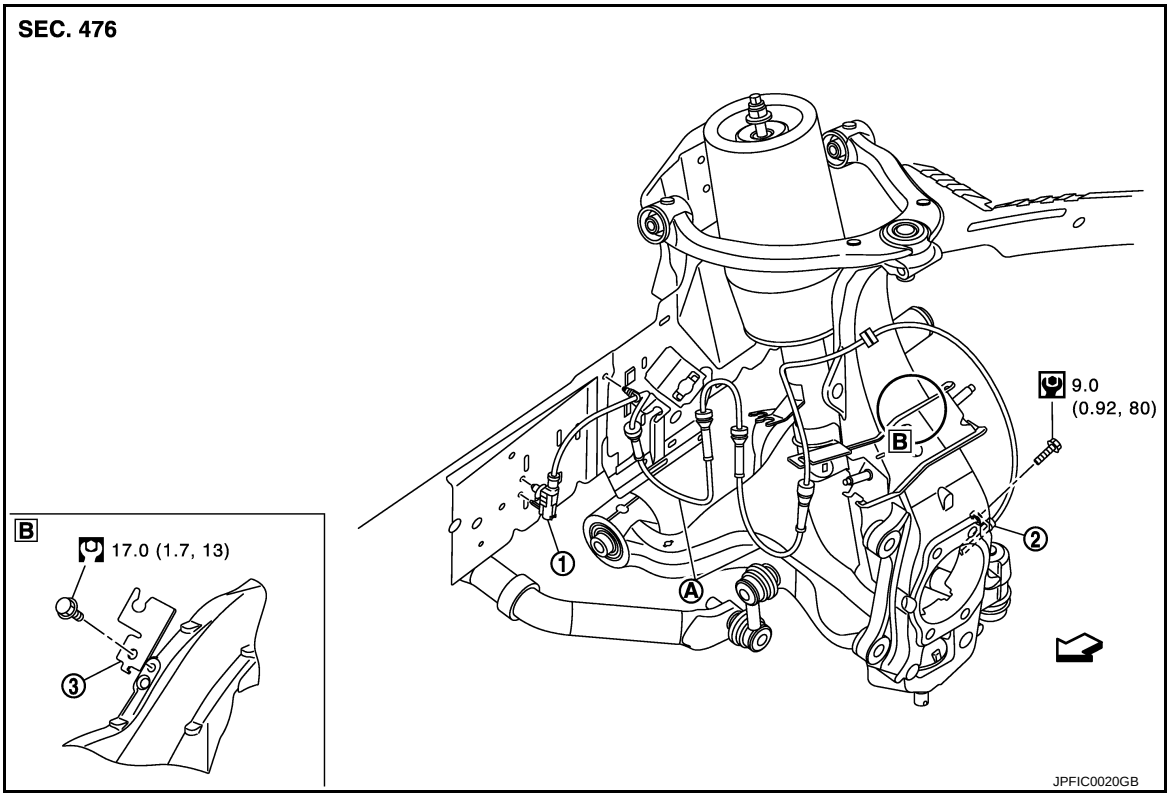
# REMOVAL AND INSTALLATION

## WHEEL SENSOR

### FRONT WHEEL SENSOR

#### FRONT WHEEL SENSOR : Exploded View

INFOID:0000000006472233




1. Front LH wheel sensor harness connector
2. Front LH wheel sensor
3. Bracket

A. Color line

⇦: Vehicle front

Refer to GI-4, "Components" for symbols in the figure.

**NOTE:**
The above figure (front side) shows left side. Right side is the mirror image.

#### FRONT WHEEL SENSOR : Removal and Installation

INFOID:0000000006472234

##### REMOVAL

Note the following, and when removing wheel sensor.

- Never twist sensor harness as much as possible, when removing it. Pull wheel sensors out without pulling sensor harness.
- Be careful to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front wheel hub and bearing assembly. This is to avoid damage to wheel sensor wiring and loss of wheel sensor function.

##### INSTALLATION

Note the following, and when installing wheel sensor. Tighten installation bolts to the specified torques.

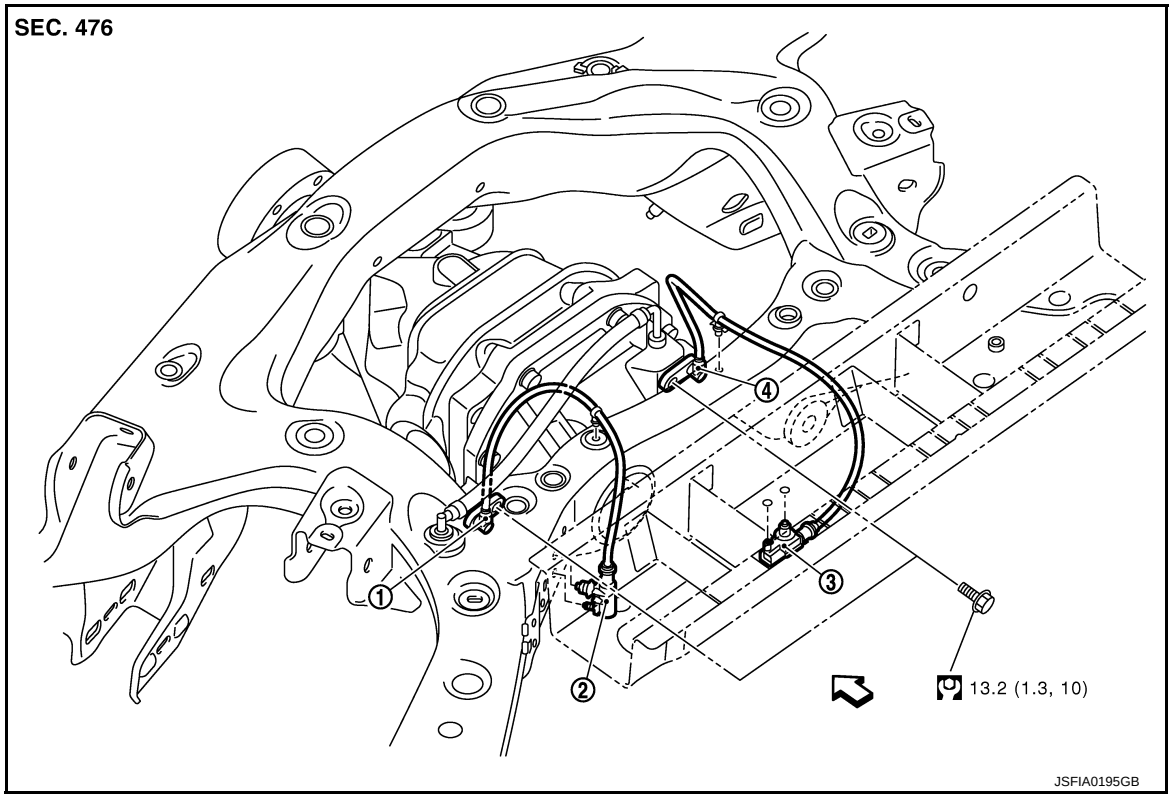
- When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.

- When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.
- When you see the harness of the wheel sensor from the front side of the vehicle ensure that the color lines (A) are not twisted.

## REAR WHEEL SENSOR

### REAR WHEEL SENSOR : Exploded View

INFOID:0000000006472235




1. Rear LH wheel sensor
2. Rear LH wheel sensor harness connector
3. Rear RH wheel sensor harness connector
4. Rear RH wheel sensor

⇦: Vehicle front

Refer to GI-4, "Components" for symbols in the figure.

### REAR WHEEL SENSOR : Removal and Installation

INFOID:0000000006472236

#### REMOVAL

Note the following, when removing sensor harness.

- Never twist sensor harness as much as possible, when removing it. Pull wheel sensors out without pulling sensor harness.
- Be careful to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing side flange. This is to avoid damage to sensor wiring and loss of sensor function.

#### INSTALLATION

Note the following, when installing wheel sensor. Tighten installation bolts to the specified torques.

- When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.

# SENSOR ROTOR

## FRONT SENSOR ROTOR

### FRONT SENSOR ROTOR : Exploded View

INFOID:0000000006472237

Refer to FAX-7, "Exploded View".

### FRONT SENSOR ROTOR : Removal and Installation

INFOID:0000000006472238

REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to FAX-7, "Exploded View".

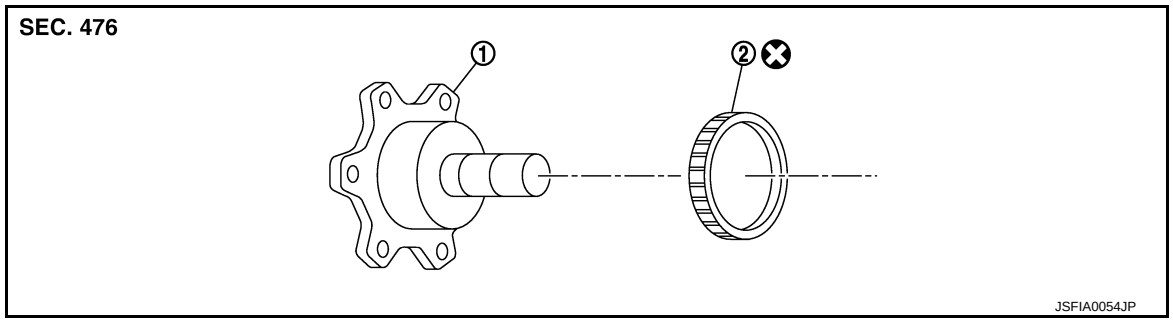
INSTALLATION

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to FAX-7, "Exploded View".

## REAR SENSOR ROTOR

### REAR SENSOR ROTOR : Exploded View

INFOID:0000000006472239




1. Side flange
2. Rear wheel sensor rotor

Refer to GI-4, "Components" for symbols in the figure.

### REAR SENSOR ROTOR : Removal and Installation

INFOID:0000000006472240

REMOVAL

- Follow the procedure below to remove rear sensor rotor.
- Remove side flange. Refer to DLN-40, "M/T : Exploded View" (M/T), DLN-41, "A/T : Exploded View" (A/T).
- Using a bearing replacer (suitable tool) and puller (suitable tool), remove sensor rotor from side flange.

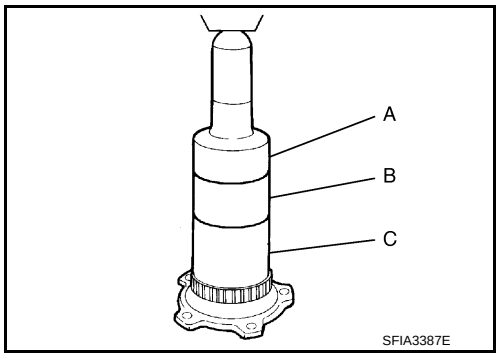
INSTALLATION

**CAUTION:**

**Never reuse sensor rotor.**

- Follow the procedure below to install rear sensor rotor.
- Using a drifts, press rear sensor rotor onto side flange.

A : Drift [SST: ST30720000 (J-25405)]
B : Drift [SST: ST27863000 ( — )
C : Drift [SST: KV40104710 ( — )

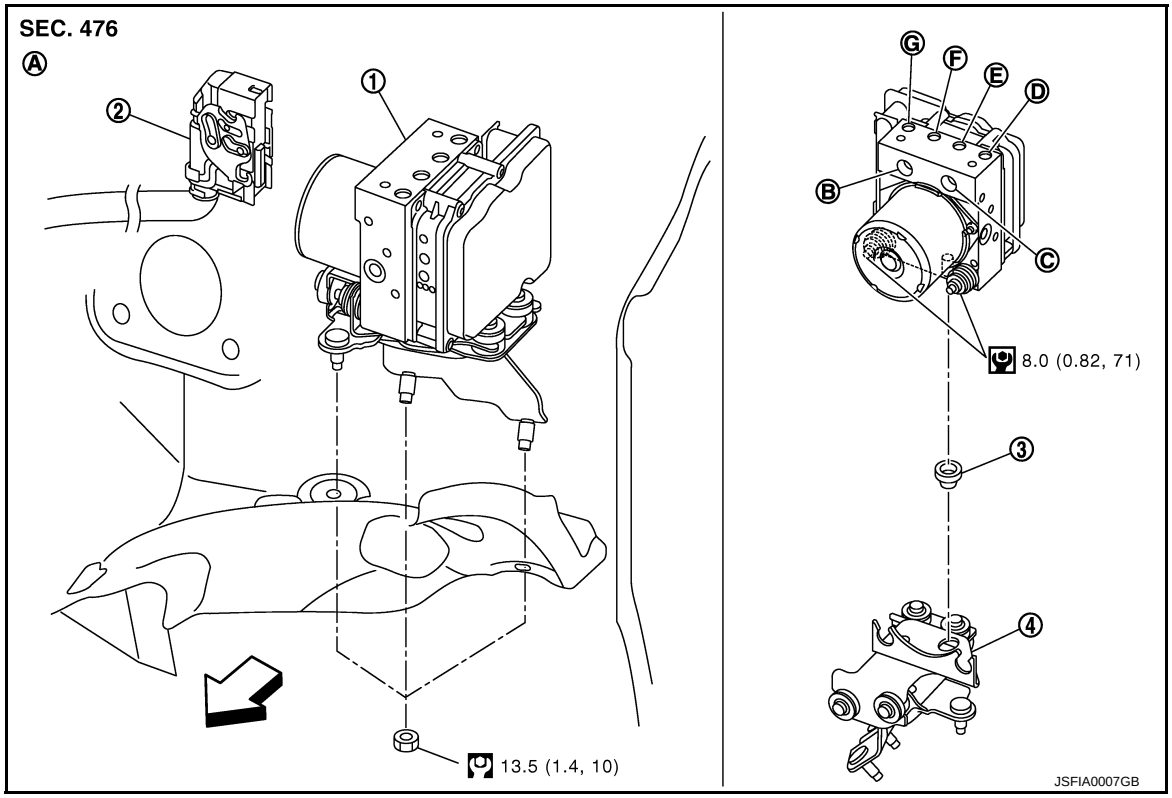



- Install side flange. Refer to DLN-40, "M/T : Exploded View" (M/T), DLN-41, "A/T : Exploded View" (A/T).

# ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

## Exploded View

INFOID:0000000006472241




| | | | | | |
|---|---|---|---|---|---|
| 1. | ABS actuator and electric unit (control unit) | 2. | Harness connector | 3. | Bushing |
| 4. | Bracket | | | | |
| A. | Left side of dash panel | B. | From master cylinder secondary side | C. | From master cylinder primary side |
| D. | To front LH brake caliper | E. | To rear RH brake caliper | F. | To Rear LH brake caliper |
| G. | To front RH brake caliper | | | | |

⇦: Vehicle front

Refer to GI-4, "Components" for symbols in the figure.

## Removal and Installation

INFOID:0000000006472242

### REMOVAL

1. Disconnect the battery cable from negative terminal.
2. Remove cowl top cover. Refer to EXT-23, "Exploded View".
3. Drain brake fluid. Refer to BR-11, "Draining".
4. Disconnect ABS actuator and electric unit (control unit) harness connector.
5. Remove brake booster pressure sensor mounting bracket. Hang brake booster pressure sensor mounting bracket not to interfere with work.
6. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit). Refer to BR-21, "FRONT : Exploded View".
7. Remove brake tube form between ABS actuator and electric unit (control unit) and master cylinder assembly. Refer to BR-21, "FRONT : Exploded View".
8. Remove tire (front LH side).
9. Remove fender protector (rear): (front LH side). Refer to EXT-26, "FENDER PROTECTOR : Exploded View".

10. Remove ABS actuator and electric unit (control unit) bracket mounting nut.
11. Remove ABS actuator and electric unit (control unit) from vehicle.

**CAUTION:**

- **Never apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.**
- **Never remove actuator by holding harness.**

## INSTALLATION

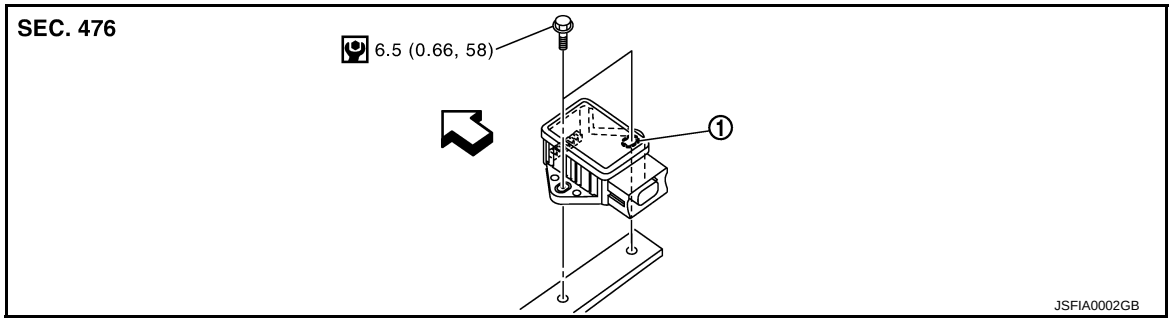
Note the following, and install in the reverse order of removal.

- Install, use flare nut crowfoot and torque wrench. Refer to BR-21, "FRONT : Exploded View".
- Never apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Never install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to BR-12, "Bleeding Brake System".
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure harness connector is securely locked.
- When replacing ABS actuator and electric unit (control unit), make sure to adjust neutral position of steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

# YAW RATE/SIDE G SENSOR

## Exploded View

INFOID:0000000006472243




1. Yaw rate/side G sensor

⇦: Vehicle front

Refer to GI-4, "Components" for symbols in the figure.

## Removal and Installation

INFOID:0000000006472244

### REMOVAL

**CAUTION:**

- **Never drop or strike yaw rate/side G sensor, or never use power tool etc., because yaw rate/side G sensor is sensitive to the impact.**

1. Remove center console. Refer to IP-34, "A/T MODELS : Exploded View" (A/T), IP-39, "M/T MODELS : Exploded View" (M/T).
2. Disconnect yaw rate/side G sensor harness connector.
3. Remove mounting bolts. Remove yaw rate/side G sensor.

### INSTALLATION

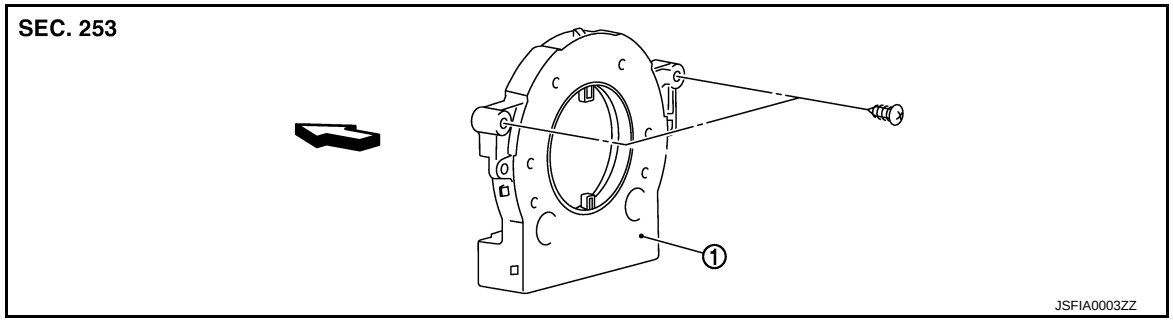
Note the following, and install in the reverse order of removal.

- Never drop or strike yaw rate/side G sensor, or never use power tool etc., because yaw rate/side G sensor is sensitive to the impact.

# STEERING ANGLE SENSOR

## Exploded View

INFOID:0000000006472245




1. Steering angle sensor

⇦: Vehicle front

## Removal and Installation

INFOID:0000000006472246

### REMOVAL

1. Remove spiral cable assembly. Refer to SR-15, "Exploded View".
2. Remove steering angle sensor from spiral cable assembly.

### INSTALLATION

Note the following, and install in the reverse order of removal.

- Never reuse steering angle sensor.
- After work, make sure to adjust neutral position of steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

# VDC OFF SWITCH

## Removal and Installation

INFOID:0000000006472247

### REMOVAL

1. Remove Instrument lower panel LH. Refer to IP-12, "A/T MODELS : Exploded View" (A/T), IP-23, "M/T MODELS : Exploded View" (M/T).
2. Remove VDC OFF switch.

### INSTALLATION

Install in the reverse order of removal.

# SYSTEM DESCRIPTION

## PREVIEW FUNCTION

### System Description

INFOID:0000000006472248

#### FUNCTION DESCRIPTION

When the Preview Function identifies the need to apply emergency braking by sensing a vehicle ahead in the same lane and the distance and relative speed from it, it applies the brake pre-pressure before the driver depress the brake pedal and helps improve brake response by reducing pedal free play.
The Preview Function shares component parts and diagnosis with the ICC (Intelligent Cruise Control) system.

**CAUTION:**

**This system is only an aid to assist braking operation and is not a collision warning or avoidance device. It is the driver′s responsibility to stay alert, drive safely and be in control of the vehicle at all times.**

#### OPERATION DESCRIPTION

Operation

- The system detects the distance to the vehicle in front with the ICC sensor integrated unit of ICC and judges the necessity of emergency braking.
- The system detects the accelerator pedal release operation of the driver by the accelerator pedal position sensor and estimates the driver's brake operation intention.
- If the system is judged that the emergency braking is necessary and that the driver has the intention to operate the brake, the ABS actuator and electric unit (control unit) applies pre-pressure to reduce brake pedal play.

**NOTE:**

This system will not operate when the vehicle is moving at approximately 32 km/h (20 MPH) or less.

End of Operation

The pre-pressure function ceases when the following conditions are met:

1. When the driver depresses the accelerator pedal or the brake pedal.
2. If the driver does not operate the accelerator pedal or brake pedal within approximately 1 second.

## Component Parts Location

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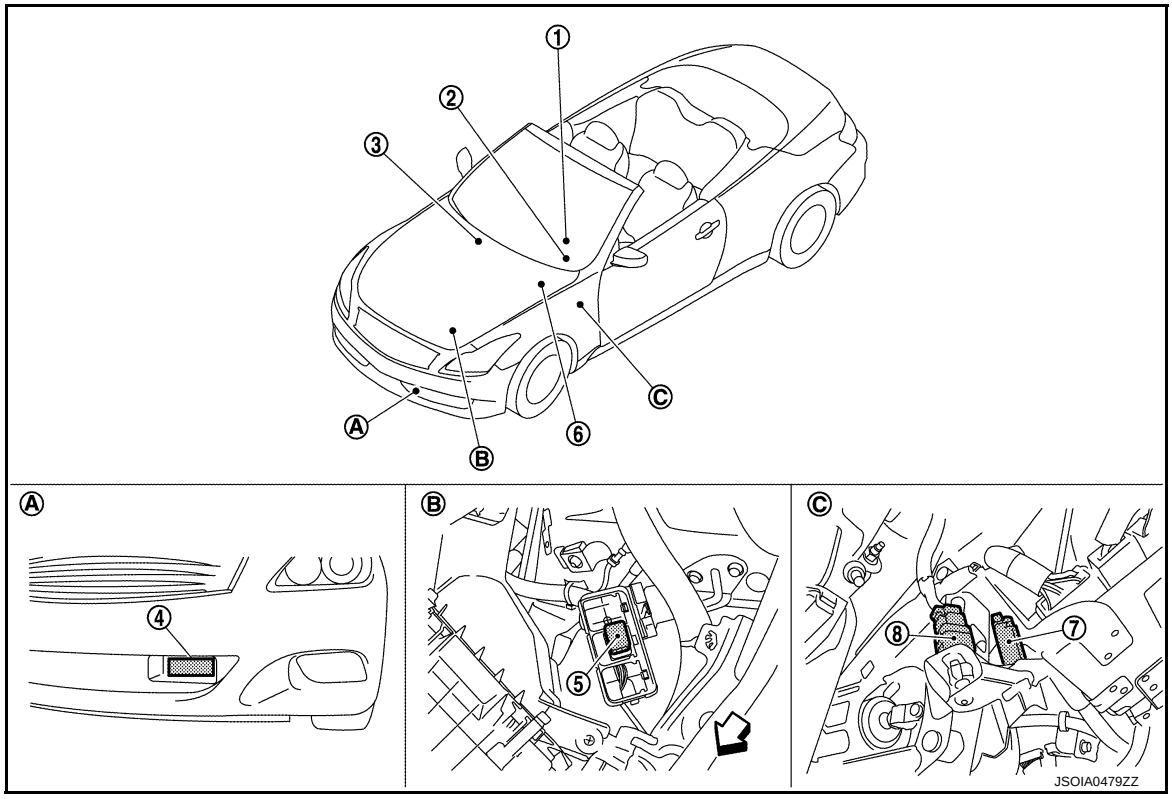



1. Information display, ICC system warning lamp, buzzer
2. ICC steering switch
3. ECM
   Refer to EC-38, "Component Parts Location"
4. ICC sensor integrated unit
5. ICC brake hold relay
6. ABS actuator and electric unit (control unit)
   Refer to BRC-11, "Component Parts Location"
7. ICC brake switch
8. Stop lamp switch

A. Front bumper (LH)
B. Engine room (LH)
C. Upper side of brake pedal

## Component Description

INFOID:0000000006924455

×: Applicable

| Component | Function Description | | | Description |
|---|---|---|---|---|
| | *1 | *2 | *3 | |
| ICC sensor integrated unit | × | × | × | Refer to CCS-41, "Description". |
| ECM | × | × | × | Refer to CCS-63, "Description". |
| ABS actuator and electric unit (control unit) | × | × | × | Refer to CCS-47, "Description". |
| BCM | × | | | Transmits the front wiper request signal to ICC sensor integrated unit via CAN communication. |
| TCM | × | × | | Refer to CCS-88, "Description". |
| Unified meter and A/C amp. | × | × | × | Receives the meter display signal, buzzer output signal, and ICC warning lamp signal from ICC sensor integrated unit via CAN communication and transmits them to the combination meter via the communication line. |

| Component | Function Description | | | Description |
|---|---|---|---|---|
| | *1 | *2 | *3 | |
| Combination meter | × | × | × | Performs the following operations using the signals received from the unified meter and A/C amp. via the communication line.<br>• Displays the ICC system operation status using the meter display signal.<br>• Illuminates the ICC system warning lamp using the ICC warning lamp signal.<br>• Operates the buzzer (ICC warning chime) using the buzzer output signal. |
| ICC brake switch | × | × | × | Refer to CCS-49, "Description". |
| Stop lamp switch | × | × | × | |
| ICC brake hold relay | × | | × | Refer to CCS-57, "Description". |

*1: Vehicle-to-vehicle distance control mode

*2: Conventional (fixed speed) cruise control mode

*3: Brake Assist (With Preview Function)

# DTC/CIRCUIT DIAGNOSIS

## PREVIEW FUNCTION

### Diagnosis Procedure

INFOID:0000000006472251

### 1.PREVIEW FUNCTION DIAGNOSIS

When the preview function is not operating properly, the buzzer sounds and the preview function warning lamp will come on.

**NOTE:**

The preview function warning lamp shares the ICC system warning lamp.

>> Go to ICC. Refer to CCS-4, "Work Flow".

# SYMPTOM DIAGNOSIS

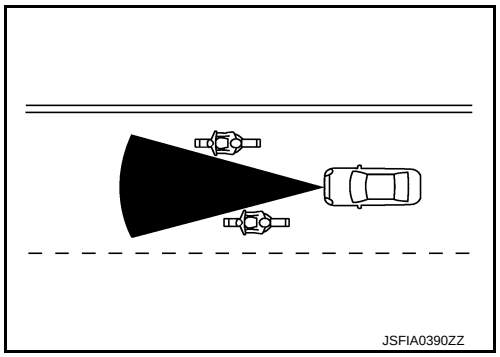
## NORMAL OPERATING CONDITION

### Description

INFOID:0000000006472252

PRECAUTIONS FOR PREVIEW FUNCTION

- This system is only an aid to assist braking operation and is not a collision warning or avoidance device. It is the driver′s responsibility to stay alert, drive safely and be in control of the vehicle at all times.
- As there is a performance limit to the Preview Function, never rely solely on this system. This system does not correct careless inattentive or absent-minded driving, or overcome poor visibility in rain, fog, or other bad weather. Reduce vehicle speed by depressing the brake, in order to maintain a safe distance between vehicles.
- The system may not detect a vehicle ahead, depending on road or weather conditions. While the vehicle still travels and the Brake Assist System operates under normal conditions, the Preview Function may operate improperly under the following conditions:
- When rain, snow or dirt adhere to the system sensor
- When strong light (for example, at sunrise or sunset) is directly shining on the front of the vehicle
- Winding or hilly roads may cause the sensor to temporarily not detect a vehicle in the same lane or may detect objects or vehicles in other lanes.
- Vehicle position in the lane may cause the sensor to temporarily not detect a vehicle in the same lane or may detect objects or vehicles in other lanes.
- The system will not detect:
- Pedestrians or objects in the roadway
- Oncoming vehicles in the same lane
- Motorcycles traveling offset in the travel lane as illustrated
- When the Preview Function operates, the brake pedal may move slightly and may make a small noise. This is not a system malfunction.



# PRECAUTION

## PRECAUTIONS

### Precautions for Preview Function Service

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**CAUTION:**

- **Never look straight into the laser beam discharger when adjusting laser beam aiming.**
- **Never use the ICC sensor integrated unit removed from vehicle. Never disassemble or remodel.**