SECTION BRAKE CONTROL SYSTEM

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VDC/TCS/ABS

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< BASIC INSPECTION >

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BASIC INSPECTION DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

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 <u>BRC-9</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"</u>.

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

OVERALL SEQUENCE



DETAILED FLOW

1.COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis work sheet. Refer to <u>BRC-8</u>, "<u>Diagnostic Work Sheet</u>".

>> GO TO 2.

DIAGNOSIS AND REPAIR WORK FLOW

| DIAGNOSIS AND REFAIR WORKTEOW | |
|---|----------------|
| < BASIC INSPECTION > [VDC/TCS | 3/ABS] |
| 2.PERFORM THE SELF-DIAGNOSIS | |
| Perform self-diagnosis for "ABS" with CONSULT-III. | |
| Is there any DTC displayed? | |
| YES >> GO TO 3. | |
| NO $>>$ GO IO 4. 2 DEDECODATES DIA ONOCIO | |
| J.PERFORM THE SYSTEM DIAGNOSIS | |
| Perform the diagnosis applicable to the displayed DTC of "ABS" with CONSULT-III. Refer to <u>BRC-10</u> . No. Index" | <u>4, "DTC</u> |
| | |
| >> 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 <u>BI</u> "Description". | <u>RC-112.</u> |
| Is the symptom a normal operation? | |
| YES >> INSPECTION END | |
| NO $>>$ GO 10 5. | |
| J. CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION | |
| ABS warning lamp: Refer to BRC-90, "Description". | |
| Brake warning lamp: Refer to <u>BRC-91, "Description"</u> . | |
| VDC OFF indicator lamp: Refer to <u>BRC-92, "Description"</u>. VDC warning lamp: Refer to BRC-93, "Description". | |
| Is ON/OFF timing normal? | |
| YES >> GO TO 6. | |
| NO $>>$ GO 10 2. | |
| O.PERFORM THE DIAGNOSIS BY SYMPTOM | |
| Perform self-diagnosis for "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. | |
| | |
| >> GU IU 9. | |
| | |
| Perform the self-diagnosis again, and check that the malfunction is repaired completely. | |
| <u>IS NO OTHER DIC PRESENT and the repair completed?</u> | |
| NO $>>$ GO TO 3. | |

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

Diagnostic Work Sheet

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[VDC/TCS/ABS]

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

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| ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT | | | | | |
|---|--|--------|--|--|--|
| ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description | | | | | |
| After replacing the ABS actuator and electric unit (cont | rol unit), perform the neutral position adjustment for the | | | | |
| steering angle sensor. | | С | | | |
| ADDITIONAL SERVICE WHEN REPLACIN | NG CONTROL UNIT : Special Repair Re- | | | | |
| quirement | INFOID:000000006347656 | D | | | |
| 1.PERFORM THE NEUTRAL POSITION ADJUSTME | INT FOR THE STEERING ANGLE SENSOR | D | | | |
| Perform the neutral position adjustment for the steering | g angle sensor. | F | | | |
| >> Refer to BRC-9 "AD ILISTMENT OF STE | | | | | |
| <u>cial Repair Requirement"</u> . | | BR | | | |
| ADJUSTMENT OF STEERING ANGLE S | SENSOR NEUTRAL POSITION | BIX | | | |
| ADJUSTMENT OF STEERING ANGLE SE | NSOR NEUTRAL POSITION : Description | | | | |
| | INFOID:00000006347657 | G | | | |
| When doing work that applies to the list below, make a before running vehicle | sure to adjust neutral position of steering angle sensor | | | | |
| | ×: Required –: Not required | Н | | | |
| Situation | Adjustment of steering angle sensor neutral position | | | | |
| Removing/Installing ABS actuator and electric unit (control unit) | | 1 | | | |
| Replacing ABS actuator and electric unit (control unit) | × | | | | |
| Removing/Installing steering angle sensor | × | | | | |
| Replacing steering angle sensor | × | J | | | |
| Removing/Installing steering components | × | | | | |
| Replacing steering components | × | k | | | |
| Removing/Installing suspension components | × | rx | | | |
| Replacing suspension components | × | | | | |
| Change tires to new ones | | L | | | |
| Tire rotation | | | | | |
| Adjusting wheel alignment | × | в. / | | | |
| ADJUSTMENT OF STEERING ANGLE SE | NSOR NEUTRAL POSITION : Special Re- | IVI | | | |
| pair Requirement | INFOID:00000006347658 | | | | |
| ADJUSTMENT OF STEERING ANGLE SENSOR CAUTION: To adjust neutral position of steering angle sensor, (Adjustment cannot be done without CONSULT-III.) 1.ALIGN THE VEHICLE STATUS | NEUTRAL POSITION make sure to use CONSULT-III. | N O | | | |
| Stop the vehicle with front wheels in straight-ahead pos | sition. | Ρ | | | |
| | | | | | |
| >> GO TO 2. | | | | | |
| 2. PERFORM THE NEUTRAL POSITION ADJUSTME | INT FOR THE STEERING ANGLE SENSOR | | | | |
| Select "ABS", "WORK SUPPORT" and "ST ANGLE Select "START". | E SENSOR ADJUSTMENT" in order with CONSULT-III. | | | | |

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

INSPECTION AND ADJUSTMENT

[VDC/TCS/ABS]

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

CAUTION:

Do not 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 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 $: 0\pm 2.5^{\circ}$

Is the steering angle within the specified range?

YES >> GO TO 4.

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

4.ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memories for "ABS", "ENGINE" and "ICC" with CONSULT-III.

- "ABS": Refer to <u>BRC-31, "CONSULT-III Function"</u>.
- "ENGINE": Refer to EC-136. "CONSULT-III Function".
- "ICC": Refer to <u>CCS-39, "CONSULT-III Function (ICC/ADAS)"</u>.

Are the memories erased?

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

< SYSTEM DESCRIPTION > SYSTEM DESCRIPTION VDC

System Diagram



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System Description

[VDC/TCS/ABS]

- 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.

[VDC/TCS/ABS]

Component Parts Location

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VDC

Revision: 2011 October

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Front wheel sensor

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VDC

9.

Yaw rate/side G sensor

VDC OFF switch

8.

| < SYSTEM DESCRIPTION > | | | M DESCRIPTION > | | |
|------------------------|-------------------------------|----|-------------------------------|----|--|
| 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 (con- trol unit) |
| 7. | Front wheel sensor | 8. | VDC OFF switch | 9. | Yaw rate/side G sensor |
| 10. | Rear wheel sensor | | | | |
| Α. | Back of spiral cable assembly | В. | Combination meter | C. | Inside brake master cylinder cover |
| D. | Steering knuckle | E. | Instrument driver lower panel | F. | Under center console |

VDC

G. Rear final drive assembly

Component Description

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| Compo | Reference | F | |
|---|---|-----------------------|-----|
| | Pump | RPC-18 "Description" | |
| | Motor | | |
| | Actuator relay (main relay) | BRC-65, "Description" | BRC |
| ABS actuator and electric unit (control unit) | Solenoid valve | BRC-60, "Description" | |
| | Pressure sensor | BRC-67, "Description" | |
| | VDC switch-over valve (USV1, USV2, HSV1, HSV2) | BRC-75, "Description" | G |
| Wheel sensor | BRC-37, "Description" | — | |
| Yaw rate/side G sensor | BRC-72, "Description" | | |
| Steering angle sensor | | BRC-69, "Description" | |
| VDC OFF switch | BRC-88, "Description" | | |
| ABS warning lamp | BRC-90, "Description" | | |
| Brake warning lamp | BRC-91, "Description" | | |
| VDC OFF indicator lamp | BRC-92, "Description" | | |
| VDC warning lamp | BRC-93, "Description" | | |

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TCS

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System Description

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[VDC/TCS/ABS]

- 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.

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Component Parts Location

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- 4. VDC OFF indicator lamp
- 5. VDC warning lamp
- Brake warning lamp
- 6. ABS actuator and electric unit (control unit)

1.



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- 1. Steering angle sensor 2. ABS warning lamp 3. Brake warning lamp VDC OFF indicator lamp 5. VDC warning lamp 6. ABS actuator and electric unit (con-4. trol unit) VDC OFF switch 7. Front wheel sensor 8. 9. Yaw rate/side G sensor 10. Rear wheel sensor Α. Back of spiral cable assembly В. Combination meter C. Inside brake master cylinder cover Steering knuckle Ε. Instrument driver lower panel F. Under center console D.
- G. Rear final drive assembly

Component Description

| Component parts | | Reference |
|---|---|----------------------------|
| | Pump | PPC 49 "Description" |
| | Motor | <u>BRC-40, Description</u> |
| | Actuator relay (main relay) | BRC-65, "Description" |
| ABS actuator and electric unit (control unit) | Solenoid valve | BRC-60, "Description" |
| | Pressure sensor | BRC-67, "Description" |
| | VDC switch-over valve (USV1, USV2, HSV1, HSV2) | BRC-75, "Description" |
| Wheel sensor | | BRC-37, "Description" |
| Yaw rate/side G sensor | | BRC-72, "Description" |
| Steering angle sensor | | BRC-69, "Description" |
| VDC OFF switch | | BRC-88, "Description" |
| ABS warning lamp | | BRC-90, "Description" |
| Brake warning lamp | BRC-91, "Description" | |
| VDC OFF indicator lamp | | BRC-92, "Description" |
| VDC warning lamp | | BRC-93, "Description" |

Front LH wheel

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sensor

ABS System Diagram With LDP AWD ICC sensor Steering Lane ECM тсм control unit integrated unit angle sensor camera unit (With AWD) (With ICC) Injector operation signal CAN communication Front RH wheel sensor Yaw rate/side G sensor ABS actuator and VDC OFF switch electric unit (control unit) (LDP controller)

Without LDP Combination meter • Brake warning lamp • ABS warning lamp • VDC OFF indicator lamp ICC sensor AWD Steering Unified meter and ECM тсм control unit integrated unit A/C amp. angle sensor (With AWD) (With ICC) VDC warning lamp Injector operation signal CAN communication Front RH wheel sensor Yaw rate/side G sensor Rear RH wheel VDC OFF switch sensor ABS actuator and electric unit (control unit) ()Rear LH Front LH wheel wheel sensor sensor

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Unified meter and

A/C amp.

Combination meter Brake warning lamp ABS warning lamp VDC OFF indicator lamp

sensor

Rear LH

wheel sensor

JSFIA0776GB

Rear RH wheel

VDC warning lamp

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BRC

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System Description

INFOID:000000006347668

[VDC/TCS/ABS]

- 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 avoid-ing obstacles.
- Electrical system diagnosis by CONSULT-III is available.

Component Parts Location

INFOID:000000006880789



ABS

Revision: 2011 October

1.

4.



ABS

VDC OFF switch

8.

- itch
- 9. Yaw rate/side G sensor

[VDC/TCS/ABS]

| 1. 4. | Steering angle sensor VDC OFF indicator lamp | 2. 5. | ABS warning lamp VDC warning lamp | 3. 6. | Brake warning lamp ABS actuator and electric unit (con- trol unit) | А |
|-----------|---|----------|--|----------|--|---|
| 7. 10. | Front wheel sensor Rear wheel sensor | 8. | VDC OFF switch | 9. | Yaw rate/side G sensor | В |
| A. D. | Back of spiral cable assembly Steering knuckle | B. E. | Combination meter Instrument driver lower panel | C. F. | Inside brake master cylinder cover Under center console | С |

ABS

G. Rear final drive assembly

Component Description

INFOID:00000006347670

| Component parts | | Reference | F |
|---|---|-----------------------|-----|
| | Pump | BRC-48 "Description" | |
| | Motor | | |
| | Actuator relay (main relay) | BRC-65, "Description" | BRC |
| ABS actuator and electric unit (control unit) | Solenoid valve | BRC-60, "Description" | |
| | Pressure sensor | BRC-67, "Description" | |
| | VDC switch-over valve (USV1, USV2, HSV1, HSV2) | BRC-75, "Description" | G |
| Wheel sensor | | BRC-37, "Description" | — |
| Yaw rate/side G sensor | | BRC-72, "Description" | |
| Steering angle sensor | | BRC-69, "Description" | |
| VDC OFF switch | | BRC-88, "Description" | |
| ABS warning lamp | | BRC-90, "Description" | |
| Brake warning lamp | BRC-91, "Description" | | |
| VDC OFF indicator lamp | | BRC-92, "Description" | J |
| VDC warning lamp | | BRC-93, "Description" | |

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EBD

INFOID:000000006880790



EBD

System Description

• 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.

INFOID:000000006347672

[VDC/TCS/ABS]

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Component Parts Location

INFOID:000000006880791



- 4. VDC OFF indicator lamp
- 5. VDC warning lamp
- Brake warning lamp
- 6. ABS actuator and electric unit (control unit)

1.



[VDC/TCS/ABS]

INFOID:000000006347674

- 1. Steering angle sensor 2. ABS warning lamp 3. Brake warning lamp VDC OFF indicator lamp 5. VDC warning lamp 6. ABS actuator and electric unit (con-4. trol unit) 7. Front wheel sensor 8. VDC OFF switch 9. Yaw rate/side G sensor 10. Rear wheel sensor Α. Back of spiral cable assembly В. Combination meter C. Inside brake master cylinder cover Steering knuckle Ε. Instrument driver lower panel F. Under center console D.
- G. Rear final drive assembly

Component Description

| Component parts | | Reference | |
|---|---|-----------------------|--|
| | Pump | BBC-18 "Description" | |
| | Motor | | |
| | Actuator relay (main relay) | BRC-65, "Description" | |
| ABS actuator and electric unit (control unit) | Solenoid valve | BRC-60, "Description" | |
| | Pressure sensor | BRC-67, "Description" | |
| | VDC switch-over valve (USV1, USV2, HSV1, HSV2) | BRC-75, "Description" | |
| Wheel sensor | | BRC-37, "Description" | |
| Yaw rate/side G sensor | | BRC-72, "Description" | |
| Steering angle sensor | | BRC-69, "Description" | |
| VDC OFF switch | | BRC-88, "Description" | |
| ABS warning lamp | BRC-90, "Description" | | |
| Brake warning lamp | BRC-91, "Description" | | |
| VDC OFF indicator lamp | BRC-92, "Description" | | |
| VDC warning lamp | | BRC-93, "Description" | |

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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

CONSULT-III Function

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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. | D |
| 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. | F |
| 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. | BR |
| Special Function | Specific LDP data in the ABS actuator and electric unit (control unit) can be read. | |

WORK SUPPORT

CAUTION:

Erase DTC memory of the lane camera unit after implementing work support. Refer to <u>DAS-270, "CON-</u><u>SULT-III Function (LANE CAMERA)"</u>.

| 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 for "ABS" with CONSULT-III, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

Display Item List Refer to BRC-104, "DTC No. 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 in "ON" position.

DATA MONITOR

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

 \times : Applicable \blacksquare : Optional item

| SELECT MONITOR ITEM | | | |
|--------------------------------------|----------------------|--------------|--|
| Monitor item (Unit) | ECU INPUT SIGNALS | MAIN SIGNALS | Remarks |
| FR LH SENSOR [km/h (MPH)] | × | × | |
| FR RH SENSOR [km/h (MPH)] | × | × | Wheel speed |
| RR LH SENSOR [km/h (MPH)] | × | × | Wheel speed |
| 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) |
| GEAR | × | × | Gear position determined by TCM |
| SLCT LVR POSI | × | × | A/T selector lever position |
| 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 |
| LDP) APP SEN (%) (Note 2) | × | × | Accelerator pedal position sensor status received from ECM via CAN communication |
| FR RH IN SOL (On/Off) (Note 1) | ▼ | × | |
| FR RH OUT SOL (On/Off) (Note 1) | ▼ | × | |
| FR LH IN SOL (On/Off) (Note 1) | ▼ | × | |
| FR LH OUT SOL (On/Off) (Note 1) | ▼ | × | Operation status of each solenoid valve |
| 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 |

Revision: 2011 October

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

| | SELECT MONITOR ITEM | | | |
|---|----------------------|--------------|--|--------------|
| Monitor item (Unit) | ECU INPUT SIGNALS | MAIN SIGNALS | Remarks | A |
| ACTUATOR RLY (On/Off) (Note 1) | ▼ | × | Actuator relay operation | В |
| ABS WARN LAMP (On/Off) | ▼ | × | ABS warning lamp | |
| OFF LAMP (On/Off) | ▼ | × | VDC OFF indicator lamp | С |
| SLIP/VDC (On/Off) | ▼ | × | VDC warning lamp | D |
| EBD SIGNAL (On/Off) | ▼ | • | EBD operation | |
| ABS SIGNAL (On/Off) | ▼ | ▼ | ABS operation | E |
| TCS SIGNAL (On/Off) | ▼ | ▼ | TCS operation | BRC |
| VDC SIGNAL (On/Off) | ▼ | • | VDC operation | |
| EBD FAIL SIG (On/Off) | ▼ | • | EBD fail-safe signal | G |
| ABS FAIL SIG (On/Off) | ▼ | • | ABS fail-safe signal | Н |
| TCS FAIL SIG (On/Off) | ▼ | • | TCS fail-safe signal | |
| VDC FAIL SIG (On/Off) | ▼ | • | VDC fail-safe signal | Ι |
| CRANKING SIG (On/Off) | ▼ | • | Crank operation | J |
| USV[FR-RL] (On/Off) (Note 1) | ▼ | • | | |
| USV[FL-RR] (On/Off) (Note 1) | ▼ | • | VDC switch over volve | K |
| HSV[FR-RL] (On/Off) (Note 1) | ▼ | • | | L |
| HSV[FL-RR] (On/Off) (Note 1) | ▼ | • | | |
| V/R OUTPUT (On/Off) | ▼ | • | Solenoid valve relay activated | \mathbb{M} |
| M/R OUTPUT (On/Off) | ▼ | • | Actuator motor and motor relay activated | N |
| LDP) APP SEN (%) (Note 2) | × | × | Accelerator pedal position sensor status received from ECM via CAN communication | IN |
| LDP) ICC MAIN SW (On/Off) (Note 2) | × | × | ICC MAIN switch status received from ECM via CAN com- munication | 0 |
| LDP) LDP ON SW (On/Off) (Note 2) | × | × | Dynamic driver assistance switch status received from ECM via CAN communication | D |
| LDP) WIPER SIGNAL (Stop/PRTCT/1low/1high/Low/High) (Note 2) | × | × | Front wiper operating condition received from BCM via CAN communication | Ρ |
| LDP) BRAKE SW (On/Off) (Note 2) | × | × | Brake switch signal status | |
| LDP) STOP LMP SW (On/Off) (Note 2) | × | × | Stop lamp switch signal status | |

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

| | SELECT MONITOR ITEM | | | |
|--|----------------------|--------------|--|--|
| Monitor item (Unit) | ECU INPUT SIGNALS | MAIN SIGNALS | Remarks | |
| LDP) LDW SW (On/Off) (Note 2) | × | × | Warning systems switch status received from lane camera unit via CAN communication | |
| LDP) SHIFT POSITION (OFF/P/R/N/D/MM 1st – MM 5th) (Note 2) | × | × | Shift position received from TCM via CAN communication | |
| LDP) TURN SIGNAL (Off/LH/RH/LH&RH) (Note 2) | × | × | Turn signal operating condition received from BCM via CAN communication | |

NOTE:

1: 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.

2: With LDP models.

ACTIVE TEST

CAUTION:

- Do not perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.
- The active test cannot be 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.
- Erase memory of ICC system after implementing active test. Refer to <u>CCS-39, "CONSULT-III Function</u> (ICC/ADAS)".
- Erase memory of the lane camera unit after implementing active test. Refer to <u>DAS-270, "CONSULT-</u> <u>III Function (LANE CAMERA)"</u>.

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" in "ABS" with CONSULT-III is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" in "ABS" with CONSULT-III is displayed, to perform test again.

Test Item

ABS SOLENOID VALVE

• Select "Up", "Keep" and "Down" of "ACTIVE TEST" in "ABS" with CONSULT-III. Then use screen monitor to check that solenoid valve operates as shown in the table below.

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

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

< SYSTEM DESCRIPTION >

| Test item | Display item | Display (Note) | | | - |
|-----------|---------------|----------------|------|------|---|
| | | Up | Keep | Down | ŀ |
| RR LH SOL | RR LH IN SOL | Off | On | On | |
| | RR LH OUT SOL | Off | Off | On* | E |
| | 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" of "ACTIVE TEST" in "ABS" with CONSULT-III. 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 | - BRC |
| FR RH ABS SOLENOID (ACT) | FR RH IN SOL | Off | Off | Off | |
| | FR RH OUT SOL | Off | Off | Off | G |
| | USV[FR-RL] | Off | On | On | |
| | HSV[FR-RL] | Off | On* | Off | |
| FR LH ABS SOLENOID (ACT) | FR LH IN SOL | Off | Off | Off | Η |
| | FR LH OUT SOL | Off | Off | Off | |
| | USV[FL-RR] | Off | On | On | |
| | HSV[FL-RR] | Off | On* | Off | |
| RR RH ABS SOLENOID (ACT) | RR RH IN SOL | Off | Off | Off | |
| | RR RH OUT SOL | Off | Off | Off | J |
| | USV[FL-RR] | Off | On | On | |
| | HSV[FL-RR] | Off | On* | Off | |
| RR LH ABS SOLENOID (ACT) | RR LH IN SOL | Off | Off | Off | - r |
| | RR LH OUT SOL | Off | Off | Off | |
| | USV[FR-RL] | Off | On | On | L |
| | 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" of "ACTIVE TEST" in "ABS" with CONSULT-III on screen. Make sure motor relay and actuator relay operates as shown in table below.

| Test item | Display item | Display | | |
|-----------|---------------------|---------|-----|--|
| | Display item | 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

BRC-35

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[VDC/TCS/ABS]

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

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

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

SPECIAL FUNCTION

Specific Data Monitor

Specific data monitor displays specific LDP operating conditions.

| Monitor item (Unit) | Remarks | |
|---|---|--|
| YAW RATE SEN (d/s) | Yaw rate detected by yaw rate/side G sensor | |
| LDP) YAW ORDER (×100Nm) | Calculated target yaw moment | |
| LDP) WARN REQ (On/Off) | Status of warning request that transmits to lane camera unit via CAN communication | |
| LDP) WARN CONTROL (On/Off) | Status of warning main controller for LDP | |
| LDP) REDY SIGNAL (On/Off) | Status of internal judgment by LDP controller [ABS actuator and electric unit (control unit)] | |
| LDP) STATUS SIGNAL (STANDBY/WARN/MASK/Off) | Status of internal judgment by LDP controller [ABS actuator and electric unit (control unit)] | |
| LDP) CAMERA LOST (Detect/Deviate/Both) | Lane marker detected condition received from lane camera unit via CAN communication | |
| LDP) LANE UNCLEAR (On/Off) | Lane marker condition received from lane camera unit via CAN communication | |
C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR

Description

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

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. | E |
| C1102 | RR LH SENSOR-1 | Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard. | Harness or connectorWheel sensor |
| C1103 | FR RH SENSOR-1 | Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard. | ABS actuator and electric unit (control unit) |
| C1104 | FR LH SENSOR-1 | Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard. | G |
| DTC CC | NFIRMATION PROCE | DURE | |
| 1. DTC I | REPRODUCTION PROCE | EDURE | ŀ |
| 1. Start 2. Perfo | the engine and drive the orm self-diagnosis for "AB | vehicle at 30 km/h (19 MPH) or more for approx S" with CONSULT-III. | imately 1 minute. |
| Is DTC "(| <u>C1101", "C1102", "C1103"</u> | or "C1104" detected? | |
| NO | >> Proceed to diagnosis. >> INSPECTION END | Refer to <u>BRC-37, "Diagnosis Procedure"</u> . | |
| Diagno | sis Procedure | | INFOID:00000006347678 |
| CAUTION Never ch 1.CHEC | <mark>N:</mark> n eck between wheel sen CK WHEEL SENSOR | sor harness connector terminals. | Ч |
| 1. Turn | the ignition switch OFF. | 20 | L |
| Is the ins | pection result normal? | ye. | |
| YES | >> GO TO 3. | | Ν |
| NO | >> GO TO 2. | | |
| 2.REPL | ACE WHEEL SENSOR (1 |) | N |
| Repl Fron Rear Eras Turn | ace wheel sensor. t: Refer to <u>BRC-116, "FRC</u> r: Refer to <u>BRC-117, "REA</u> e Self-diagnosis result for the ignition switch OFF, a | ONT WHEEL SENSOR : Removal and Installation R WHEEL SENSOR : Removal and Installation "ABS". Ind wait 10 seconds or more. | <u>on"</u> . <u>"</u> . () |
| Stat Drive Stop Stop Perfe | the engine. • the vehicle at approx. 30 the vehicle. prm self-diagnosis for "AB |) km/h (19 MPH) or more for approx. 1 minute. S" with CONSULT-III. | F |
| <u>ls DTC "(</u> | <u>C1101", "C1102", "C1103"</u> | or "C1104" detected? | |
| YES NO | >> GO TO 3. >> INSPECTION END | | |
| 3. CHEC | CK CONNECTOR | | |

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C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 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. Stat 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. Stat 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.)

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

Measurement connector and terminal for power supply circuit

C1101, C1102, C1103, C1104 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

| Measurement connect | or and terminal for signal circ | | | |
|---|---------------------------------|----------------------------|------------------------------|------------------------|
| ABS actuator and el | ectric unit (control unit) | Whee | l sensor | Continuity |
| Connector | Terminal | Connector | Terminal | Continuity |
| | 5 | E60 (Front LH) | | |
| F 44 | 10 | E27 (Front RH) | | Eviated |
| E41 | 27 | B34 (Rear LH) | Ζ | EXISIEU |
| | 29 | B33 (Rear RH) | | |
| Is the inspection resu | It normal? | | | |
| YES >> GO TO 9 |). | | | |
| NO >> Repair or | r replace error-detecte | d parts and GO TO 8. | | |
| 8.PERFORM SELF- | ·DIAGNOSIS (3) | | | |
| 1. Connect ABS act | tuator and electric unit | (control unit) harness | connector. | |
| 2. Connect wheel s | ensor harness connec | tor. | | |
| Erase Self-diagn Turn the ignition | osis result for "ABS". | 10 seconds or moro | | |
| 5. Stat the engine | Switch OFF, and wall | | | |
| 6. Drive the vehicle | at approx. 30 km/h (1 | 9 MPH) or more for ap | prox. 1 minute. | |
| 7. Stop the vehicle. | | | | |
| | Inosis for ABS" with C | VINSULI-III. | | |
| | <u>102", "C1103" of "C110</u> | <u>14" detected ?</u> | | |
| NO >> INSPEC | | | | |
| | | | | |
| C.REFLACE WHEL | | | | |
| Replace wheel set – Front: Refer to R | ensor. RC-116 "FRONT WH | FEL SENSOR · Remo | val and Installation" | |
| Rear: Refer to BI | RC-117, "REAR WHE | EL SENSOR : Remova | al and Installation". | |
| 2. Erase Self-diagn | osis result for "ABS" w | ith CONSULT-III. | | |
| Turn the ignition Stat the engine | switch OFF, and wait 1 | 10 seconds or more. | | |
| 5. Drive the vehicle | at approx. 30 km/h (1 | 9 MPH) or more for ap | prox. 1 minute. | |
| 6. Stop the vehicle. | | - , | | |
| 7. Perform self-diag | nosis for "ABS" with C | CONSULT-III. | | |
| <u>Is DTC "C1101", "C11</u> | 02", "C1103" or "C110 | <u>)4" detected?</u> | | |
| YES >> Replace | ABS actuator and elec | ctric unit (control unit). | Refer to <u>BRC-119, "Ex</u> | <u>ploded View"</u> . |
| | | | | |
| Special Repair R | equirement | | | INFOID:000000006347679 |
| | E STEERING ANGLE | | | |
| | | | | |
| Always perform the n | eutral position adjustr | | NT OF STEERING AN | IGLE SENSOR NELL |
| TRAL POSITION : De | escription". | DIG 0, ADJOUTHE | IN OF OTLENING AN | |
| | · | | | |
| >> END | | | | |
| | | | | |

Ρ

< DTC/CIRCUIT DIAGNOSIS >

C1105, C1106, C1107, C1108 WHEEL SENSOR

Description

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:000000006347681

INFOID:00000006347680

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-cir- cuited. 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. | |
| C1106 | RR LH SENSOR-2 | When the circuit in the rear LH wheel sensor is short-cir- cuited. 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 connectorWheel sensor |
| C1107 | FR RH SENSOR-2 | When the circuit in the front RH wheel sensor is short-cir- cuited. 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. | ABS actuator and electric unit (control unit) |
| C1108 | FR LH SENSOR-2 | When the circuit in the front LH wheel sensor is short-cir- cuited. 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. Refer to <u>BRC-40, "Diagnosis Procedure"</u>.

NO >> INSPECTION ĔND

Diagnosis Procedure

INFOID:000000006347682

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 <u>BRC-84, "Diagnosis Proce-</u> dure".

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.

| < DTC/CIRCUIT DIAGNOSIS > | [VDC/TCS/ABS] |
|---|--|
| Stat the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", and "RR RH SENSOR" with CONSULT-III. NOTE: | "RR LH SENSOR" A |
| Set the "DATA MONITOR" recording speed to "10 msec".5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel s | ensor. B |
| Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected by wheel sensor and the maximum/minimum wheel speed detected by the normal wheel se ence within 5%, respectively? | <u>the error detecting</u> nsors, is the differ- C |
| YES >> GO TO 4. NO >> GO TO 5. | _ |
| 4.PERFORM SELF-DIAGNOSIS (1) | D |
| Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT-III. Is DTC "C1105", "C1106", "C1107" or "C1108" detected? | E |
| YES >> GO TO 5. | BR |
| NO >> INSPECTION END | |
| J.CHECK WHEEL SENSOR | G |
| Check wheel sensor for damage. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust co wheel sensor mounting hole. CAUTION: | ollector through the |
| Install wheel sensor with no backlash and float, and tighten the mounting bol | t to the specified |
| torque. Front: Refer to <u>BRC-116, "FRONT WHEEL SENSOR : Exploded View"</u>. | I |
| • Rear: Refer to <u>BRC-117, "REAR WHEEL SENSOR : Exploded View"</u> . | |
| YES >> GO TO 8. NO >> GO TO 6. | J |
| 6. REPLACE WHEEL SENSOR (1) | K |
| Replace wheel sensor. Front: Refer to <u>BRC-116</u>, "FRONT WHEEL SENSOR : Removal and Installation". Rear: Refer to <u>BRC-117</u>, "<u>REAR WHEEL SENSOR</u> : <u>Removal and Installation</u>". Erase Self-diagnosis result for "ABS" with CONSULT-III. Turn the ignition switch OFE and wait 10 seconds or more. | L |
| Stat the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", and "RR RH SENSOR" with CONSULT-III. NOTE: | "RR LH SENSOR" M |
| Set the "DATA MONITOR" recording speed to "10 msec". 6 Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel s | 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 se ence within 5%, respectively? | nsors, is the differ- |
| NO $>>$ GO TO 19. | _ |
| 7.PERFORM SELF-DIAGNOSIS (2) | Р |
| With CONSULT-III. Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT-III. <u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u> YES >> GO TO 19. | |

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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. Stat the engine.
- Select "ABŠ" 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. Stat the engine.
- 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. |
|-----|-----------|-----|
| | ~ ~ ~ ~ ~ | |

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

| 13.PERFORM SELF-DIA | GNOSIS (4) | | | \ \ | |
|---|---|--|---|--------|--|
| Drive the vehicle at app Stop the vehicle. | Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. | | | | |
| 3. Perform self-diagnosis | 3. Perform self-diagnosis for "ABS" with CONSULT-III. | | | | |
| <u>Is DTC "C1105", "C1106", "C</u> | <u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u> | | | | |
| YES >> GO TO 14. | | | | | |
| | | | C |) | |
| | | | | | |
| Turn the ignition switch Disconnect ABS actuat Disconnect wheel sens Check continuity betwe | OFF. or and electric unit (control or harness connector. en ABS actuator and electr | unit) harness connector. ic unit (control unit) harness | connector and the ground. |) | |
| ABS actuator and ele | ctric unit (control unit) | | | - | |
| Connector | Terminal | — | Continuity | | |
| | 26, 5 | | BR | RC | |
| | 9, 10 | | | | |
| E41 | 6, 27 | Ground | Not existed | | |
| · | 7, 29 | | G | ò | |
| YES >> GO TO 15. NO >> Repair or replace 15. CHECK DATA MONIT 1. Connect ABS actuator 2. Connect wheel sensor | ce error-detected parts and OR (4) and electric unit (control uni parness connector | GO TO 15. it) harness connector. | H | - | |
| Erase Self-diagnosis re Turn the ignition switch Stat the engine. Select "ABS" and "DAT and "RR RH SENSOR" NOTE: | Sult for "ABS" with CONSU OFF, and wait 10 seconds A MONITOR", check "FR I with CONSULT-III. | LT-III. or more. LH SENSOR", "FR RH SE | J NSOR", "RR LH SENSOR" K | J | |
| Set the "DATA MONITO 7. Read a value (wheel sp <u>Regarding the deference a</u> <u>wheel sensor and the maxi</u> <u>ence within 5%, respectively</u> | DR" recording speed to "10 need) of both normal wheel to 30 km/h (19 MPH) betword mum/minimum wheel speed of the speed of | msec". sensors and error-detecting een the wheel speed dete ed detected by the normal v | g wheel sensor. cted by the error detecting wheel sensors, is the differ- | - | |
| NO >> GO TO 16. | | | IV | /1 | |
| 16.PERFORM SELF-DIA | GNOSIS (5) | | | | |
| Drive the vehicle at app Stop the vehicle. Perform self-diagnosis | for "ABS" with CONSULT-II | nore for approx. 1 minute. | N | 0 | |
| <u>IS DIC "C1105", "C1106", "(</u> | JTTU/ or "U1108" detected | <u>! (</u> | | ٣ | |
| NO >> INSPECTION E | | | P | C | |
| Replace wheel sensor. Front: Refer to <u>BRC-11</u> Rear: Refer to <u>BRC-117</u> Erase Self-diagnosis re | 6. "FRONT WHEEL SENSO 7. "REAR WHEEL SENSOF sult for "ABS" with CONSU | <u>DR : Exploded View"</u> . <u>R : Exploded View"</u> . LT-III. | | | |

- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Stat the engine.

BRC-43

< DTC/CIRCUIT DIAGNOSIS >

 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.

<u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u>

YES >> GO TO 19.

NO >> INSPECTION END

19.REPLACE SENSOR ROTOR

- 1. Replace sensor rotor.
- Front: Refer to BRC-118, "FRONT SENSOR ROTOR : Exploded View".
- Rear: Refer to <u>BRC-118</u>, "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. Stat 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 <u>BRC-119, "Exploded View"</u>.
- NO >> INSPECTION END

Special Repair Requirement

INFOID:000000006347683

[VDC/TCS/ABS]

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Description"</u>.

>> END

| C1109 | POWER AND | GROUND S | SYSTE | M | | | Δ |
|------------------------------|---|---|-------------------------------|--|---------|---|----|
| Descrip | otion | | | | | INFOID:00000006347684 | A |
| Supplies | electric power to the . O gic | ABS actuator and | l electric u | nit (control unit). | | INFOID:00000006347685 | В |
| DTC DE | TECTION LOGIC | | | | | | С |
| DTC | Display item | M | alfunction de | etected condition | | Possible cause | |
| C1109 | BATTERY VOLTAGE [ABNORMAL] | When the ABS power supply v | actuator an voltage is lov | d electric unit (control ver than normal. | unit) | Harness or connector ABS actuator and electric unit (control unit) | D |
| DTC CC | NFIRMATION PRO | CEDURE | | | | | Е |
| 1.DTC | REPRODUCTION PR | OCEDURE | | | | | |
| 1. Turn 2. Perfe | the ignition switch OF orm self-diagnosis for C1109" detected? | F to ON. "ABS" with CONS | SULT-III. | | | | BR |
| YES NO | >> Proceed to diagno >> INSPECTION ENI | sis procedure. Re D | efer to <u>BR</u> | C-45, "Diagnosis F | Procedu | <u>ire"</u> . | G |
| Diagno | sis Procedure | | | | | INFOID:00000006347686 | Н |
| 1. CHEC | CK CONNECTOR | | | | | | 11 |
| 1. Turn 2. Disc 3. Che | the ignition switch OF onnect ABS actuator ck terminal for deform | F. and electric unit (ation, disconnecti | control uni on, looser | it) harness connec ness, etc. | tor. | | I |
| Is the ins | spection result normal | <u>?</u> | | | | | J |
| NO | >> Repair or replace | error-detected pa | rts. | | | | |
| 2.снес | CK ABS ACTUATOR A | ND ELECTRIC L | JNIT (COI | NTROL UNIT) PO | WER S | UPPLY | К |
| 1. Che | ck the voltage betwee | n ABS actuator a | nd electric | unit (control unit) | harnes | s connector and ground. | |
| ABS actu | uator and electric unit (cont | rol unit) | | Condition | V | | L |
| Con | nector Termin | al | _ | Condition | v | | |
| E | E41 28 | Grou | und | Ignition switch: OFF | Арр | prox. 0 V | M |
| 2. Turn CAL | the ignition switch Of JTION: | ۱. | | | | | |

Never start the engine.

Ν 3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

| ABS actuator and electric unit (control unit) | | | Condition | Voltage |
|---|----|--------|---------------------|-----------------|
| Connector Terminal | | | Condition | voltage |
| E41 | 28 | Ground | Ignition switch: ON | Battery voltage |

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

$\mathbf{3.}$ check abs actuator and electric unit (control unit) power supply circuit

BRC-45

1. Turn the ignition switch OFF.

2. Check 10A fusible link (45).

3. Disconnect IPDM E/R harness connector.

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

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[VDC/TCS/ABS]

C1109 POWER AND GROUND SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

4. Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R harness connector.

| ABS actuator and ele | ectric unit (control unit) | IPDI | M E/R | Continuity |
|----------------------|----------------------------|--------------------|-------|------------|
| Connector | Terminal | Connector Terminal | | Continuity |
| E41 | 28 | E5 | 25 | Existed |

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to <u>PG-71, "Wiring Diagram -</u> <u>IGNITION POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

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

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

| ABS actuator and ele | ectric unit (control unit) | | Continuity | |
|----------------------|----------------------------|--------|------------|--|
| Connector | Terminal | | Continuity | |
| E/1 | 1 | Ground | Existed | |
| L41 | 4 | Ground | LAIsteu | |

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts. (Check ABS earth bolt for tightness and corrosion.)

Special Repair Requirement

INFOID:000000006347687

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: Description".

>> END

C1110, C1153, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]

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

DTC Logic

INFOID:00000006347688

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В

DTC DETECTION LOGIC

| | | | | ~ |
|---|--|--|--|-----|
| DTC | Display item | Malfunction detected condition | Possible cause | С |
| C1110 | CONTROLLER FAILURE | When there is an internal malfunction in the ABS actuator and electric unit (control unit). | | D |
| C1153 | EMERGENCY BRAKE | When ABS actuator and electric unit (control unit) is mal- functioning. (Pressure increase is too much or too little) | ABS actuator and electric unit (control unit) | D |
| C1170 | VARIANT CODING | In a case where VARIANT CODING is different. | | F |
| DTC CC | NFIRMATION PROCEI | DURE | | |
| 1. DTC | REPRODUCTION PROCE | EDURE | | |
| 1. Turn 2. Perfe <u>Is DTC "</u> | the ignition switch ON. orm self-diagnosis for "AB C1110", "C1153" or "C1170 | S" with CONSULT-III. <u>)" detected?</u> | | DRC |
| YES NO | >> Proceed to diagnosis p >> INSPECTION END | procedure. Refer to <u>BRC-47, "Diagnosis Proced</u> | ure". | G |
| Diagno | sis Procedure | | INFOID:00000006347689 | Н |
| 1. REPL | ACE ABS ACTUATOR AN | ND ELECTRIC UNIT (CONTROL UNIT) | | |
| CAUTIO Replace than tho | N: ABS actuator and elect se applicable. | tric unit (control unit) when self-diagnostic | result shows items other | |
| | >> Replace ABS actuator | and electric unit (control unit). | | J |
| Specia | l Repair Requiremer | nt | INFOID:00000006347690 | K |
| 1.ADJU | STMENT OF STEERING | ANGLE SENSOR NEUTRAL POSITION | | |
| Always p tor and e <u>TRAL PC</u> | perform the neutral position electric unit (control unit). DSITION : Description". | n adjustment for the steering angle sensor, whe Refer to <u>BRC-9, "ADJUSTMENT OF STEERIN</u> | n replacing the ABS actua- IG ANGLE SENSOR NEU- | L |
| | >> END | | | Μ |
| | | | | Ν |
| | | | | 0 |
| | | | | |
| | | | | |

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description

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:000000006347692

INFOID:00000006347693

DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|-------|--------------|--|---|
| C1111 | | During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open. | Harness or connector ABS actuator and electric 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. | (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 "C1111" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-48</u>, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

2. Disconnect ABS actuator and electric unit (control unit) connector.

3. Check terminal for deformation, disconnect, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

 $\mathbf{3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

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

BRC-48

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

| ABS actuator and ele | ectric unit (control unit) | | Continuity | |
|----------------------|----------------------------|--------|------------|--|
| Connector | Terminal | | Continuity | |
| E/1 | 1 | Ground | Existed | |
| 241 | 4 | Ground | LAISIEU | |

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:000000006347694

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9. "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-</u> <u>TRAL POSITION : Description"</u>.

>> END

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< DTC/CIRCUIT DIAGNOSIS >

C1115 WHEEL SENSOR

Description

INFOID:000000006347699

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:000000006347700

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.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. Refer to <u>BRC-50, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006347701

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 <u>BRC-84, "Diagnosis Proce-dure"</u>.

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. Stat the engine.
- Select "ABŠ" 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.

BRC-50

C1115 WHEEL SENSOR

| < DTC/CIRCUIT DIAGNOSIS > | [VDC/TCS/ABS] |
|---|---|
| 4.PERFORM SELF-DIAGNOSIS (1) | |
| Drive the vehicle at approx. 30 km/h (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT-III. <u>Is DTC "C1115" detected?</u> YES >> GO TO 5. NO >> INSPECTION END CHECK WHEEL SENSOR | |
| Turn the ignition switch OFF. Check wheel sensor for damage. Remove dust and foreign matter adhered to the sensor rotor with a vacuum dust wheel sensor mounting hole. CAUTION: Install wheel sensor with no backlash and float, and tighten the mounting k torque. Front: Refer to <u>BRC-116, "FRONT WHEEL SENSOR : Exploded View"</u>. | collector through the collector through the collector through the collector the specified |
| Is the inspection result normal? YES >> GO TO 8. NO >> GO TO 6. 6. 6. | |
| Replace wheel sensor. Front: Refer to <u>BRC-116, "FRONT WHEEL SENSOR : Exploded View"</u>. Rear: Refer to <u>BRC-117, "REAR WHEEL SENSOR : Exploded View"</u>. Erase Self-diagnosis result for "ABS" with CONSULT-III. Turn the ignition switch OFF, and wait 10 seconds or more. | |
| Stat the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR and "RR RH SENSOR" with CONSULT-III. NOTE: Set the "DATA MONITOR" recording speed to "10 msec". | ", "RR LH SENSOR" |
| 6. Read a value (wheel speed) of both normal wheel sensors and error-detecting whee Regarding the deference at 30 km/h (19 MPH) between the wheel speed detected b wheel sensor and the maximum/minimum wheel speed detected by the normal wheel ence within 5%, respectively? | I sensor. by the error detecting sensors, is the differ- |
| YES >> GO TO 7. NO >> GO TO 19. 7 | |
| PERFORM SELF-DIAGNOSIS (2) Drive the vehicle at approx. 20 km/h (10 MDH) or more for approx. 1 minute | |
| Drive the vehicle at approx. 30 km/n (19 MPH) or more for approx. 1 minute. Stop the vehicle. Perform self-diagnosis for "ABS" with CONSULT-III. <u>Is DTC "C1115" detected?</u> | |

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)

Erase Self-diagnosis result for "ABS" with CONSULT-III. 1.

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C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 2. Turn the ignition switch OFF, and wait 10 seconds or more.
- 3. Stat the engine.
- 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. Stat the engine.
- 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.

BRC-52

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- 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.)

| Connector | ABS actuator and electric unit (control unit) | | Wheel sensor | |
|--|--|--|---|--|
| | Terminal | Connector | Terminal | Continuity |
| | 26 | E60 (Front LH) | | |
| E41 | 9 | E27 (Front RH) | | |
| | 6 | B34 (Rear LH) | 1 | Existed |
| | 7 | B33 (Rear RH) | | |
| Measurement connect | or and terminal for signal circ | uit | | |
| ABS actuator and ele | ectric unit (control unit) | Wheels | sensor | Continuity |
| Connector | Terminal | Connector | Terminal | Continuity |
| | 5 | E60 (Front LH) | | |
| F 44 | 10 | E27 (Front RH) | 0 | Estimate d |
| E41 | 27 | B34 (Rear LH) | 2 | Existed |
| | 29 | B33 (Rear RH) | | |
| Check continuity | between ABS actuator | r and electric unit (cont | rol unit) harness con | nector and the ground. |
| | APC activator and sta | otrio unit (control unit) | | |
| Connector | | | Torminal | Continuity |
| Connector | | Connector | Terrinia | |
| | 20,3 | | | |
| E41 | 9, 10 | E41 1, 4 | 1, 4 | Not existed |
| | 6, 27 | | | |
| | 7, 29 | | | |
| | 5. | | | |
| YES >> GO TO 1 NO >> Repair or 5. CHECK DATA M Connect ABS act Connect wheel s Erase Self-diagn Turn the ignition | r replace error-detected IONITOR (4) tuator and electric unit ensor harness connect osis result for "ABS" wi switch OFF, and wait 1 | d parts and GO TO 15. (control unit) harness of for. ith CONSULT-III. 0 seconds or more. | connector. | |
| YES >> GO TO 1 NO >> Repair of 5.CHECK DATA N Connect ABS act Connect wheel s Erase Self-diagn Turn the ignition Stat the engine. Select "ABS" and and "RR RH SEN NOTE: Set the "DATA M | r replace error-detected IONITOR (4) tuator and electric unit ensor harness connect osis result for "ABS" wi switch OFF, and wait 1 d "DATA MONITOR", of ISOR" with CONSULT- ONITOR" recording sp | d parts and GO TO 15. (control unit) harness of for. Ith CONSULT-III. 0 seconds or more. check "FR LH SENSO -III. eed to "10 msec". | connector. R", "FR RH SENSO | R", "RR LH SENSOR" |
| YES >> GO TO 1 NO >> Repair or 5.CHECK DATA N . Connect ABS act . Connect wheel so . Erase Self-diagn . Turn the ignition . Stat the engine. . Select "ABS" and and "RR RH SEN NOTE: Set the "DATA M . Read a value (wh | r replace error-detected IONITOR (4) tuator and electric unit ensor harness connect osis result for "ABS" wi switch OFF, and wait 1 d "DATA MONITOR", of ISOR" with CONSULT- ONITOR" recording sp neel speed) of both nor | d parts and GO TO 15. (control unit) harness of for. ith CONSULT-III. 0 seconds or more. check "FR LH SENSO -III. eed to "10 msec". mal wheel sensors and | connector. R", "FR RH SENSO d error-detecting whe | R", "RR LH SENSOR" eel sensor. |
| YES >> GO TO 1 NO >> Repair or 5. CHECK DATA N . Connect ABS act . Connect wheel s . Erase Self-diagn . Turn the ignition . Stat the engine. . Select "ABS" and and "RR RH SEN NOTE: Set the "DATA M . Read a value (wh egarding the defere | r replace error-detected IONITOR (4) tuator and electric unit ensor harness connect osis result for "ABS" wi switch OFF, and wait 1 d "DATA MONITOR", of ISOR" with CONSULT- ONITOR" recording sp neel speed) of both nor ance at 30 km/h (19 N | d parts and GO TO 15. (control unit) harness of or. Ith CONSULT-III. 0 seconds or more. check "FR LH SENSO -III. eed to "10 msec". mal wheel sensors and <u>MPH) between the wh</u> | connector. R", "FR RH SENSO d error-detecting whe | R", "RR LH SENSOR" eel sensor. by the error detecting |
| YES >> GO TO 1 NO >> Repair or 5.CHECK DATA N Connect ABS act Connect wheel se Erase Self-diagn Turn the ignition Stat the engine. Select "ABS" and and "RR RH SEN NOTE: Set the "DATA M Read a value (wh egarding the defere heel sensor and the | r replace error-detected IONITOR (4) tuator and electric unit ensor harness connect osis result for "ABS" wi switch OFF, and wait 1 d "DATA MONITOR", of ISOR" with CONSULT- ONITOR" recording sp neel speed) of both nor <u>ance at 30 km/h (19 Norther brok</u> | d parts and GO TO 15. (control unit) harness of for. Ith CONSULT-III. 0 seconds or more. check "FR LH SENSO -III. eed to "10 msec". mal wheel sensors and <u>MPH) between the wh</u> wheel speed detected | connector. R", "FR RH SENSO d error-detecting whe leel speed detected by the normal whee | R", "RR LH SENSOR" eel sensor. by the error detecting I sensors, is the differ- |
| YES >> GO TO 1 NO >> Repair or 5. CHECK DATA N . Connect ABS act . Connect wheel s . Erase Self-diagn . Turn the ignition : . Stat the engine. . Select "ABS" and and "RR RH SEN NOTE: Set the "DATA M . Read a value (wh egarding the defere heel sensor and the nce within 5%, resp | r replace error-detected IONITOR (4) tuator and electric unit ensor harness connect osis result for "ABS" wi switch OFF, and wait 1 d "DATA MONITOR", of ISOR" with CONSULT- ONITOR" recording sp neel speed) of both nor <u>ence at 30 km/h (19 N</u> <u>actively?</u> | d parts and GO TO 15. (control unit) harness of for. th CONSULT-III. 0 seconds or more. check "FR LH SENSO -III. eed to "10 msec". mal wheel sensors and <u>MPH) between the wh</u> wheel speed detected | connector. R", "FR RH SENSO d error-detecting whe leel speed detected by the normal whee | R", "RR LH SENSOR" eel sensor. by the error detecting I sensors, is the differ- |
| YES >> GO TO 1 NO >> Repair of 5. CHECK DATA N . Connect ABS act . Connect wheel so . Erase Self-diagn . Turn the ignition f . Stat the engine. . Select "ABS" and and "RR RH SEN NOTE: Set the "DATA M . Read a value (wh <u>egarding the defere</u> <u>heel sensor and the</u> <u>nce within 5%, resp</u> YES >> GO TO 1 | r replace error-detected MONITOR (4) tuator and electric unit ensor harness connect osis result for "ABS" wi switch OFF, and wait 1 d "DATA MONITOR", c ISOR" with CONSULT- ONITOR" recording sp neel speed) of both nor <u>>nce at 30 km/h (19 N</u> <u>> maximum/minimum v</u> <u>>ctively?</u> 6. 7 | d parts and GO TO 15. (control unit) harness of for. Ith CONSULT-III. 0 seconds or more. check "FR LH SENSO -III. eed to "10 msec". mal wheel sensors and <u>MPH) between the wh</u> wheel speed detected | connector. R", "FR RH SENSO d error-detecting whe leel speed detected by the normal whee | R", "RR LH SENSOR" eel sensor. by the error detecting I sensors, is the differ- |
| YES >> GO TO 1 NO >> Repair or 5. CHECK DATA N . Connect ABS act . Connect wheel so . Erase Self-diagn . Turn the ignition . Stat the engine. . Select "ABS" and and "RR RH SEN NOTE: Set the "DATA M . Read a value (wh egarding the defered theel sensor and the nce within 5%, respond YES >> GO TO 1 NO >> GO TO 1 | r replace error-detected IONITOR (4) tuator and electric unit ensor harness connect osis result for "ABS" wi switch OFF, and wait 1 d "DATA MONITOR", of ISOR" with CONSULT ONITOR" recording sp neel speed) of both nor <u>ence at 30 km/h (19 N</u>) <u>a maximum/minimum v</u> <u>octively?</u> 6. 7. E DIACNOSIS (5) | d parts and GO TO 15. (control unit) harness of for. (th CONSULT-III. 0 seconds or more. check "FR LH SENSO -III. eed to "10 msec". (mal wheel sensors and <u>MPH) between the wh</u> wheel speed detected | connector. R", "FR RH SENSO d error-detecting whe <u>leel speed detected</u> by the normal whee | R", "RR LH SENSOR' eel sensor. by the error detecting I sensors, is the differ- |

- 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

- 1. Replace wheel sensor.
- Front: Refer to <u>BRC-116. "FRONT WHEEL SENSOR : Exploded View"</u>.
- Rear: Refer to <u>BRC-117, "REAR WHEEL SENSOR : Exploded View"</u>.
- 2. Erase Self-diagnosis result for "ABS" with CONSULT-III.
- 3. Turn the ignition switch OFF, and wait 10 seconds or more.
- 4. Stat the engine.
- 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-118, "FRONT SENSOR ROTOR : Exploded View".
- Rear: Refer to <u>BRC-118</u>, "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. Stat 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 <u>BRC-119, "Exploded View"</u>.
- NO >> INSPECTION END

Special Repair Requirement

INFOID:000000006347702

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"</u>.

>> END

< DTC/CIRCUIT DIAGNOSIS >

C1116 STOP LAMP SWITCH

Description

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

DTC Logic

INFOID:000000006347704

INFOID:000000006347703

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С

DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause | D |
|--------------------------------|--|---|---|--------|
| C1116 | STOP LAMP SW | When a stop lamp switch signal is not input where the brake pedal is depressed. | Harness or connector Stop lamp switch ABS actuator and electric unit (control unit) | E |
| DTC CO | NFIRMATION PROCE | DURE | | |
| 1. DTC F | REPRODUCTION PROCE | EDURE | | BRC |
| 1. Turn 2. Perfo | the ignition switch ON. orm self-diagnosis for "AB | S" with CONSULT-III. | | G |
| <u>ls DTC "(</u> | C1116" detected? | | | 9 |
| YES NO | >> Proceed to diagnosis p >> INSPECTION END | procedure. Refer to <u>BRC-55, "Diagnosis Procec</u> | lure". | н |
| Diagno | sis Procedure | | INFOID:00000006347705 | |
| NOTE: DTC "C1" for 1 min | 116" may be detected whe ute or more while driving t | en the brake pedal and the accelerator pedal ar he vehicle. This is not a malfunction. | e simultaneously depressed | I |
| 1. INTEF | RVIEW FROM THE CUST | OMER | | J |
| Check if driving th | the brake pedal and the a e vehicle. | accelerator pedal are simultaneously depressed | d for 1 minute or more while | |
| Is there s | such a history? | | | Κ |
| YES | >> GO TO 2. | | | |
| | >> GO 10 3. | | | I |
| | ORM SELF-DIAGNOSIS | <i></i> | | |
| 1. Eras 2 Turn | e Self-diagnosis result for the ignition switch OFF a | "ABS" with CONSULT-III. ind wait 10 seconds or more | | |
| 3. Start | the engine. | | | M |
| CAU Neve | TION: ar start the vehicle | | | |
| 4. Depr | ess the brake pedal seve | ral times. | | Ν |
| 5. Perfo | orm self-diagnosis for "AB | S" with CONSULT-III. | | |
| Is DTC "(| C1116" detected? | | | \sim |
| YES NO | >> GO TO 3. >> INSPECTION END | | | 0 |
| 3.STOP | LAMP FOR ILLUMINATIO | ON | | |
| Depress | brake pedal and check the | at stop lamp turns ON. | | Ρ |
| Does sto | <u>p lamp turn ON?</u> | | | |
| YES | >> GO TO 5. | | | |
| NÜ | Scheck stop lamp system <u>"Wiring Diagram - BCN</u> | em. Refer to <u>EXL-156, "Wiring Diagram - BCM -</u> <u>// -"</u> (HALOGEN TYPE). GO TO 4. | <u>"</u> (XENON TYPE), <u>EXL-340,</u> | |
| 4. CHEC | 4. CHECK DATA MONITOR (1) | | | |

< DTC/CIRCUIT 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.
- 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 <u>BRC-94, "Reference Value</u>".
- 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 <u>BRC-94, "Reference Value"</u>.

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 <u>BR-7, "Inspection and Adjustment"</u>.
- Is the inspection result normal?

YES >> GO TO 7.

NO >> Adjust stop lamp switch clearance. 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.

- 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 <u>BRC-94, "Reference Value"</u>.
- 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 <u>BRC-94, "Reference Value"</u>.

Is the inspection result normal?

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

/.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to BRC-58, "Component Inspection".

Is the inspection result normal?

- YES >> GO TO 9.
- NO >> Replace stop lamp switch. 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 <u>BRC-94</u>, "<u>Reference Value</u>".
- 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 <u>BRC-94, "Reference Value"</u>.

Is the inspection result normal?

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

1. Turn the ignition switch OFF.

| < DTC/CIRCUIT | DIAGNOSIS > | | | [VDC/TCS/ABS] | |
|---|---|--|---|--|--|
| Disconnect Check ABS Check ABS Check ABS | ABS actuator and ele actuator and electric actuator and electric ctor. | ectric unit (control unit (control unit) unit (control unit) | unit) harness connector. harness connector for disconr pin terminals for damage or lo | nection or looseness. Nose connection with har- | |
| Disconnect Check stop Check stop | Disconnect stop lamp switch harness connector. Check stop lamp switch harness connector for disconnection or looseness. Check stop lamp switch pin terminals for damage or loose connection with harness connector. | | | | |
| Is the inspection | result normal? | | | | |
| YES >> GO | TO 11. | | | | |
| NO >> Rep | air or replace error-c | letected parts. GC |) TO 10. | | |
| 10.CHECK DA | TA MONITOR (4) | | | | |
| 1. Connect AB | S actuator and elect | ric unit (control un | it) harness connector. | | |
| 2. Connect sto | p lamp switch harne | ss connector. | | | |
| 3. Erase Self-C | liagnosis result for "A | ABS" WITH COINSU | or more | | |
| 5. Start the end | aine. | | or more. | | |
| CAUTION: | | | | | |
| Never start | the vehicle. | | | | |
| 6. Select "ABS | ", "DATA MONITOR" poitor displays "On" o | and "STOP LAM | P SW [#] according to this order v | Nith CONSULI-III. Check | |
| ence Value" | | | | | |
| 7. Select "ABS displays "5 k | ", "DATA MONITOR par" or less when bra | " and "pressure se ike pedal is depre | ensor" according to this order. ss. Refer to <u>BRC-94, "Referen</u> | Check that data monitor ce Value". | |
| Is the inspection | result normal? | | | | |
| YES >> INS | PECTION END | | | | |
| NO >> GO | TO 11. | | | | |
| 11.CHECK ST | OP LAMP SWITCH | CIRCUIT (1) | | | |
| 1. Turn the ian | ition switch OFF. | | | | |
| Disconnect 2. Check voltage | ABS actuator and ele ge between ABS act | ectric unit (control uator and electric | unit) harness connector. unit (control unit) harness con | nector and ground. | |
| ABS actuator and | electric unit (control unit) | | Condition | Voltogo | |
| Connector | Terminal | | Condition | voltage | |
| | 20 | Cround | Brake pedal depressed | Battery voltage | |
| E41 | 30 | Ground | Brake pedal not depressed | Approx. 0 V | |
| Turn the ign Check voltage | ition switch ON. ge between ABS act | uator and electric | unit (control unit) harness con | nector and ground. | |
| ABS actuator and e | electric unit (control unit) | | Condition | Voltage | |
| Connector | Terminal | _ | Condition | voliage | |
| E 41 | 20 | Cround | Brake pedal depressed | Battery voltage | |
| E41 | | Ground | Brake pedal not depressed | Approx. 0 V | |
| Is the inspection YES >> Rep NO >> Rep 12. CHECK ST | result normal? lace ABS actuator a air or replace error-c OP LAMP SWITCH ition switch OFF. | nd electric unit (cc letected parts. GC CIRCUIT (2) | ontrol unit). Refer to <u>BRC-119,</u>) TO 12. | "Exploded View". | |
| Disconnect Check conti switch harne | stop lamp switch har nuity between ABS a ess connector. | ness connector. actuator and elect | tric unit (control unit) harness | connector and stop lamp | |

< DTC/CIRCUIT DIAGNOSIS >

| ABS actuator and ele | ctric unit (control unit) | Stop lamp switch | | Continuity | |
|----------------------|---------------------------|------------------|----------|------------|--|
| Connector | Terminal | Connector | Terminal | Continuity | |
| E/1 | 30 | 30 E110 | 2*1 | Existed | |
| | 30 | LIIO | 4*2 | Existed | |

*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 ele | ectric unit (control unit) | | Continuity |
|----------------------|----------------------------|--------|-------------|
| Connector Terminal | | | Continuity |
| E41 | 30 | Ground | Not existed |

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-119, "Exploded View"</u>.
- 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.

- 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 <u>BRC-94, "Reference Value"</u>.
- 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 <u>BRC-94, "Reference Value"</u>.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-119, "Exploded View"</u>.

Component Inspection

INFOID:000000006347706

1.CHECK STOP LAMP SWITCH

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

| Stop lamp switch | Condition | Continuity |
|------------------|--|-------------|
| Terminal | Condition | |
| 1 2 | Release stop lamp switch (When brake pedal is depressed.) | Existed |
| 1 – 2 | Push stop lamp switch (When brake pedal is released.) | Not existed |

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to <u>BR-18, "Exploded View"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Revision: 2011 October

BRC-58

2011 EX

INFOID:000000006347707

< DTC/CIRCUIT DIAGNOSIS >

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"</u>.

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< DTC/CIRCUIT DIAGNOSIS >

C1120, C1122, C1124, C1126 IN ABS SOL

Description

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:000000006347709

INFOID:00000006347710

INFOID:00000006347708

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. | |
| C1122 | FR RH IN ABS SOL | When the control unit detects a malfunction in the front RH inlet solenoid circuit. | ABS actuator and electric unit |
| C1124 | RR LH IN ABS SOL | When the control unit detects a malfunction in the rear LH inlet solenoid circuit. | (control unit) |
| 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 <u>BRC-60, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

2. Disconnect ABS actuator and electric unit (control unit) connector.

3. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

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

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

| ABS actuator and ele | ectric unit (control unit) | | Voltage | |
|----------------------|----------------------------|--------|-----------------|--|
| Connector | Connector Terminal | | vollage | |
| E41 | 3 | Ground | Battery voltage | |

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

 ${f 3}.$ CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY GROUND CIRCUIT

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

C1120, C1122, C1124, C1126 IN ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

| ABS actuator and ele | ectric unit (control unit) | | Continuity | |
|----------------------|----------------------------|--------|------------|--|
| Connector | Terminal | | Continuity | |
| E41 | 1 | Ground | Existed | |
| | 4 | Cround | LAISted | |

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:000000006347711

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Description".

>> END

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C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

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:000000006347713

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. | |
| C1123 | FR RH OUT ABS SOL | When the control unit detects a malfunction in the front RH outlet solenoid circuit. | ABS actuator and electric unit |
| C1125 | RR LH OUT ABS SOL | When the control unit detects a malfunction in the rear LH outlet solenoid circuit. | (control unit) |
| 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 <u>BRC-62, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

2. Disconnect ABS actuator and electric unit (control unit) connector.

3. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

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

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

| ABS actuator and ele | ectric unit (control unit) | | Voltage | |
|----------------------|----------------------------|--------|-----------------|--|
| Connector | Connector Terminal | | vollage | |
| E41 | 3 | Ground | Battery voltage | |

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

 ${f 3}.$ CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY GROUND CIRCUIT

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

INFOID:000000006347714

INFOID:000000006347712

[VDC/TCS/ABS]

C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

| ABS actuator and ele | ectric unit (control unit) | | Continuity | |
|----------------------|----------------------------|--------|------------|--|
| Connector Terminal | | | Continuity | |
| F41 | 1 | Ground | Existed | |
| 241 | 4 | Cround | LAISted | |

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:000000006347715

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEU-</u> <u>TRAL POSITION : Description"</u>.

>> END

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< DTC/CIRCUIT DIAGNOSIS >

C1130 ENGINE SIGNAL

Description

INFOID:000000006347716

[VDC/TCS/ABS]

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

DTC Logic

INFOID:000000006347717

INFOID:000000006347718

DTC DETECTION LOGIC

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

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" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-64, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

1.ECM SELF-DIAGNOSIS

Perform self-diagnosis for "ENGINE" with CONSULT-III.

Is any item indicated on the self-diagnosis display?

YES >> Check the malfunctioning system.

| NO | >> GO | TO 2. |
|----|-------|-------|
|----|-------|-------|

2. 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 any item indicated on the self-diagnosis display?

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

Special Repair Requirement

INFOID:000000006347719

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, <u>"ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"</u>.

>> END

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

C1140 ACTUATOR RELAY SYSTEM

Description

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

DTC Logic

INFOID:000000006347696

INFOID:000000006347695

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DTC DETECTION LOGIC

| DTC | Disp | olay item | Malfunc | tion detected condition | Possible cause |
|----------------|-----------------|-------------------------|--|---|---------------------------|
| C1140 | ACTUATOR RELAY | RELAY | During the actuator re actuator relay turns C relay is shorted to the | Harness or connector ABS actuator and electric unit | |
| 01140 | | | During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open. | | |
| DTC CC | NFIRMAT | ION PROCED | URE | | |
| 1. отс и | REPRODUC | CTION PROCED | DURE | | |
| 1. Turn | the ignition | switch ON. | | | |
| Is DTC " | C1140" dete | yriusis iur Abo | | -111. | |
| YES | >> Proceed | l to diagnosis pr | ocedure. Refer to | BRC-65, "Diagnosis Proc | cedure". |
| NO | >> INSPEC | TION ĔND | | | |
| Diagno | sis Proce | edure | | | INFOID:00000006347697 |
| 1.снес | | CTOR | | | |
| 1. Turn | the ignition | switch OFF. | | | |
| 2. Disc | onnect ABS | actuator and el | ectric unit (contro | ol unit) connector. | |
| Is the ins | spection resi | ult normal? | disconnection, ic | 03611633, 610. | |
| YES | >> GO TO 2 | 2. | | | |
| NO | >> Repair o | or replace error-o | detected parts. | | |
| Z.CHEC | CK SOLENC | DID, VDC SWIT | CH-OVER VALVE | AND ACTUATOR RELAY | Y POWER SUPPLY CIRCUIT |
| Check th | e voltage be | etween ABS act | uator and electric | c unit (control unit) harness | s connector and ground. |
| ABS act | tuator and elec | tric unit (control unit | •) | | |
| Cor | nector | Terminal | — — | Voltage | |
| | E41 | 3 | Ground | Battery voltage | |
| Is the ins | spection res | ult normal? | I | | |
| YES NO | >> GO TO 3 | 3. or replace error- | detected parts. | | |
| 3. CHEC | CK SOLENC | DID, VDC SWIT | CH-OVER VALVE | AND ACTUATOR RELAY | GROUND CIRCUIT |
| Check th | e continuity | between ABS a | actuator and elect | tric unit (control unit) harne | ess connector and ground. |
| | | | | . , | - |
| ABS act | uator and elec | tric unit (control unit | t) | | |

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

BRC-65

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

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:000000006347698

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION</u>: Description".

>> END

< DTC/CIRCUIT DIAGNOSIS >

C1142 PRESS SENSOR

Description

INFOID:000000006347720

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| The pres and elec unit).] | sure sensor converts the t tric unit (control unit). [The | prake fluid pressure to an electric signal and transported in the ABS actuated in the | nsmits it to the ABS actuator Bator and electric unit (control |
|--|---|---|---|
| DTC L | ogic | | INFOID:00000006347721 |
| DTC DE | TECTION LOGIC | | D |
| DTC | Display item | Malfunction detected condition | Possible cause |
| C1142 | PRESS SEN CIRCUIT | Pressure sensor signal line is open or shorted, or pres- sure sensor is malfunctioning. | Harness or connector Stop lamp switch ABS actuator and electric unit (control unit) |
| отс со 1. отс | ONFIRMATION PROCEI REPRODUCTION PROCE | DURE EDURE | BRC |
| 1. Turn 2. Perf Is DTC " YES | the ignition switch ON. orm self-diagnosis for "AB <u>C1142" detected?</u> >> Proceed to diagnosis p | S" with CONSULT-III. procedure. Refer to <u>BRC-67, "Diagnosis Procec</u> | G lure". H |
| Diagno | sis Procedure | | INFOID:00000006347722 |
| 1. CHEC | CK STOP LAMP SWITCH | | I |
| Check st | op lamp switch system. R | efer to BRC-55, "Diagnosis Procedure". | |
| Is the ins | spection result normal? >> GO TO 2. | | J |
| NO 2.снес | >> Repair or replace malf CK BRAKE SYSTEM | unction component. | K |
| 1. Che 2. Che 3. Che 4. Che | ck brake fluid leakage: Re ck front brake piping: Refe ck rear brake piping: Refe ck brake pedal: Refer to <u>B</u> ck master cylinder: Refer t | fer to <u>BR-10, "Inspection"</u> . r to <u>BR-22, "FRONT : Inspection"</u> . r to <u>BR-24, "REAR : Inspection"</u> . <u>R-19, "Inspection and Adjustment"</u> . | L |
| Che Che Che Che Che Che | ck fraster cylinder: Refer to ck brake booster: Refer to ck front disc brake: Refer to ck rear disc brake: Refer to | BR-30, "Inspection and Adjustment" BR-30, "Inspection and Adjustment" BR-39, "BRAKE CALIPER ASSEMBLY : Insp BR-45, "BRAKE CALIPER ASSEMBLY : Insp | M ection". |
| Is the ins | spection result normal? | | Ν |
| NO | >> Repair or replace error | r-detected parts. | |
| 3.ABS | ACTUATOR AND ELECTR | RIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS | S 0 |
| Perform | self-diagnosis for "ABS" w | ith CONSULT-III. | |
| <u>Is any ite</u> YES NO | em indicated on the self-dia >> Replace ABS actuator >> Check ABS actuator a with harness connecto | agnosis display? and electric unit (control unit). nd electric unit (control unit) pin terminals for c r. If any items are damaged, repair or replace e | P lamage or loose connection prror-detected parts. |
| Specia | l Repair Requiremer | ht | INFOID:00000006347723 |
| 4 | | | |

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

BRC-67

C1142 PRESS SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Description".

>> END

< DTC/CIRCUIT DIAGNOSIS >

C1143 STEERING ANGLE SENSOR

Description

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:000000006347725

INFOID:000000006347724

DTC DETECTION LOGIC

| DTC | Display item | Malfund | ction detected condition | | Possible cause | D |
|--|---|--|---------------------------------------|---------------|--|-----|
| C1143 | ST ANG SEN CIRCUIT | Steering angle sense | or is malfunctioning. | | Harness or connector Steering angle sensor ABS actuator and electric unit (control unit) | |
| DTC CC | NFIRMATION PROCE | DURE | | | | |
| 1.DTC | REPRODUCTION PROC | EDURE | | | | BRC |
| 1. Turn 2. Perfe Is DTC "(| the ignition switch ON. orm self-diagnosis for "AE C1143" detected? | S" with CONSULT | -111. | | | G |
| YES NO | >> Proceed to diagnosis >> INSPECTION END | procedure. Refer t | o <u>BRC-69, "Diagno</u> : | sis Procedu | <u>Ire"</u> . | Н |
| Diagno | sis Procedure | | | | INF0ID:00000006347726 | |
| 1. CHEC | CK CONNECTOR | | | | | I |
| Turn Disc Disc Disc Chee the inst | the ignition switch OFF. onnect ABS actuator and onnect steering angle ser ck terminal for deformatio spection result normal? | electric unit (contr nsor connector. n, disconnection, l | ol unit) connector. ooseness, etc. | | | J |
| YES NO | >> GO TO 2. >> Repair or replace erro | r-detected parts. | | | | Κ |
| 2.0HEC | ck the voltage between st | eering angle sense | or harness connecto | or and grou | nd | L |
| | sk the vehage settleen of | | | or and grou | | |
| | Steering angle sensor | | Condition | Voltage | | M |
| Cor | nector Terminal | | Contailion | ronago | | |
| N | M37 8 | Ground | Ignition switch: OFF | Approx. 0 | V | NI |
| Turn CAU Neve Chee | the ignition switch ON. ITION: er start the engine. ck the voltage between st | eering angle sense | or harness connecto | or and grou | nd. | 0 |
| | Steering angle sensor | | Condition | | | |
| Cor | nnector Terminal | | Condition | voitage | | Ρ |
| Ν | M37 8 | Ground | Ignition switch: ON | Battery volta | age | |
| Is the ins | pection result normal? | | | | | |
| YES NO | >> GO TO 4. >> GO TO 3. | | | | | |

 $\mathbf{3}.$ Check steering angle sensor power supply circuit

BRC-69

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C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch OFF.

- 2. Check 10 A fusible link (45).
- Disconnect IPDM E/R harness connector.

4. Check continuity between steering angle sensor harness connector and IPDM E/R harness connector.

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

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to <u>PG-71, "Wiring Diagram -</u> <u>IGNITION POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

4.CHECK STEERING ANGLE SENSOR GROUND

Check continuity between steering angle sensor harness connector and ground.

| Steering a | ngle sensor | | Continuity | |
|------------|-------------|--------|------------|--|
| Connector | Terminal | | | |
| M37 | 7 | Ground | Existed | |

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK DATA LINE

Check "STRG BRANCH LINE CIRCUIT". Refer to LAN-63, "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:000000006347727

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the steering angle sensor or the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEER-ING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Logic

INFOID:00000006347728

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[VDC/TCS/ABS]

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 Steering angle sensor ABS actuator and electric unit (control unit) |
| DTC CC | NFIRMATION PROCE | DURE | |
| 1. DTC | REPRODUCTION PROCE | EDURE | |
| 1. Turn 2. Sele and 3. Perfe <u>Is DTC "</u> YES | the ignition switch ON. ct "ABS", "WORK SUPPC perform adjust the neutral orm self-diagnosis for "AB <u>C1144" detected?</u> >> Proceed to diagnosis p | ORT" and "ST ANGLE SENSOR ADJUSTMENT' position of steering angle sensor. S" with CONSULT-III. procedure. Refer to <u>BRC-71, "Diagnosis Proced</u> | ' in order with CONSULT-III, |
| NO | >> INSPECTION END | | |
| Diagno | sis Procedure | | INFOID:00000006347729 |
| 1. CHEC | CK STEERING ANGLE SE | INSOR | |
| Check st <u>Is the ins</u> YES NO | eering angle sensor. Refe spection result normal? >> Replace ABS actuator | r to <u>BRC-69, "Diagnosis Procedure"</u> . and electric unit (control unit). | |
| Specia | I Repair Requiremer | nt | INFOID:00000006347730 |
| 1 | | ANCLE SENSOR NEUTRAL POSITION | |
| Always r | perform the neutral position | on adjustment for the steering angle sensor w | when replacing the steering |
| angle se | nsor or the ABS actuator a | and electric unit (control unit). Refer to <u>BRC-9, ",</u> <u>POSITION : Description"</u> . | ADJUSTMENT OF STEER- |
| | >> END | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

C1145, C1146 YAW RATE/SIDE G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

C1145, C1146 YAW RATE/SIDE G SENSOR

Description

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:000000006347732

INFOID:00000006347731

[VDC/TCS/ABS]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.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 <u>BRC-72, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006347733

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 warning 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.

1.CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect yaw rate/side G sensor connector.
- 4. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

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

2.CHECK YAW RATE/SIDE G SENSOR POWER SUPPLY

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

| Yaw rate/side G sensor | | | Condition | Voltago | |
|------------------------|----------|--------|----------------------|-------------|--|
| Connector | Terminal | | Condition | voltage | |
| M143 | 4 | Ground | Ignition switch: OFF | Approx. 0 V | |

2. Turn the ignition switch ON. CAUTION:

Never start the engine.

3. Check the voltage between yaw rate/side G sensor harness connector and ground.
C1145, C1146 YAW RATE/SIDE G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

| Yaw rate/side | e G sensor | | Condition | | |
|--|--|------------------------------|----------------------|------------------------------|------------------------------|
| Connector | Terminal | | Condition | voltage | |
| M143 | 4 | Ground | Ignition switch: ON | Battery voltage | |
| the inspection re | esult normal? | | · | | |
| YES >> GO TO | O 4. | | | | |
| NO >> GO TO | J 3. | | | | |
| CHECK YAW F | RATE/SIDE G SEN | SOR POWER | SUPPLY CIRCUI | Г | |
| Turn the ignition Check 10 A fu Disconnect IP Check the cor | on switch OFF. Isible link (45). DM E/R harness c Itinuity between AE | onnector. 3S actuator and | d electric unit (con | trol unit) harness co | nnector and IPDM E/ |
| R harness cor | nnector. | | | | |
| Yaw rate/si | de G sensor | | IPDM E/R | | - |
| Connector | Terminal | Connector | Terminal | Continuity | |
| M143 | 4 | E5 | 25 | Existed | _ |
| the inspection re | esult normal? | 1 | 1 | | — |
| ES >> Perfor | m the trouble diag | nosis for ignitio | on power supply c | ircuit. Refer to <u>PG-7</u> | <u>71, "Wiring Diagram -</u> |
| O >> Repai | r or replace error-c | letected parts. | | | |
| CHECK YAW F | RATE/SIDE G SEN | SOR GROUNI | C | | |
| eck the continu | itv between vaw ra | te/side G sens | or harness conne | ctor and ground. | |
| | ity between yaw la | | | otor and ground. | |
| Yaw rate/s | side G sensor | | | | |
| Connector | Terminal | | Continuity | | |
| M143 | 1 | Ground | Existed | | |
| he inspection re | esult normal? | 1 | | | |
| ES >> GO T | O 5. | | | | |
| O >> Repai | r or replace error-c | letected parts. | | | |
| CHECK YAW F | RATE/SIDE G SEN | SOR HARNES | S | | |
| eck the continu | ity between yaw ra | ate/side G sen | sor harness conn | ector and ABS actu | ator and electric unit |
| ontrol unit) harne | ess connector. | | | | |
| ABS actuator an | d electric unit (control u | unit) | Vaw rate/side G | sensor | |
| | | (| | Terminal | Continuity |
| Connector | 25 | | Sonnector | 2 | |
| E41 | 25 | | M143 | 2 | Existed |
| | 40 | | | 3 | |
| | <u>esuit normal?</u> | | | | |
| = 5 >> GO 10 0 >> Renai | J o. r or replace error-c | letected parts | Refer to BRC-114 | "Precautions for H | arness Renair" |
| | V PATE/SIDE G SE | | | | <u>amooo nopan</u> . |
| KEFLACE TAV | | | | | |
| Replace yaw | rate/side G sensor. | | | | |
| Turn the ioniti | on switch OFF. | | NGULI-III. | | |
| Turn the igniti | on switch ON. | | | | |
| CAUTION: | | | | | |
| Never start th | ne engine. liagnosis for "ABS" | | т ш | | |
| | aynosis for ABS | | .1-111. | | |
| DTC "C1145" or | ""C1146" detected | <u>?</u> | | | |

C1145, C1146 YAW RATE/SIDE G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

NO >> INSPECTION END

Special Repair Requirement

INFOID:000000006347734

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: Description".

>> END

C1147, C1148, C1149, C1150 USV/HSV LINE

< DTC/CIRCUIT DIAGNOSIS >

C1147, C1148, C1149, C1150 USV/HSV LINE

Description

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:000000006347736

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DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause | Е |
|--|--|---|------------------------|-----|
| 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. | | |
| 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. | Harness or connector | BRC |
| 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. | (control unit) | G |
| 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. | | Η |
| DTC CONFIRMATION PROCEDURE 1.DTC REPRODUCTION PROCEDURE | | | | |
| 1. Turn 2. Perfo | the ignition switch ON. form self-diagnosis for "AB | S" with CONSULT-III. | | J |
| <u>Is DTC "(</u> | <u>C1147", "C1148", "C1149"</u> | or "C1150" detected? | | |
| YES >> Proceed to diagnosis procedure. Refer to <u>BRC-75, "Diagnosis Procedure"</u> . K NO >> INSPECTION END | | | | |
| Diagno | sis Procedure | | INFOID:000000006347737 | L |

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

2. Disconnect ABS actuator and electric unit (control unit) connector.

3. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

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

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

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

C1147, C1148, C1149, C1150 USV/HSV LINE

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

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

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

| ABS actuator and ele | ectric unit (control unit) | | Continuity | |
|----------------------|----------------------------|--------|------------|--|
| Connector | nnector Terminal | | Continuity | |
| E41 | 1 | Ground | Evisted | |
| | 4 | Ground | LAISted | |

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION : Description".

>> END

C1154 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

C1154 TRANSMISSION RANGE SWITCH

Description

The ABS actuator and electric unit (control unit) and TCM exchange signals via the CAN communication line. DTC Logic

DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause | |
|-------------------|---|---|--|-----|
| C1154 | PNP POSI SIG | TCM internal malfunction or ABS actuator and electric unit (control unit) internal malfunction. | Harness or connector ABS actuator and electric unit (control unit) TCM | D |
| DTC CC | ONFIRMATION PROCE | DURE | | |
| 1. DTC | REPRODUCTION PROCI | EDURE | | BRO |
| 1. Turn | the ignition switch ON. | | | |
| | OTTI Sell-Glagnosis IOF AB | S with CONSULT-III. | | |
| YES | Sector 2 - Sector 2 | procedure Refer to BRC-77 "Diagnosis Proced | dure" | G |
| NO | >> INSPECTION END | | | |
| Diagno | sis Procedure | | INFOID:00000006347741 | Н |
| 1 our | | | | |
| | | | | I |
| 1. Turn 2 Disc | the ignition switch OFF. | electric unit (control unit) connector | | |
| 3. Che | ck terminal for deformation | n, disconnection, looseness, etc. | | |
| Is the ins | spection result normal? | | | J |
| YES | >> GO TO 2. | | | |
| NO | >> Replace or repair dam | aged parts. | | k |
| 2.CHEC | CK TCM | | | TX. |
| Perform | self-diagnosis for "TRANS | MISSION" with CONSULT-III. | | |
| Is the ins | spection result normal? | | | L |
| YES | >> GO TO 3. | · · · · · | | |
| | >> Repair or replace erro | r-detected parts. | | |
| 3. CHEC | CK ABS ACTUATOR AND | ELECTRIC UNIT (CONTROL UNIT) | | M |
| Perform | self-diagnosis for "ABS" w | rith CONSULT-III. | | |
| Is the ins | spection result normal? | | | Ν |
| YES | >> INSPECTION END | | | |
| NO | >> Repair or replace erro | r-detected parts. | | |
| Specia | I Repair Requiremer | nt | INFOID:00000006347742 | 0 |
| 1.ADJU | ISTMENT OF STEERING | ANGLE SENSOR NEUTRAL POSITION | | |
| Always p | perform the neutral positio | n adjustment for the steering angle sensor, wh | en replacing the ABS actua- | Ρ |

TRAL POSITION : Description".

>> END

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< DTC/CIRCUIT DIAGNOSIS >

C1155 BRAKE FLUID LEVEL SWITCH

Description

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:000000006347744

INFOID:000000006347743

DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|--|--|---|--|
| C1155 | BR FLUID LEVEL LOW | Brake fluid level is low or communication line between the ABS actuator and electric unit (control unit) and brake fluid level switch is open or shorted. | Harness or connector Brake fluid level switch Unified meter and A/C amp. |
| DTC CO | NFIRMATION PROCEI | DURE | |
| 1. DTC F | REPRODUCTION PROCE | EDURE | |
| 1. Turn 2. Perfo Is DTC "0 | the ignition switch ON. orm self-diagnosis for "AB C1155" detected? | S" with CONSULT-III. | |
| YES NO | >> Proceed to diagnosis p >> INSPECTION END | procedure. Refer to <u>BRC-78, "Diagnosis Proced</u> | <u>ure"</u> . |
| Diagno | sis Procedure | | INFOID:00000006347745 |
| 1. CHEC | K BRAKE FLUID LEVEL | | |
| 1. Turn 2. Chec | the ignition switch OFF. k brake fluid level. Refer | to <u>BR-10, "Inspection"</u> . | |
| Is the ins | pection result normal? | | |
| YES NO | >> GO TO 2. >> Refill brake fluid. Refe | to BR-10, "Refilling". | |
| 2.PERF | ORM SELF-DIAGNOSIS | (1) | |
| 1. Eraso 2. Turn 3. Turn CAU | e Self-diagnosis result for the ignition switch OFF, a the ignition switch ON. TION: er start the engine | "ABS" with CONSULT-III. nd wait 10 seconds or more. | |
| 4. Perfc | orm self-diagnosis for "AB | S" with CONSULT-III. | |
| <u>Is DTC "(</u> | C1155" detected? | | |
| YES : | >> INSPECTION END | | |
| 3.CHEC | CK BRAKE FLUID LEVEL | SWITCH | |
| Check br | ake fluids level switch. Re | fer to BRC-80, "Component Inspection". | |
| <u>Is the ins</u> YES NO | <u>pection result normal?</u> >> GO TO 5. >> Replace reservoir tank | . Refer to <u>BR-25, "Exploded View"</u> . GO TO 4. | |
| 4.PERF | ORM SELF-DIAGNOSIS | (2) | |
| Erase Turn Turn CAU | e Self-diagnosis result for the ignition switch OFF, a the ignition switch ON. TION: | "ABS" with CONSULT-III. nd wait 10 seconds or more. | |

Never start the engine.

4. Perform self-diagnosis for "ABS" with CONSULT-III.

BRC-78

C1155 BRAKE FLUID LEVEL SWITCH

| < DTC/CIR | CUIT DIAG | NOSIS > | | | | [VDC/TCS/ABS] |
|--------------------------|----------------------------------|------------------|-----------------------|---------------|-------------------------|---------------------------|
| Is DTC "C1 | 155" detected | <u>4?</u> | | | | |
| YES >> | INSPECTIO | N END | | | | |
| NO >> | • GO TO 5. | | | | | |
| J. CHECK | CONNECTC | R AND TERN | /INAL | | | |
| 1. Turn th | e ignition swi | tch OFF. | | | | |
| 2. Disconi 3. Check | nect brake flu brake fluid le | and level switch | h harness o | connector. | onnection or looseness | |
| 4. Check | brake fluid le | vel switch pin | terminals f | or damage of | r loose connection with | , harness connector. |
| 5. Discon | nect combina | ition meter ha | rness conn | ector. | | |
| 6. Check | combination | meter harnes | s connector | r for disconn | ection or looseness. | |
| 7. Check | compination | ormal2 | ninais for da | amage of loc | bse connection with har | ness connector. |
| | | <u>ormar</u> | | | | |
| NO >> | Repair or re | place error-de | etected part | s. GO TO 6. | | |
| 6.PERFOR | RM SELE-DI | AGNOSIS (3) | · · · · · · · · · · · | | | |
| | | | | nootor | | |
| 2. Connec | ct combinatio | n meter harne | erness con | tor. | | В |
| 3. Erase S | Self-diagnosi | s result for "Al | BS" with CO | ONSULT-III. | | |
| 1. Turn th | e ignition swi | tch OFF, and | wait 10 sec | conds or mor | e. | |
| S. Turn th | e ignition swi | tch ON. | | | | |
| Never | start the eng | jine. | | | | |
| 6. Perforn | n self-diagno | sis for "ABS" v | with CONS | ULT-III. | | |
| <u>s DTC "C1</u> | 155" detected | <u>1?</u> | | | | |
| YES >> | | N END | | | | |
| NO >> | GO 107. | _ | _ | | | |
| I .CHECK | BRAKE FLU | ID LEVEL SW | /ITCH HAR | NESS | | |
| 1. Turn th | e ignition swi | tch OFF. | | | | |
| 2. Disconi 3. Disconi | nect brake flu | and level switch | h harness c | connector. | | |
| 4. Check | continuity be | tween brake f | luid level sv | vitch harness | s connector and combir | nation meter harness con- |
| nector. | - | | | | | |
| | | I | | | | |
| Brake fluid | d level switch | Combinati | on meter | Continuity | | |
| Connector | Terminal | Connector | Terminal | Continuity | | |
| E47 | 1 | M53 | 28 | Existed | | |
| . Check | continuity be | tween brake f | luid level sv | witch harnes | s connector and ground | J. |
| | | | | | | |
| | Brake fluid leve | switch | | | Continuity | |
| Conne | ector | Terminal | | _ | Continuity | |
| E4 | 7 | 2 | (| Ground | Not existed | |
| s the inspe | ction result n | ormal? | 1 | | · | |
| YES >> | GO TO 8. | | | | | |
| NO >> | Repair or re | place error-de | etected part | s. GO TO 8. | | |
| З. СНЕСК | BRAKE FLU | ID LEVEL SW | /ITCH GRC | DUND | | |
| Check cont | inuity betwee | n brake fluid | level switch | harness col | nnector and ground. | |
| | | | | | 0 | |
| | Brake fluid leve | switch | | | | |
| | | | | — | Continuity | |

ConnectorTerminalContinuityE472GroundExisted

Is the inspection result normal?

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 9.

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

9.CHECK COMBINATION METER

Check combination meter. Refer to MWI-42, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-119, "Exploded View"</u>.

NO >> Repair or replace combination meter. Refer to <u>MWI-133</u>, "Exploded View".

Component Inspection

1. CHECK BRAKE FLUID LEVEL SWITCH

1. Turn the ignition switch OFF.

2. Disconnect brake fluid level switch connector.

3. Check the continuity between brake fluid level switch connector terminals.

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace reservoir tank. Refer to <u>BR-25, "Exploded View"</u>.

Special Repair Requirement

INFOID:000000006347747

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION</u>: Description".

>> END

< DTC/CIRCUIT DIAGNOSIS >

C1185 ICC UNIT

Description

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

DTC Logic

INFOID:000000006347749

INFOID:000000006347748

DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause | D |
|---|---|--|---|-----|
| C1185 | ACC CONT | ICC sensor integrated unit internal malfunction. | Harness or connector ICC sensor integrated unit ABS actuator and electric unit (control unit) CAN communication line | Е |
| DTC CC | NFIRMATION PROCE | DURE | | BRC |
| 1.DTC | REPRODUCTION PROCE | EDURE | | |
| 1. Turn 2. Perfe <u>Is DTC "(</u> | the ignition switch ON. orm self-diagnosis for "AB C1185" detected? | S" with CONSULT-III. | | G |
| YES NO | >> Proceed to diagnosis >> INSPECTION END | procedure. Refer to <u>BRC-81, "Diagnosis Proced</u> | ure". | Н |
| Diagno | sis Procedure | | INFOID:00000006347750 | |
| 1.снес | CK ICC SENSOR INTEGR | ATED UNIT CIRCUIT | | |
| Perform | self-diagnosis for "ICC" wi | ith CONSULT-III. | | |
| Is any ite | em indicated on the self-di | agnosis display? | | J |
| YES NO | >> Repair or replace erro >> GO TO 2. | r-detected parts. | | |
| 2.снес | CK ABS ACTUATOR AND | ELECTRIC UNIT (CONTROL UNIT) | | Κ |
| Perform | self-diagnosis for "ABS" w | /ith CONSULT-III. | | |
| <u>Is any ite</u> | em indicated on the self-di | agnosis display? | | L |
| YES NO | >> Repair or replace erro >> INSPECTION END | r-detected parts. | | |
| Specia | l Repair Requiremer | nt | INFOID:00000006347751 | Μ |
| 1.adju | STMENT OF STEERING | ANGLE SENSOR NEUTRAL POSITION | | NI |
| Always p | perform the neutral positio | n adjustment for the steering angle sensor, whe | en replacing the ABS actua- | IN |
| TRAL PC | <u>DSITION : Description"</u> . | Noise to <u>bette of the best of</u> | CONTROLL GENOOR NEU- | 6 |
| | | | | 0 |
| | >> END | | | |

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< DTC/CIRCUIT DIAGNOSIS >

U1000, U1002 CAN COMM CIRCUIT

Description

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:000000006347753

DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause |
|-------|------------------|---|---|
| U1000 | CAN COMM CIRCUIT | When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more. | CAN communication line ABS actuator and electric unit |
| U1002 | SYSTEM COMM | When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2seconds or less. | (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" or "U1002" detected?
- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-82, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000006347754

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

Perform self-diagnosis for "ABS" with CONSULT-III.

Is DTC "U1000" or "U1002" detected?

YES >> Proceed to diagnosis procedure. Refer to LAN-16, "Trouble Diagnosis Flow Chart".

NO >> INSPECTION END

Special Repair Requirement

INFOID:000000006347755

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-9</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION</u>: Description".

>> END

U1100 CAN COMM CIRCUIT (ICC UNIT)

< DTC/CIRCUIT DIAGNOSIS >

U1100 CAN COMM CIRCUIT (ICC UNIT)

Description

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

DTC Logic

DTC DETECTION LOGIC

| DTC | Display item | Malfunction detected condition | Possible cause | D |
|---|---|--|--|-----|
| U1100 | ACC COMM CIRCUIT | When there is a malfunction in the CAN communication circuit or ICC sensor integrated unit. | CAN communication line ABS actuator and electric unit (control unit) ICC integrated unit | E |
| DTC CC | NFIRMATION PROCE | DURE | | |
| 1. DTC F | REPRODUCTION PROCE | EDURE | | BRC |
| 1. Turn 2. Perfo Is DTC "I | the ignition switch ON. orm self-diagnosis for "AB U1100" detected? | S" with CONSULT-III. | | G |
| NO | >> INSPECTION END | blocedule. Relet to <u>BRC-63. Diagnosis Proced</u> | uie | Н |
| Diagno | sis Procedure | | INFOID:00000006347758 | 11 |
| 1. CHEC | CK CAN COMMUNICATIC | N LINE | | |
| Check C | AN communication line. R | efer to BRC-82, "Diagnosis Procedure". | | |
| Is the ins | pection result normal? | | | J |
| YES | >> GO TO 2. | r-detected parts | | 0 |
| | CK ICC INTEGRATED UN | | | |
| Porform | solf diagnosis for "ICC" wi | | | K |
| Is the ins | section result normal? | | | |
| YES NO | >> ABS actuator and elec >> Repair or replace error | tric unit (control unit). r-detected parts. | | L |
| Special | l Repair Requiremer | nt | INFOID:00000006347759 | M |
| 1. ADJU | STMENT OF STEERING | ANGLE SENSOR NEUTRAL POSITION | | |
| Always p tor and e <u>TRAL PC</u> | perform the neutral positio electric unit (control unit). <u>DSITION : Description"</u> . | n adjustment for the steering angle sensor, whe Refer to <u>BRC-9, "ADJUSTMENT OF STEERIN</u> | en replacing the ABS actua- IG ANGLE SENSOR NEU- | Ν |

BRC-83

>> END

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Description

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

Diagnosis Procedure

INFOID:000000006347761

INFOID:00000006347760

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) | | | Condition | Voltago | |
|---|----------|--------|----------------------|-------------|--|
| Connector | Terminal | | Condition | voltage | |
| E41 | 28 | Ground | Ignition switch: OFF | 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) | | | Condition | Voltago |
|---|----------|--------|---------------------|-----------------|
| Connector | Terminal | | Condition | vollage |
| E41 | 28 | Ground | Ignition switch: ON | 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 10Ă fusible link (45).
- 3. Disconnect IPDM E/R harness connector.
- 4. Check continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/R harness connector.

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

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to <u>PG-71, "Wiring Diagram -</u> <u>IGNITION POWER SUPPLY -"</u>.

NO >> Repair or replace error-detected parts.

 ${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY

1. Turn the ignition switch OFF.

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

| ABS actuator and ele | ectric unit (control unit) | _ | Voltage |
|----------------------|----------------------------|------------------|-----------------|
| Connector | Terminal | | |
| E41 | 2 | Ground Battery v | |
| | 3 | Cround | Dattery voltage |

Is the inspection result normal?

YES >> GO TO 4.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

NO >> Perform the trouble diagnosis for power supply circuit.

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 | | Continuity |
| E41 | 1 | Ground | Existed |
| C41 | 4 | Ground | Existed |

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

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PARKING BRAKE SWITCH

Component Function Check

1.CHECK PARKING BRAKE SWITCH OPERATION

Operate the parking brake pedal. Then check that the brake warning lamp in the combination meter turns ON/ OFF correctly.

| Condition | Brake warning lamp illumination status |
|---|--|
| When the parking brake pedal is operation | ON |
| When the parking brake pedal is not oper- ation. | OFF |

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-86, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000006347763

1.CHECK PARKING BRAKE SWITCH

Check parking brake switch. Refer to BRC-86, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace parking brake switch.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-40, "Diagnosis Descrip-</u> tion".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace combination meter.

3.CHECK DATA MONITOR

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 switch is active | ON |
| Parking brake switch is inactive | OFF |

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check unified meter and A/C amp. Refer to MWI-42, "CONSULT-III Function (METER/M&A)".

Component Inspection

INFOID:000000006347764

1.CHECK PARKING BRAKE SWITCH

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

| Parking brake switch | | | Condition | |
|----------------------|---------------|--------|--|-------------|
| Connector | Terminal | | Condition | |
| E107 | -107 1 Cround | | When the parking brake switch is operated. | Existed |
| LIUI | I | Giouna | When the parking brake switch is not operated. | Not existed |

PARKING BRAKE SWITCH

| < DTC/CIRCUIT DIAGNOSIS > | [VDC/TCS/ABS] |
|--|---------------|
| Is the inspection result normal? | |
| YES >> INSPECTION END NO >> Replace parking brake switch. | A |
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VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

VDC OFF SWITCH

Description

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

Component Function Check

1.CHECK VDC OFF SWITCH OPERATION

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

| Condition | VDC OFF indicator lamp illumination status |
|--|--|
| 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? | |

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-88, "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to <u>BRC-89, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> VDC OFF switch is malfunctioning. Replace VDC OFF switch.

2.check vdc off switch harness

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

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

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

| ABS actuator and ele | ectric unit (control unit) | | Continuity |
|----------------------|----------------------------|--------|-------------|
| Connector | Terminal | | Continuity |
| E41 | 31 | Ground | Not existed |

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

| VDC OF | FF switch | | Continuity |
|-----------|-----------|--------|------------|
| Connector | Terminal | | Continuity |
| M19 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 3.

NO >> If the open or short in harness, repair or replace harness.

BRC-88

INFOID:000000006347765

INFOID:00000006347766

VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

| 3. CHECK CO | MBINATION METER | | | | Λ |
|---|--|--------------------------------------|----------------------------|------------------------|-----|
| Connect Al Connect VI Check the Description | BS actuator and electric unit (control DC OFF switch connector. indication and operation of combir ". | unit) connector. nation meter are | normal. Refer to <u>MV</u> | VI-40, "Diagnosis | В |
| Is the inspectio YES >> INS NO >> Re | <u>n result normal?</u> SPECTION END pair or replace combination meter. | | | | С |
| Component | Inspection | | | INFOID:000000006347768 | |
| 1.CHECK VD | C OFF SWITCH | | | | D |
| Turn the ig Disconnect Check the | nition switch OFF. t VDC OFF switch connector. continuity between VDC OFF switch o | connector termin | als. | | Е |
| VDC OFF switch | Condition | Continuity | | | BRC |
| Terminal | | Continuity | | | |
| 1 – 2 | When VDC OFF switch is hold pressed. | Existed | | | G |
| | When releasing VDC OFF switch. | Not existed | | | 0 |
| Is the inspectio YES >> INS NO >> Re | <u>n result normal?</u> SPECTION END place VDC OFF switch. | | | | Н |
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ABS WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

ABS WARNING LAMP

Description

INFOID:000000006347769

[VDC/TCS/ABS]

×: ON -: OFF

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

Component Function Check

INFOID:000000006347770

1.CHECK ABS WARNING LAMP OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-90, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000006347771

1.CHECK SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT-III.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-40</u>, "Diagnosis Description".

Is the inspection result normal?

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

BRAKE WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

BRAKE WARNING LAMP

Description

[VDC/TCS/ABS]

INFOID:000000006347772

А

| | ×: ON –: OFF B |
|--|---|
| Condition | Brake warning lamp (Note 1) |
| Ignition switch OFF | - |
| For 1 second after turning ignition switch ON | × (Note 2) |
| 1 second later after turning ignition switch ON | × (Note 2) |
| EBD function is malfunctioning. | × D |
| NOTE: 1: Brake warning lamp will turn on in case of parking brake oper (when brake fluid is insufficient). 2: After starting the engine, brake warning lamp is turned off. | eration (when switch is ON) or of brake fluid level switch operation ${\sf E}$ |
| Component Function Check | INFOID:00000006347773 |
| 1. BRAKE WARNING LAMP OPERATION CHECK 1 | |
| Check that the lamp illuminates for approximately 1 se Is the inspection result normal? YES >> GO TO 2. NO >> Proceed to diagnosis procedure. Refer to 2. BRAKE WARNING LAMP OPERATION CHECK 2 | cond after the ignition switch is turned ON. G BRC-91, "Diagnosis Procedure". H |
| Check that the brake warning lamp in the combination ing brake pedal. <u>Is the inspection result normal?</u> YES >> INSPECTION END NO >> Check parking brake switch. Refer to <u>BRC</u> | meter turns ON/OFF correctly when operating the park- |
| Diagnosis Procedure | INFOID:00000006347774 |
| 1. CHECK PARKING BRAKE SWITCH | K |
| Check that the brake warning lamp in the combination ing brake pedal. Is the inspection result normal? YES >> GO TO 2. NO >> Check parking brake switch. Refer to BRC 2.CHECK SELF-DIAGNOSIS | meter turns ON/OFF correctly when operating the park- |
| Perform self-diagnosis for "ABS" with CONSULT-III. | |
| <u>Is the inspection result normal?</u> YES >> GO TO 3. NO >> Check items displayed by self-diagnosis. 3. CHECK COMBINATION METER | N O |
| Check if the indication and operation of combination m tion". Is the inspection result normal? YES >> Replace ABS actuator and electric unit (co NO >> Repair or replace combination meter. | neter are normal. Refer to <u>MWI-40, "Diagnosis Descrip-</u> P |

< DTC/CIRCUIT DIAGNOSIS >

VDC OFF SWITCH

Description

INFOID:000000006347775

INFOID:00000006347776

[VDC/TCS/ABS]

×: ON -: OFF

| Condition | VDC OFF indicator lamp |
|--|------------------------|
| Ignition switch OFF | - |
| For 1 second after turning ignition switch ON | × |
| 1 second later after turning ignition switch ON | - |
| VDC OFF switch turned ON. (VDC function is OFF.) | × |

Component Function Check

1.VDC OFF INDICATOR LAMP OPERATION CHECK 1

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-92, "Diagnosis Procedure"</u>.

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 <u>BRC-88. "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000006347777

1.CHECK VDC OFF SWITCH

Perform the trouble diagnosis for VDC OFF switch. Refer to BRC-88. "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check VDC OFF switch. Refer to <u>BRC-88. "Diagnosis Procedure"</u>.

2. CHECK SELF-DIAGNOSIS

Perform self-diagnosis for "ABS" with CONSULT-III.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check items displayed by self-diagnosis.

 $\mathbf{3.}$ CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-40, "Diagnosis Descrip-</u> tion".

Is the inspection result normal?

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

VDC WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

VDC WARNING LAMP

Description

INFOID:000000006347778

| | ×: ON ∆: Blink –: OFF |
|---|---|
| Condition | VDC warning lamp |
| Ignition switch OFF | - |
| For 1 second after turning ignition switch ON | X |
| 1 second later after turning ignition switch ON | _ |
| VDC/TCS is activated while driving | Δ |
| VDC/TCS function is malfunctioning. | × |
| ABS function is malfunctioning. | × |
| EBD function is malfunctioning. | × |
| Component Function Check | INF0/D-00000006347779 |
| • | |
| CHECK VDC WARNING LAMP OPERATION | |
| Check that the lamp illuminates for approximately 1 sec | ond after the ignition switch is turned ON. |
| s the inspection result normal? | |
| YES >> INSPECTION END | |
| NO $>>$ Proceed to diagnosis procedure. Refer to <u>B</u> | <u>RC-93, "Diagnosis Procedure"</u> . |
| Diagnosis Procedure | INFOID:00000006347780 |
| 1.CHECK SELF-DIAGNOSIS | |
| Perform self-diagnosis for "ABS" with CONSULT-III. | |
| s the inspection result normal? | |
| YES >> GO TO 2. | |
| NO >> Check items displayed by self-diagnosis. | |
| 2. CHECK COMBINATION METER | |
| Check if the indication and operation of combination me | eter are normal. Refer to MWI-40, "Diagnosis Descrip- |
| is the inspection result normal? | |
| YES >> Replace ABS actuator and electric unit (con | trol unit). |
| NO >> Repair or replace combination meter. | |
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< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000006347781

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.

| | | Data monitor | |
|--------------------------|--|---|--|
| Monitor item | Display content | Condition | Reference value in normal operation |
| | | Vehicle stopped | 0 [km/h (MPH)] |
| FR LH SENSOR | Wheel speed | Vehicle running (Note 1) | Nearly matches the speedometer dis- play (± 10% or less) |
| | | Vehicle stopped | 0 [km/h (MPH)] |
| FR RH SENSOR | Wheel speed | Vehicle running (Note 1) | Nearly matches the speedometer display (± 10% or less) |
| | | Vehicle stopped | 0 [km/h (MPH)] |
| RR LH SENSOR | Wheel speed | Vehicle running (Note 1) | Nearly matches the speedometer dis- play (± 10% or less) |
| | | Vehicle stopped | 0 [km/h (MPH)] |
| RR RH SENSOR Wheel speed | Wheel speed | Vehicle running (Note 1) | Nearly matches the speedometer dis- play (± 10% or less) |
| | Step lenn switch signal status | When brake pedal is depressed | On |
| STOP LAIVIP SV | Stop lamp switch signal status | When brake pedal is not depressed | Off |
| BATTERY VOLT | Battery voltage supplied to the ABS ac- tuator and electric unit (control unit) | Ignition switch ON | 10 – 16 V |
| GEAR | Gear position determined by TCM | First gear (1GR) Second gear (2GR) Third gear (3GR) Forth gear (4GR) Fifth gear (5GR) | 1 2 3 4 5 |
| SLCT LVR POSI | A/T selector lever position | P position R position N position D position | P R N D |
| | | Vehicle stopped | Approx. 0 d/s |
| YAW RATE SEN | sensor | Vehicle turning right | Negative value |
| | | Vehicle turning left | Positive value |
| | Throttle actuator opening/closing is | Accelerator pedal not depressed (ignition switch is ON) | 0 % |
| | al) | Depress accelerator pedal (ignition switch is ON) | 0 - 100 % |
| | - | Vehicle stopped | Approx. 0 m/s ² |
| SIDE G-SENSOR | Transverse G detected by side G sensor | Vehicle turning right | Negative value |
| | | Vehicle turning left | Positive value |

< ECU DIAGNOSIS INFORMATION >

| | | Data monitor | | 0 |
|---|---|--|--|-----|
| Monitor item | Display content | Condition | Reference value in normal operation | A |
| | | Driving straight | ±2.5° | |
| STR ANGLE SIG | Steering angle detected by steering an- | Turn 90° to right | Approx. +90° | В |
| | gie sensor | Turn 90° to left | Approx. –90° | |
| | Brake fluid pressure detected by pres- | With ignition switch turned ON and brake pedal released | Approx. 0 bar | С |
| PRESS SENSOR | sure sensor | With ignition switch turned ON and brake pedal depressed | -40 to 300 bar | D |
| | | With engine stopped | 0 rpm | |
| ENGINE RPM | With engine running | Engine running | Almost in accor- dance with tachome- ter display | E |
| | Proke fluid lovel owitch signal status | When brake fluid level switch ON | On | |
| FLUID LEV SVV | Brake huid level switch signal status | When brake fluid level switch OFF | Off | BRC |
| | Desking broke switch singel status | Parking brake switch is active | On | |
| PARK BRAKE SW | Parking brake switch signal status | Parking brake switch is inactive | Off | |
| | | Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT-III) | On | G |
| FR RH IN SOL Operation status of each solenoid valve | | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off | Н |
| | Operation status of each selencid | Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT-III) | On | |
| FR RH OUT SOL Operation status of each solehold valve | | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off | J |
| | Operation status of each selencid | Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT-III) | On | |
| FR LH IN SOL | valve | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off | K |
| | Operation status of each selencid | Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT-III) | On | L |
| FR LH OUT SOL | valve | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off | Μ |
| | Operation status of each colonaid | Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT-III) | On | |
| RR RH IN SOL Operation status of each solenoid valve | | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off | Ν |
| | Operation status of each colonaid | Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT-III) | On | 0 |
| RR RH OUT SOL | valve | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off | Ρ |
| | Operation status of each solenoid | Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT-III) | On | |
| RR LH IN SOL | valve | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off | |

< ECU DIAGNOSIS INFORMATION >

| | | Data monitor | |
|--------------------------------|---|--|-------------------------------------|
| Monitor item | Display content | Condition | Reference value in normal operation |
| | Operation status of each colonaid | Actuator (solenoid valve) is active ("AC- TIVE TEST" in "ABS" with CONSULT-III) | On |
| RR LH OUT SOL | valve | When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON) | Off |
| | Mater and mater relay enoration | When the motor relay and motor are operating | On |
| MOTOR RELAT | | When the motor relay and motor are not operating | Off |
| ACTUATOR RLY | Actuator ralay operation | When the actuator relay is operating | On |
| (Note 2) | Actuator relay operation | When the actuator relay is not operating | Off |
| | ABS warning lamp | When ABS warning lamp is ON | On |
| | (Note 3) | When ABS warning lamp is OFF | Off |
| | VDC OFF indicator lamp | When VDC OFF indicator lamp is ON | On |
| | (Note 3) | When VDC OFF indicator lamp is OFF | Off |
| | VDC warning lamp | When VDC warning lamp is ON | On |
| SLIP/VDC | (Note 3) | When VDC warning lamp is OFF | Off |
| | | EBD is active | On |
| EBD SIGNAL | EBD operation | EBD is inactive | Off |
| | | ABS is active | On |
| ABS SIGNAL | ABS operation | ABS is inactive | Off |
| 700 0101141 | 700 / | TCS is active | On |
| ICS SIGNAL | ICS operation | TCS is inactive | Off |
| | | VDC is active | On |
| VDC SIGNAL | VDC operation | VDC is inactive | Off |
| | | In EBD fail-safe | On |
| EBD FAIL SIG | EBD fail-safe signal | EBD is normal | Off |
| | | In ABS fail-safe | On |
| ABS FAIL SIG | ABS fail-safe signal | ABS is normal | Off |
| T00 541 010 | 700 ()) ()) | In TCS fail-safe | On |
| TCS FAIL SIG | ICS fail-safe signal | TCS is normal | Off |
| | | In VDC fail-safe | On |
| VDC FAIL SIG | VDC fail-safe signal | VDC is normal | Off |
| | | Crank is active | On |
| CRANKING SIG | Crank operation | Crank is inactive | Off |
| USV [FL-RR] | | When actuator (switch-over valve) is ac- tive ("ACTIVE TEST" in "ABS" with CON- SULT-III) | On |
| (Note 2) VDC switch-over valve | When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON) | Off | |
| USV [FR-RL] | VDC switch-over valve | When actuator (switch-over valve) is ac- tive ("ACTIVE TEST" in "ABS" with CON- SULT-III) | On |
| (Note 2) | | When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON) | Off |

< ECU DIAGNOSIS INFORMATION >

| | | Data monitor | |
|-------------------------------|--|---|-------------------------------------|
| Monitor item | Display content | Condition | Reference value in normal operation |
| HSV [FL-RR] | | When actuator (switch-over valve) is ac- tive ("ACTIVE TEST" in "ABS" with CON- SULT-III) | On |
| (Note 2) | | When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON) | Off |
| HSV [FR-RL] | | When actuator (switch-over valve) is ac- tive ("ACTIVE TEST" in "ABS" with CON- SULT-III) | On |
| (Note 2) | | When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON) | Off |
| V/R OUTPUT | | When the solenoid valve relay is active (When ignition switch OFF) | On |
| (Note 2) | | When the solenoid valve relay is not ac- tive (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 CON- SULT-III) | On |
| | | When the actuator motor and motor relay are inactive | Off |
| LDP) APP SEN | Accelerator pedal position sensor sta- | Accelerator pedal is not depressed (Ignition switch ON) | 0 % |
| (Note 4) tus | | Depress accelerator pedal (Ignition switch ON) | 0 - 100 % |
| LDP) ICC MAIN SW | | ICC MAIN switch is ON | On |
| (Note 4) | | ICC MAIN switch is OFF | Off |
| LDP) LDP ON SW | Dynamic driver assistance switch | Dynamic driver assistance switch is ON | On |
| (Note 4) | Dynamic unver assistance switch | Dynamic driver assistance switch is OFF | Off |
| | | Front wiper is OFF | Stop |
| | | Front wiper stops at fail-safe operation | PRTCT |
| LDP) WIPER SIGNAL (Note 4) | Front wiper operation | Front wiper INT is operating | 1low |
| . , | | Front wiper LO is operating | Low |
| | | Front wiper HI is operating | High |
| LDP) BRAKE SW | Brake switch signal status | When brake pedal is not depressed | On |
| (Note 4) | | When brake pedal is depressed | Off |
| LDP) STOP LMP SW | Ston Jamp switch signal status | When brake pedal is depressed | On |
| (Note 4) | | When brake pedal is not depressed | Off |
| LDP) LDW SW | Warning systems switch condition | Warning systems switch is ON (Warning systems ON indicator is ON) | On |
| (Note 4) | Starting Systems Switch Condition | Warning systems switch is OFF (Warning systems ON indicator is OFF) | Off |
| | | Shift position is not received | Off |
| (Note 4) | Shift position | Selector lever position | P/R/N/D |
| · · · | | When using manual mode | MM 1st – MM 5th |

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

| | | Data monitor | | |
|---|--------------------------------------|--|-------------------------------------|--|
| Monitor item | Display content | Condition | Reference value in normal operation | |
| | | Turn signal is OFF. | Off | |
| LDP) TURN SIGNAL | Turn signal operation | Turn signal lamp RH is blinking | LH | |
| (Note 4) | rum signal operation | Turn signal lamp LH is blinking | RH | |
| | | Turn signal lamp LH and RH are blinking. | LH&RH | |
| LDP) YAW ORDER | Colculated torget your memory status | LDP is controlling to right side deviation | Negative value | |
| (Note 4) (Note 5) | Calculated larget yaw moment status | LDP is controlling to left side deviation | Positive value | |
| DP) WARN REQ Lane departure warning request status | | Lane departure warning is operating. (When using LDP) | On | |
| (Note 4) (Note 5) | | Lane departure warning is not operating. | Off | |
| LDP) WARN CONTROL | Warning main controllor status | When using LDP | On | |
| (Note 4) (Note 5) | | When using LDW | Off | |
| LDP) REDY SIGNAL | | LDP control is ready | On | |
| (Note 4) (Note 5) | LDF Teauy status | LDP control is not ready | Off | |
| | | LDP control is standby | STANDBY | |
| LDP) STATUS SIGNAL | LDP control status | Lane departure warning is operating (When using LDP) | WARN | |
| (Note 4) (Note 5) | | LDP control is stopped | MASK | |
| | | LDP control is OFF | Off | |
| | | Both side lane markers are detected | Detect | |
| LDP) CAMERA LOST (Note 4) (Note 5) | Lane marker detected condition | Deviate side lane marker is lost | Deviate | |
| | | Both side lane markers are lost | Both | |
| LDP) LANE UNCLEAR | Lano marker condition | Lane marker is unclear | On | |
| (Note 4) (Note 5) | | Lane marker is clear | 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 <u>BRC-90, "Description"</u>.
- Brake warning lamp: Refer to BRC-91, "Description".
- VDC OFF indicator lamp: Refer to BRC-92, "Description".
- VDC warning lamp: Refer to <u>BRC-93, "Description"</u>.
- 4: With LDP models.
- 5: The item displayed on "SPECIFIC DATA MONITOR" in "Special Function".

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) OSIS INFORMATION > [VDC/TCS/ABS]

< ECU DIAGNOSIS INFORMATION >

Wiring Diagram - BRAKE CONTROL SYSTEM -



< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]



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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) NOSIS INFORMATION > [VDC/TCS/ABS]

< ECU DIAGNOSIS INFORMATION >

А Signal Name [Specification] cation В Signal Name [Specifi PARKING BRAKE SWITCH STOP LAMP SWITCH 3 4 1 2 Ð С Color f Wire Connector No. Connector Name BG Connector Name D HIS. AIS. 66 100 Ň ſ 倨 Ε BRC G SHIELD × 8 ° C K ≥ (비망입 > 문 Ж Щ Ľ В В SB Н Signal Name [Specification] J WIRE TO WIRE **LH80FW** 96 97 97 92 98 98 109 94 Κ Color of Wire SHIELD Connector Type ≻ HB BB BB SB Connector Name BG BG BR H BG 强 HS. erminal No. 35 34 45 20 L Signal Name [Specification] Signal Name [Specification] Μ BRAKE CONTROL SYSTEM 12 4 : -USE BLOCK (J/B) WIRE TO WIRE 1 2 3 6 7 8 Ν 7F 16F Color of Wire SHIELP Color of Wire **Type** Ж œ ector Name Type × ¤ яя BG GR Connector Name Ο H.S. AIS. erminal No. erminal No. 9F 佴 伢

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Ρ

| BRAKE CONTROL SYSTEM Commetcer No. MI Connector Name FUSCE BLOCK (J/B) | Connector No. M6 Connector Name WIRE TO WIRE | 49 50 | | | - <u>-</u> |
|--|---|----------|--------------|-----------------|---|
| Connector Type NS06FW-M2 | Connector Type TH80MW-CS16-TM4 | 52 | ۲ <u>۵</u> – | r 1 | |
| | | 53 | ۵.> | İ. | Connector No. M19 |
| | | 58 | - 88 | 1 1 | Connector Name VDC OFF SWITCH |
| 3A 2414 | 4 24 Mint Mint Mint Mint Mint Mint Mint Mint | 57 | 50 | 1 | Connector Type TK06FGY |
| 0 2 2 6 4 5 4 A | | 59 | w | 1 | 4 |
| | 2 10 10 10 10 10 10 10 10 10 10 10 10 10 | 09 | _ | 1 | Unity. |
| | | 61 | σ | - | HS. |
| |] | 62 | SB | - | |
| Terminal Color Signal Name [Specification] | Terminal Color Signal Name [Specification] | 63 | 5 | - | 4 3 2 1 |
| No. of Wire | No. of Wire | 64 | 8 | 1 | |
| 1A GR – | | 65 | * | 1 | |
| 2A G | - 2 | 99 | R | I | - - - - |
| 3A L | | /9 | SHIELU | 1 | l erminal Color Signal Name [Specification] |
| | 4 SMIELU - | 99 80 | - ao | 1 1 | |
| | | En UZ | чр (° | . 1 | |
| | | 12 | 2 | , | , |
| | | 64 | 2 > | 1 | 4 M |
| § | | 73 | SB. | 1 | |
| | 12 BG - | 74 | BR | - [With ICC] | |
| Connector No. M3 | 13 L – | 74 | L | - [Without ICC] | Connector No. M24 |
| Connector Name FLISE RLOCK (J./R) | 14 R – | 75 | g | - | Connector Name DATA LINK CONNECTOR |
| | 15 P - | 76 | M | - [With ICC] | |
| Connector Type NS12FW-CS | 16 V – | 76 | GR | - [Without ICC] | Connector Type BD16FW |
| Ð | 17 SB – | 77 | œ | - [With ICC] | 4 |
| | | 12 | ۹. | - [Without ICC] | |
| H.S. | 20 BG - | 82 | _ (| - [With ICC] | |
| | 21 F | 0 | 2 > | | |
| 120 110 100 9C 8C 7C 6C | | 20 | - M | [OOI #104+IW] = | V 3 4 5 6 7 8 V |
| | 24 BR - | 80 | SB | - | |
| | 25 Y - | 81 | SB | - | |
| Terminal Color Simal Name [Snarification] | 26 V – | 82 | SB | 1 | Terminal Color Simal Name [Seacification] |
| No. of Wire | 27 G – | 83 | > | 1 | No. of Wire |
| 6C R – | 28 G – | 84 | ъ | 1 | 3 LG – |
| 7C B – | 31 L - | 85 | L | 1 | 4 B - |
| 9C BG - | 32 G - | 86 | ٩. | 1 | 5 B - |
| 10C L – | 33 B | 87 | × C | I | |
| 11G R - | 34 W | 88 | GR | t | - ~ |
| 120 BG = | | 06 | SHIELU | Т | |
| | 36 SHIELU | 16 | ** | ī | |
| | | 76 | - 6 | î. | |
| | 30 DG | 20 | | | |
| | | † 10 | r 6 | | |
| | - N | G6 | H. | 1 | |
| | 42 BG | 96 | ≤ - | 1 1 | |
| | 43 BG | 16 | _ | ť | |
| | 45 W - | 98 | SHIELD | | |
| | | | | | |
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< ECU DIAGNOSIS INFORMATION >

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]



Fail-Safe

INFOID:000000006347783

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.

BRC-103

< ECU DIAGNOSIS INFORMATION >

• 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/TCS control.

CAUTION:

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

LDW/LDP SYSTEM

- In case of malfunction in the LDW/LDP system, lane departure warning lamp is turned ON, and the condition of vehicle is the same as the condition of vehicles without LDW/LDP control.
- In case of malfunction in the VDC/TCS/ABS system, lane departure warning lamp is turned ON, and the condition of vehicle is the same as the condition of vehicles without LDW/LDP control.

DTC No. Index

| DTC | Items (CONSULT screen terms) | Reference |
|-------|------------------------------|---------------------|
| C1101 | RR RH SENSOR-1 | |
| C1102 | RR LH SENSOR-1 | |
| C1103 | FR RH SENSOR-1 | BRC-37, "DTC Logic" |
| C1104 | FR LH SENSOR-1 | |
| C1105 | RR RH SENSOR-2 | |
| C1106 | RR LH SENSOR-2 | |
| C1107 | FR RH SENSOR-2 | BRC-40, "DTC Logic" |
| C1108 | FR LH SENSOR-2 | |
| C1109 | BATTERY VOLTAGE [ABNORMAL] | BRC-45, "DTC Logic" |
| C1110 | CONTROLLER FAILURE | BRC-47, "DTC Logic" |
| C1111 | PUMP MOTOR | BRC-48, "DTC Logic" |
| C1115 | ABS SENSOR [ABNORMAL SIGNAL] | BRC-50, "DTC Logic" |
| C1116 | STOP LAMP SW | BRC-55, "DTC Logic" |
| C1120 | FR LH IN ABS SOL | BRC-60, "DTC Logic" |
| C1121 | FR LH OUT ABS SOL | BRC-62, "DTC Logic" |
| C1122 | FR RH IN ABS SOL | BRC-60, "DTC Logic" |
| C1123 | FR RH OUT ABS SOL | BRC-62, "DTC Logic" |
| C1124 | RR LH IN ABS SOL | BRC-60, "DTC Logic" |
| C1125 | RR LH OUT ABS SOL | BRC-62, "DTC Logic" |
| C1126 | RR RH IN ABS SOL | BRC-60, "DTC Logic" |
| C1127 | RR RH OUT ABS SOL | BRC-62, "DTC Logic" |
| C1130 | ENGINE SIGNAL 1 | BRC-64, "DTC Logic" |
| C1140 | ACTUATOR RELAY | BRC-65, "DTC Logic" |
| C1142 | PRESS SEN CIRCUIT | BRC-67, "DTC Logic" |
| C1143 | ST ANG SEN CIRCUIT | BRC-69, "DTC Logic" |
| C1144 | ST ANG SEN SIGNAL | BRC-71, "DTC Logic" |
| C1145 | YAW RATE SENSOR | BRC-72 "DTC Logic" |
| C1146 | SIDE G-SEN CIRCUIT | BIG-72, DTC Logic |

< ECU DIAGNOSIS INFORMATION >

(VDC/TCS/ABS)

| DTC | Items (CONSULT screen terms) | Reference | ^ |
|-------|------------------------------|----------------------------|-----|
| C1147 | USV LINE [FL-RR] | | А |
| C1148 | USV LINE [FR-RL] | | |
| C1149 | HSV LINE [FL-RR] | - <u>BRC-75, DTC Logic</u> | В |
| C1150 | HSV LINE [FR-RL] | | |
| C1153 | EMERGENCY BRAKE | BRC-47, "DTC Logic" | |
| C1154 | PNP POSI SIG | BRC-77, "DTC Logic" | С |
| C1155 | BR FLUID LEVEL LOW | BRC-78, "DTC Logic" | |
| C1170 | VARIANT CORDING | BRC-47, "DTC Logic" | D |
| C1185 | ACC CONT | BRC-81, "DTC Logic" | |
| C1B00 | LDP) CAMERA MALF | DAS-290, "DTC Logic" | |
| C1B04 | LDP) ICC STG SW MALF | DAS-291, "DTC Logic" | E |
| C1B05 | LDP) APP SEN MALF | DAS-292, "DTC Logic" | |
| C1B06 | LDP) TCM MALF | DAS-293, "DTC Logic" | BR |
| U0100 | LDP) ECM CAN CIR2 | DAS-294, "DTC Logic" | DIX |
| U0101 | LDP) TCM CAM CAN CIR2 | DAS-295, "DTC Logic" | |
| U0104 | LDP) ICC CAM CAN CIR2 | DAS-296, "DTC Logic" | G |
| U0405 | LDP) ICC CAM CAN CIR1 | DAS-297, "DTC Logic" | |
| U1000 | CAN COMM CIRCUIT | | |
| U1002 | SYSTEM COMM (CAN) | BRC-02, DTC LOGIC | П |
| U1100 | ACC COMM CIRCUIT | BRC-83, "DTC Logic" | |
| U1500 | LDP) CAM CAN CIR1 | DAS-298, "DTC Logic" | I |
| U1501 | LDP) CAM CAN CIR2 | DAS-299, "DTC Logic" | |

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EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:000000006347785

1.CHECK START

Check front and rear brake force distribution using a brake tester. Refer to <u>BR-47, "General Specifications"</u>. <u>Is the inspection result normal?</u>

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
- 2WD models: Refer to FAX-6, "Inspection".
- AWD models: Refer to FAX-15, "Inspection".
- Rear: Refer to <u>RAX-5, "Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following.

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

Is the inspection result normal?

YES >> GO TO 4.

- NO >> Replace wheel sensor or sensor rotor.
 - Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

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

YES >> Perform self-diagnosis for "ABS" with CONSULT-III.

NO >> Normal

UNEXPECTED PEDAL REACTION

| - | |
|---|--|
| | |
| | |

< SYMPTOM DIAGNOSIS >

А

UNEXPECTED PEDAL REACTION

| Diagnosis Procedure | |
|---|--|
| 1. CHECK BRAKE PEDAL STROKE | В |
| Check brake pedal stroke. Refer to BR-7, "Inspection and Adjustment". | |
| Is the stroke too large? | |
| YES >> • Bleed air from brake tube and hose. Refer to <u>BR-11</u>, "<u>Bleed</u> • Check brake pedal, brake booster, and master cylinder for r fluid leakage, etc. | C nount play, looseness, brake system |
| Brake pedal: Refer to <u>BR-7, "Inspection and Adjustment"</u>. Brake booster: Refer to <u>BR-13, "Inspection"</u>. Master cylinder: Refer to <u>BR-12, "Inspection"</u>. | D |
| NO >> GO TO 2. | E |
| 2. CHECK FUNCTION | |
| Disconnect ABS actuator and electric unit (control unit) connector to deac | tivate ABS. Check if braking force is |
| normal in this condition. Connect connector after inspection. | BRC |
| Is the inspection result normal? | |
| YES >> Normal | C |
| NO >> Check brake system. | 9 |
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THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:000000006347787

[VDC/TCS/ABS]

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

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.
ABS FUNCTION DOES NOT OPERATE

| < SYMPTOM DIAGNOSIS > | [VDC/TCS/ABS] | |
|--|------------------------|---|
| ABS FUNCTION DOES NOT OPERATE | | Λ |
| Diagnosis Procedure | INFOID:000000006347788 | A |
| CAUTION: ABS does not operate when speed is 10 km/h (6 MPH) or lower. 1.CHECK ABS WARNING LAMP DISPLAY | | В |
| Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or w | hen driving. | С |
| YES >> Normal NO >> Perform self-diagnosis for "ABS" with CONSULT-III. | | D |

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PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:000000006347789

[VDC/TCS/ABS]

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 for "ABS" with CONSULT-III.

3.SYMPTOM CHECK 3

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

Do symptoms occur?

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

| VEHICLE JERKS DURING VDC/TCS/ABS CONTROL | |
|--|--------------|
| < SYMPTOM DIAGNOSIS > [VDC/TCS/ABS] | |
| VEHICLE JERKS DURING VDC/TCS/ABS CONTROL | Δ |
| Diagnosis Procedure | 1 |
| 1. SYMPTOM CHECK | В |
| Check if the vehicle jerks during VDC/TCS/ABS control. | |
| Is the inspection result normal? | C |
| YES >> Normal. NO >> GO TO 2 | C |
| 2. CHECK SELF-DIAGNOSIS RESULTS | D |
| 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. | E |
| NO >> GO TO 3. | |
| 3. CHECK CONNECTOR | BRC |
| • Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector and check | |
| terminal for deformation, disconnection, looseness, etc. Securely connect connectors and perform self-diagnosis for "ABS" with CONSULT-III | G |
| Are self-diagnosis results indicated? | |
| YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. NO >> GO TO 4. | Н |
| 4. CHECK ECM AND A/T 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). | J |
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< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

| Symptom | Result |
|---|---|
| Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated. | T I · · · · · · · · · · · · · · · · · · · |
| Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads. | tion due to the VDC, TCS or ABS activation. |
| 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 may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal. | riority on the optimum traction (stability). |
| 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 con- |
| VDC may not operate normally or the ABS warning lamp and VDC warning lamp may illuminate, when run- ning on a special road that is extremely slanted (e.g. bank in a circuit course). | dition is restored, there is no malfunction. At |
| A malfunction may occur in the yaw rate/side G sensor system, when the vehicle turns sharply, such as dur- ing a spin turn, axle turn, or drift driving, while the VDC function is off (VDC warning lamp illuminated). | that time, erase the self- diagnosis memory. |
| 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 be- fore performing an in- spection on a chassis dynamometer.) |
| VDC warning lamp may simultaneously turn on when low tire pressure warning lamp turns on. | This is not a VDC sys- tem error but results from characteristic change of tire. |

< PRECAUTION > PRECAUTION PRECAUTIONS

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

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.

Precaution for Brake System

WARNING:

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

- Only use DOT 3 brake fluid. 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 ^M 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 crowfoot (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) connector or the battery negative terminal before performing the work.



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PRECAUTIONS

< PRECAUTION >

Precaution for Brake Control

[VDC/TCS/ABS]

• When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor

- 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.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or 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:000000006347795

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

[VDC/TCS/ABS]

INFOID:000000006347796

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< PREPARATION > PREPARATION PREPARATION

Special Service Tool

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

| Tool number (Kent-Moore No.) Tool name | | Description | С |
|---|--------------|------------------------------|---------------|
| ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia. | a b ZZA0701D | | D E BRC |
| ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia. | ZZA0632D | Installing rear sensor rotor | G |
| KV40104710 (—) a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia. | ZZA0632D | | J |
| Commercial Service Tool | | INFOID:00000006347797 | K |
| Tool name | | Description | L |
| | | | M |

1. Flare nut crowfoot a: 10 mm (0.39 in) /12 mm (0.47 in)

2. Torque wrench

Installing brake tube 2 S-NT360

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< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:000000006347798



1. Front LH wheel sensor connector 2. Front LH wheel sensor

3. Bracket

A. White line (slant line)

C: Vehicle front

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

NOTE:

The above figure shows left side. Right side is the mirror image.

FRONT WHEEL SENSOR : Removal and Installation

INFOID:000000006347799

REMOVAL

Be careful with the following when removing sensor.

- Do not twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor harness.
- Be careful to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.

INSTALLATION

Be careful with the following when installing wheel sensor. Tighten installation bolts to the specified torques. Refer to <u>BRC-116</u>, "FRONT WHEEL SENSOR : Exploded View".

- 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.

BRC-116

WHEEL SENSOR

< REMOVAL AND INSTALLATION >

• When you see the harness of the wheel sensor from the front side of the vehicle ensure that the white lines (A) are not twisted.

REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

 SEC. 476
 C

 Image: Comparison of the sensor connector
 C

4. Rear RH wheel sensor

C: Vehicle front

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

REAR WHEEL SENSOR : Removal and Installation

REMOVAL

Be careful with the following when removing sensor.

- Do not twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor harness.
- Be careful to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.

INSTALLATION

Be careful with the following when installing wheel sensor. Tighten installation bolts to the specified torques. Refer to <u>BRC-117, "REAR WHEEL SENSOR : Exploded View"</u>.

- 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 a rear LH wheel sensor, be sure to pass the wheel sensor harness under the breather hose.

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INFOID:000000006347801

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- A: Drift [SST: ST30720000 (J-25405)] B: Drift [SST: ST27863000 (—)]
- Install side flange. Refer to DLN-174, "2WD : Exploded View" (2WD), DLN-187, "AWD : Exploded View" (AWD).

SENSOR ROTOR FRONT SENSOR ROTOR

< REMOVAL AND INSTALLATION >

FRONT SENSOR ROTOR : Exploded View

Refer to FAX-7, "Exploded View" (2WD models), FAX-17, "Exploded View" (AWD models).

FRONT SENSOR ROTOR : Removal and Installation

REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to FAX-7, "Exploded View" (2WD models), FAX-17, "Exploded View" (AWD models).

INSTALLATION

SEC. 476

Sensor rotor cannot be disassembled. Install the sensor rotor together with hub bearing assembly. Refer to FAX-7, "Exploded View" (2WD models), FAX-17, "Exploded View" (AWD models). REAR SENSOR ROTOR

REAR SENSOR ROTOR : Exploded View

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1. Side flange 2. Rear wheel sensor rotor

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

REAR SENSOR ROTOR : Removal and Installation

REMOVAL

- Follow the procedure below to remove rear sensor rotor.
- Remove side flange. Refer to DLN-174, "2WD : Exploded View" (2WD), DLN-187, "AWD : Exploded View" (AWD).
- Using a bearing replacer (suitable tool) and puller (suitable tool), remove sensor rotor from side flange.

INSTALLATION

CAUTION:

- Do not reuse sensor rotor.
- Follow the procedure below to install rear sensor rotor.
- Using a drifts, press rear sensor rotor onto side flange.
 - C: Drift [SST: KV40104710 ()]

SENSOR ROTOR

23



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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [VDC/TCS/ABS]

< REMOVAL AND INSTALLATION >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:00000006347806

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- 6. Remove ABS actuator and electric unit (control unit) bracket mounting nuts.
- 7. Remove ABS actuator and electric unit (control unit) from vehicle.

Revision: 2011 October

BRC-119

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< REMOVAL AND INSTALLATION >

INSTALLATION

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

- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut crowfoot and torque wrench.
- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Do not remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to <u>BR-11, "Bleeding Brake System"</u>.
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure 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 <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

YAW RATE/SIDE G SENSOR

< REMOVAL AND INSTALLATION >

YAW RATE/SIDE G SENSOR

Exploded View

[VDC/TCS/ABS]

INFOID:000000006347808

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STEERING ANGLE SENSOR

< REMOVAL AND INSTALLATION >

STEERING ANGLE SENSOR

Exploded View

INFOID:000000006347810

[VDC/TCS/ABS]



1. Steering angle sensor

C: Vehicle front

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

Removal and Installation

INFOID:000000006347811

REMOVAL

- 1. Remove spiral cable assembly. Refer to <u>SR-14, "Exploded View"</u>.
- 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.
- When installing steering angle sensor, tighten it to the specified torque with an electric screwdriver. Be sure to tighten it completely with no floating and tilting.
- After work, make sure to adjust neutral position of steering angle sensor. Refer to <u>BRC-9</u>, "ADJUSTMENT <u>OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description</u>".

< SYSTEM DESCRIPTION > SYSTEM DESCRIPTION PREVIEW FUNCTION

System Description

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

- BRC The system detects the distance to the vehicle in front with the ICC sensor integrated unit of ICC (Full Speed Range) 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 or that the driver has the intention to operate the brake it supplies the power supply to the brake booster to apply pre-pressure and adjusts the brake 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.

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< SYSTEM DESCRIPTION >

PREVIEW FUNCTION [BRAKE ASSIST (WITH PREVIEW FUNCTION)]

Component Parts Location

INFOID:000000006891256



- 4. ECM Refer to <u>EC-38, "Component Parts</u> Location".
- 7. Booster solenoid/Release switch
- 10. ICC brake switch

1.

- A. Behind the combination meter
- D. Inside brake master cylinder cover
- Information display, ICC system warning lamp (On the combination meter)
- 5. ICC sensor integrated unit
- 8. Brake pressure sensor
- 11. IBA OFF switch
- B. Front bumper (LH)
- E. Upper side of brake pedal
- 6. ICC brake hold relay
- 9. Stop lamp switch
- 12. Brake booster control unit
- C. Engine room (LH)
- F. Luggage room (RH)

< SYSTEM DESCRIPTION >

PREVIEW FUNCTION [BRAKE ASSIST (WITH PREVIEW FUNCTION)]

Component Description

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×: Applicable

| Component | Function Description | | ription | Description |
|---|----------------------|----|-----------------|---|
| Component | *1 | *2 | *3 | Description |
| ICC sensor integrated unit | × | × | × | Refer to CCS-47, "Description". |
| ECM | × | × | × | Refer to CCS-82, "Description". |
| ABS actuator and electric unit (control unit) | × | × | × | Refer to <u>CCS-53, "Description"</u> . |
| BCM | × | | | Transmits the front wiper request signal to ICC sensor inte- grated unit via CAN communication. |
| ТСМ | × | × | | Refer to <u>CCS-123, "Description"</u> . |
| Unified meter and A/C amp. | × | × | × | Receives the meter display signal, ICC warning lamp signal, and IBA OFF indicator lamp signal from ICC sensor integrat- ed unit via CAN communication and transmits them to the combination meter via the communication line. |
| Combination meter | × | × | × | Performs the following operations using the signals received from the unified meter and A/C amp. via the communication line. Displays the ICC system operation status using the meter display signal. Illuminates the ICC system warning lamp using the ICC warning lamp signal. Illuminates the IBA OFF indicator lamp using the IBA OFF indicator lamp signal. |
| ICC brake switch | × | × | × | Refer to CCS-55 "Description" |
| Stop lamp switch | × | × | × | Note to <u>000 00, Description</u> . |
| ICC brake hold relay | × | | × | Refer to CCS-75, "Description". |
| Brake booster control unit | × | × | × | Refer to <u>CCS-93, "Description"</u> . |
| Brake booster | × | | × | Refer to CCS-93, "Description". |
| Brake pressure sensor | × | | × | Refer to <u>CCS-63, "Description"</u> . |
| Booster solenoid/Release switch | × | | × | Refer to <u>CCS-65, "Description"</u> for booster solenoid. Refer to <u>CCS-68, "Description"</u> for release switch. |
| ICC warning chime | × | × | × | Refer to CCS-136, "Description". |
| Steering angle sensor | × | | | Refer to <u>CCS-117, "Description"</u> . |
| IBA OFF switch | | | \times^{NOTE} | Refer to CCS-112, "Description". |

*1: Vehicle-to-vehicle distance control mode

*2: Conventional (fixed speed) cruise control mode

*3: IBA system and Brake Assist (With Preview Function)

NOTE:

Only IBA system uses

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[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

DTC/CIRCUIT DIAGNOSIS PREVIEW FUNCTION

Diagnosis Procedure

INFOID:000000006347815

1.BRAKE ASSIST (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 (Full Speed Range). Refer to CCS-5, "Work Flow".

SYMPTOM DIAGNOSIS NORMAL OPERATING CONDITION

Description

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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 >

PRECAUTION PRECAUTIONS

Precautions for Preview Function Service

- 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.

SYSTEM DESCRIPTION А INTELLIGENT BRAKE ASSIST System Description INFOID:000000006347818 В FUNCTION DESCRIPTION Intelligent Brake Assist (IBA) system warns the driver by a warning lamp and chime when there is a risk of a collision with the vehicle ahead in the traveling lane and the driver must take avoidance action immediately. The system helps reduce the rear-end collision speed by applying the brakes when it judges a collision can not be avoided. D **CAUTION:** The IBA system is a not collision avoidance system. 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, it may not provide a warning or brake in certain conditions. Е NOTE: The IBA system shares component parts and diagnosis with the ICC (Intelligent Cruise Control) system. New parts added to the IBA system is the IBA OFF indicator lamp in the combination meter and the IBA OFF BRC switch on the inside instrument driver lower panel.

 The ICC sensor integrated unit shares the parts with the ICC, but the IBA system will operate even when the ICC system is turned to OFF.

OPERATION DESCRIPTION

The IBA system uses a distance sensor located below the front bumper to measure the distance to a vehicle ahead. When the system judges that the distance gets shorter, the vehicle ahead detection indicator lamp on the combination meter blinks and the warning chime sounds.

To turn the system OFF/ON, push and hold the IBA OFF switch after starting the engine for more than 1 second.

NOTE:

- The system ON/OFF condition will be memorized even if the ignition switch turns OFF.
- The IBA system operates under the following conditions.
- The IBA system will function when the vehicle is driven at speeds of approximately 15 km/h (10 MPH) and above, and when the vehicle's speed is approximately 15 km/h (10 MPH) faster than that of the vehicle ahead.

Switch and Indicators



Fail-safe Indication

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INTELLIGENT BRAKE ASSIST

< SYSTEM DESCRIPTION >

| Condition | Description | Indication on the combination meter |
|---|---|-------------------------------------|
| When the sensor window is dirtyWhen the system malfunction | The system will be cancelled automatically with a beep sound. | |
| When driving into a strong light (i.e. sunlight) | The system is temporary unavailable. (Without the warning chime) | IBA OFF |

NOTE:

When the IBA turns OFF, the IBA OFF indicator lamp will illuminate.

Component Parts Location



INTELLIGENT BRAKE ASSIST

Information display, ICC system

< SYSTEM DESCRIPTION >

- 1. ICC steering switch
- 4. ECM Refer to <u>EC-38, "Component Parts</u> <u>Location"</u>.
- 7. Booster solenoid/Release switch
- 10. ICC brake switch
- A. Behind the combination meter
- D. Inside brake master cylinder cover

Component Description

warning lamp (On the combination meter)5. ICC sensor integrated unit nent Parts

2.

- 8. Brake pressure sensor
- 11. IBA OFF switch
- B. Front bumper (LH)
- E. Upper side of brake pedal
- ICC warning chime
 ICC brake hold relay
 ICC brake hold relay
 Stop lamp switch
 Brake booster control unit
 Engine room (LH)
 - F. Luggage room (RH)

INFOID:000000006891262

 \times : Applicable

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| Component | Function Description | | | Description | |
|---|----------------------|----|-------|---|--|
| Component | *1 | *2 | *3 | Description | |
| ICC sensor integrated unit | × | × | × | Refer to <u>CCS-47, "Description"</u> . | |
| ECM | × | × | × | Refer to CCS-82, "Description". | |
| ABS actuator and electric unit (control unit) | × | × | × | Refer to <u>CCS-53, "Description"</u> . | |
| BCM | × | | | Transmits the front wiper request signal to ICC sensor inte- grated unit via CAN communication. | |
| ТСМ | × | × | | Refer to <u>CCS-123, "Description"</u> . | |
| Unified meter and A/C amp. | × | × | × | Receives the meter display signal, ICC warning lamp signal, and IBA OFF indicator lamp signal from ICC sensor integrat- ed unit via CAN communication and transmits them to the combination meter via the communication line. | |
| Combination meter | × | × | × | Performs the following operations using the signals received from the unified meter and A/C amp. via the communication line. Displays the ICC system operation status using the meter display signal. Illuminates the ICC system warning lamp using the ICC warning lamp signal. Illuminates the IBA OFF indicator lamp using the IBA OFF indicator lamp signal. | |
| ICC brake switch | × | × | × | Defer to CCS EE "Description" | |
| Stop lamp switch | × | × | × | | |
| ICC brake hold relay | × | | × | Refer to CCS-75, "Description". | |
| Brake booster control unit | × | × | × | Refer to <u>CCS-93. "Description"</u> . | |
| Brake booster | × | | × | Refer to <u>CCS-93. "Description"</u> . | |
| Brake pressure sensor | × | | × | Refer to <u>CCS-63</u> , "Description". | |
| Booster solenoid/Release switch | × | | × | Refer to <u>CCS-65, "Description"</u> for booster solenoid. Refer to <u>CCS-68, "Description"</u> for release switch. | |
| ICC warning chime | × | × | × | Refer to <u>CCS-136, "Description"</u> . | |
| Steering angle sensor | × | | | Refer to CCS-117, "Description". | |
| IBA OFF switch | | | ×NOTE | Refer to <u>CCS-112, "Description"</u> . | |

*1: Vehicle-to-vehicle distance control mode

*2: Conventional (fixed speed) cruise control mode

*3: IBA system and Brake Assist (With Preview Function)

NOTE:

Only IBA system uses

DTC/CIRCUIT DIAGNOSIS INTELLIGENT BRAKE ASSIST

Diagnosis Procedure

INFOID:000000006347821

1.INTELLIGENT BRAKE ASSIST DIAGNOSIS

• The system will be cancelled automatically with a beep sound and IBA OFF indicator lamp on the combination meter will illuminate, when the system will not operate properly.

• When the IBA OFF indicator lamp continues to illuminate even if the IBA system is turned ON after the engine restarts, perform the trouble-diagnosis.

NOTE:

IBA system automatically returns to ON, when erasing self-diagnosis result for "ICC/ADAS" with CONSULT-III.

>> Go to ICC (Full Speed Range). Refer to CCS-5, "Work Flow".

SYMPTOM DIAGNOSIS > [INTELLIGENT BRAKE ASSIST]

SWITCH DOES NOT TURN ON / SWITCH DOES NOT TURN OFF

Symptom Table

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CAUTION:

Perform the self-diagnosis with CONSULT-III before the symptom diagnosis. Perform the trouble diagnosis if any DTC is detected.

| S | Inspection item/Reference page | | |
|---|--|--|-----|
| IBA system does not turn ON/OFF | IBA OFF indicator lamp is not turned ON⇔OFF when operating IBA OFF switch | BRC-133, "Diagnosis Procedure" | D |
| Description | | INFOID:000000006347823 | Е |
| IBA system does not turn ON/OFF IBA OFF indicator lamp does no lamp is not illuminated. IBA OFF indicator lamp does no lamp is illuminated. | . t illuminate even if the IBA OFF switch is t turn OFF even if the IBA OFF switch is | s depressed when IBA OFF indicator s depressed when IBA OFF indicator | BRO |
| NOTE: To turn the system OFF⇔ON, p second. The system ON/OFF condition v | oush and hold the IBA OFF switch after | starting the engine for more than 1 | G |
| Diagnosis Procedure | | INFOID:00000006347824 | Н |
| 1.PERFORM THE SELF-DIAGN | OSIS | | Ι |
| Perform "All DTC Reading" wi Check if the DTC is detected <u>152, "DTC Index"</u>. | th CONSULT-III. in self-diagnosis results for "ICC/ADAS | S" with CONSULT-III. Refer to <u>CCS-</u> | J |
| Is any DTC detected? YES >> GO TO 6. NO >> GO TO 2. 2.IBA OFF SWITCH INSPECTIO | N | | K |
| Start the engine. Check that "IBA SW" operates Is the inspection result normal? | s normally in "DATA MONITOR" for "ICC | ADAS" with CONSULT-III. | L |
| YES $>>$ GO TO 3. NO $>>$ GO TO 5. 3. CHECK IBA OFF INDICATOR | CIRCUIT | | M |
| Start the engine. Select the active test item "MI Check if the IBA OFF indicato | ETER LAMP" for "ICC/ADAS" with CON r lamp illuminates when the test item is | SULT-III. operated. | Ν |
| Is the inspection result normal?YES>> Refer to GI-38, "WorkNO>> GO TO 4. | Flow". | | 0 |
| 4. CHECK DATA MONITOR OF " | UNIFIED METER AND A/C AMP." | | Ρ |
| Check that "BA W/L" operates not IBA OFF switch is pushed and hol | mally in "DATA MONITOR" for "METEF d for more than 1 second. | X/M&A" with CONSULT-III, when the | |
| YES >> Replace the combinat | ion meter. Refer to <u>MWI-133, "Exploded</u> | <u>d View"</u> . | |

NO >> Replace the unified meter and A/C amp. Refer to <u>MWI-134, "Exploded View"</u>.

BRC-133

SWITCH DOES NOT TURN ON / SWITCH DOES NOT TURN OFF

< SYMPTOM DIAGNOSIS >

[INTELLIGENT BRAKE ASSIST]

5. CHECK IBA OFF SWITCH

Check IBA OFF switch. Refer to CCS-113, "Component Inspection (IBA OFF Switch)".

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.REPAIR OR REPLACE MALFUNCTIONING PARTS

Repair or replace malfunctioning parts.

>> GO TO 7. **7.**CHECK IBA SYSTEM

Check that IBA OFF indicator lamp turned ON⇔OFF, when operating IBA OFF switch.

>> INSPECTION END

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

PRECAUTIONS FOR INTELLIGENT BRAKE ASSIST

- The IBA system is a not collision avoidance system. 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, it may not provide a warning or brake in certain conditions.
- The system will not detect the following objects:
- Pedestrians, animals, or obstacles in the roadway
- Oncoming vehicles in the same lane
- The system will not detect under the following conditions:
- When the sensor gets dirty and it is impossible to detect the distance from the vehicle ahead.
- When driving into a strong light (i.e. sunlight)
- The sensor generally detects the signals returned from the reflectors on a vehicle ahead. Therefore, the system may not function properly under the following conditions:
- When the reflectors of the vehicle ahead are positioned high or close each other (including a small vehicle such as motorcycles).
- When the sensor gets dirty or and it is impossible to detect the distance from the vehicle ahead.
- When the reflectors on the vehicle ahead is missing, damaged or covered.
- When the reflector of the vehicle ahead is covered with dirt, snow and road spray.
- When visibility is low (such as rain, fog, snow, etc.).
- When snow or road spray from traveling vehicles are raised up.
- When dense exhaust or other smoke (black smoke) from vehicles reduces the sensor visibility.

- When excessively heavy baggage is loaded in the rear seat or the luggage room of vehicle.

- When abruptly accelerating or decelerating.
- On steep downhill or roads with sharp curves.
- When there is a highly reflective object near the vehicle ahead (ie,) very close to other vehicle, signboard, etc.
- While towing a trailer.
- Depending on certain road conditions (curved, beginning of a curve), vehicle conditions (steering position, vehicle position), or preceding vehicle's conditions (position in lane, etc.), the system may not function properly.
- The system may not function in offset conditions.
- The system may not function when the distance to the vehicle ahead is extremely close.
- The system detect highly reflective objects such as reflectors, signs, white markers, and other stationary objects on the road or near the traveling lane, and when in extreme conditions, detection of these objects may cause the system to function.
- The system is designed to automatically check the sensor's functionality. If the sensor is covered with ice, a transparent or translucent plastic bag, etc., the system may not detect them. In these instances the system may not be able to warn properly. Be sure to check and clean the sensor regularly.
- Excessive noise will interfere with the warning chime sound, and the chime may not be heard.
- Never step in under the brake pedal to avoid an accident when IBA system turns on.
- Sudden appearance of the vehicle in front (ie, it abruptly cuts in) may not be detected and the system may not warn soon enough.
- The system will be cancelled automatically with a beep sound and the IBA OFF indicator lamp will illuminate under the following conditions:
- When the sensor window is dirty
- When the system malfunctions



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< PRECAUTION > PRECAUTION

PRECAUTIONS

Precautions for IBA System Service

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- Never look straight into the laser beam discharger when adjusting laser beam aiming.
- Turn the IBA system OFF in conditions similar to driving, such as free rollers or a chassis dynamometer.
- Never use the ICC sensor integrated unit removed from vehicle. Never disassemble or remodel.
- Erase DTC when replacing parts of ICC system. Then check the operation of ICC system after adjusting laser beam aiming if necessary.
- Never change IBA system state ON/OFF without the consent of the customer.

NOTE:

IBA system automatically returns to ON, when erasing self-diagnosis result for "ICC/ADAS" with CONSUL-III.

< REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION IBA OFF SWITCH

| Re | moval and Installation | INFOID:000000006347827 | В |
|------------|---|------------------------|---|
| RE | MOVAL | | |
| 1. | Remove instrument lower panel LH. Refer to IP-13, "Removal and Installation". | | С |
| 2. | Disengage the pawl. Then remove IBA OFF switch. | | |
| INS Ins | STALLATION tall in the reverse order of removal. | | D |

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