SECTION BRC
BRAKE CONTROL SYSTEM

CONTENTS

VDC/TCS/ABS

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

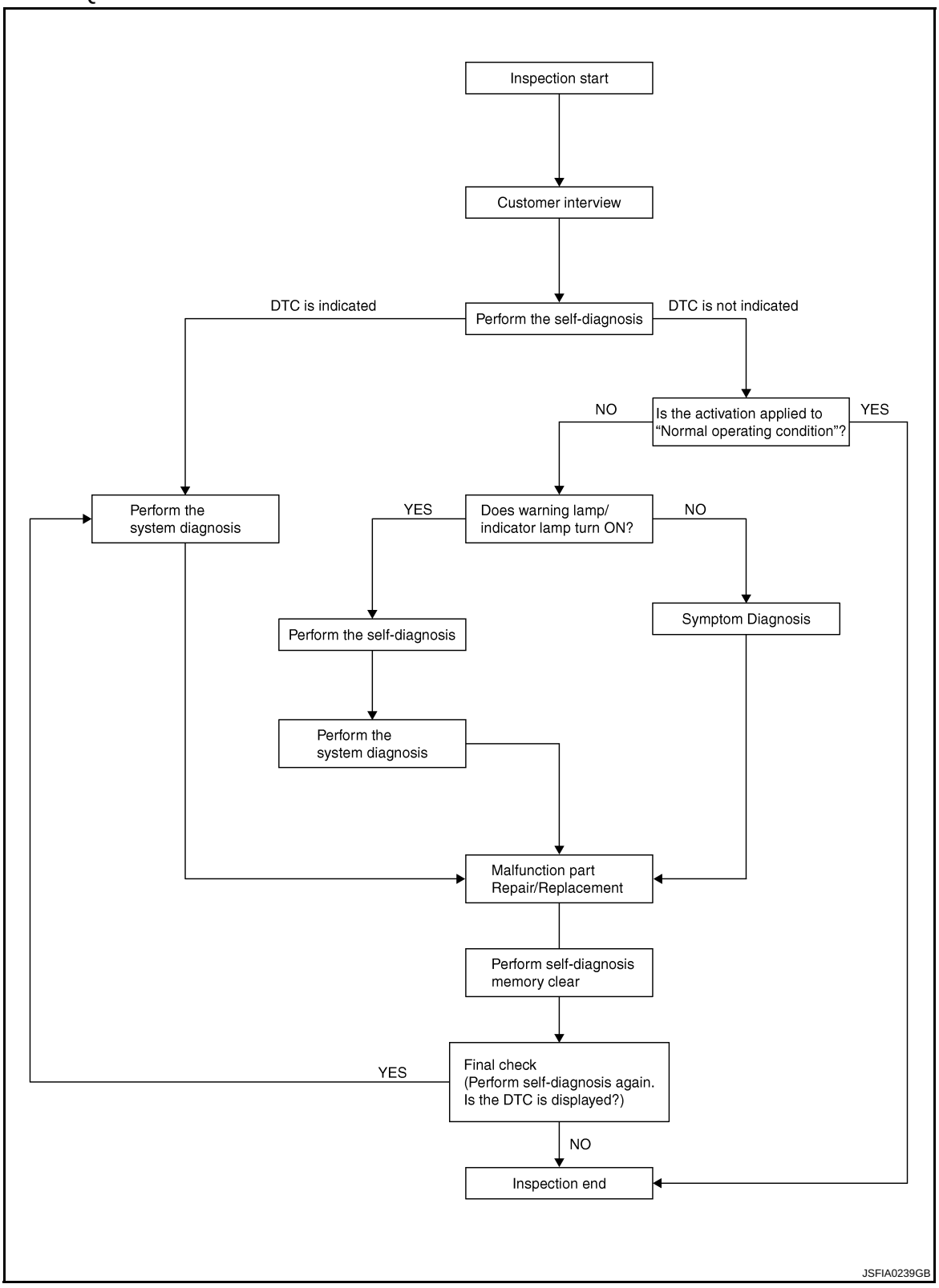
Work Flow

INFOID:0000000003132853

PRECAUTIONS FOR DIAGNOSIS

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

OVERALL SEQUENCE



DETAILED FLOW

1. COLLECT THE INFORMATION FROM THE CUSTOMER

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

>> GO TO 2.

2.PERFORM THE SELF-DIAGNOSIS

Check the DTC display with the self-diagnosis function.

Is there any DTC displayed?

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

3.PERFORM THE SYSTEM DIAGNOSIS

Perform the diagnosis applicable to the displayed DTC. Refer to BRC-95, "DTC No. Index".

>> GO TO 7.

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

Check that the symptom is a normal operation that is not considered a system malfunction. Refer to BRC-103, "Description".

Is the symptom a normal operation?

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

5.CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.

- ABS warning lamp: Refer to BRC-81, "Description".
- Brake warning lamp: Refer to BRC-82, "Description".
- VDC OFF indicator lamp: Refer to BRC-83, "Description".
- SLIP indicator lamp: Refer to BRC-84, "Description".

Is ON/OFF timing normal?

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

6.PERFORM THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom.

>> GO TO 7.

7.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 8.

8.MEMORY CLEAR

Perform self-diagnosis memory clear.

>> GO TO 9.

9.FINAL CHECK

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

Is no other DTC present and the repair completed?

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

Diagnostic Work Sheet

INFOID:0000000003132854

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

SFIA3265E

INSPECTION AND ADJUSTMENT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

INFOID:0000000003132855

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

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement

INFOID:0000000003132856

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

Perform the neutral position adjustment for the steering angle sensor.

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

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

INFOID:0000000003132857

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

×: Required –: Not required

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

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement

INFOID:0000000003132858

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

CAUTION:

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

1. ALIGN THE VEHICLE STATUS

Stop the vehicle with front wheels in straight-ahead position.

>> GO TO 2.

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

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

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

3. After approximately 10 seconds, touch “END”.
NOTE:
After approximately 60 seconds, it ends automatically.
4. Turn ignition switch OFF, then turn it ON again.
CAUTION:
Be sure to perform above operation.

>> GO TO 3.

3. CHECK DATA MONITOR

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

STR ANGLE SIG : 0±2.5°

Is the steering angle within the specified range?

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

4. ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memories of the ABS actuator and electric unit (control unit), ECM and ICC.
- ABS actuator and electric unit (control unit): Refer to BRC-30, "CONSULT-III Function".
- ECM: Refer to EC-113, "CONSULT-III Function".
- ICC: Refer to CCS-24, "CONSULT-III Function (ICC)".

Are the memories erased?

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

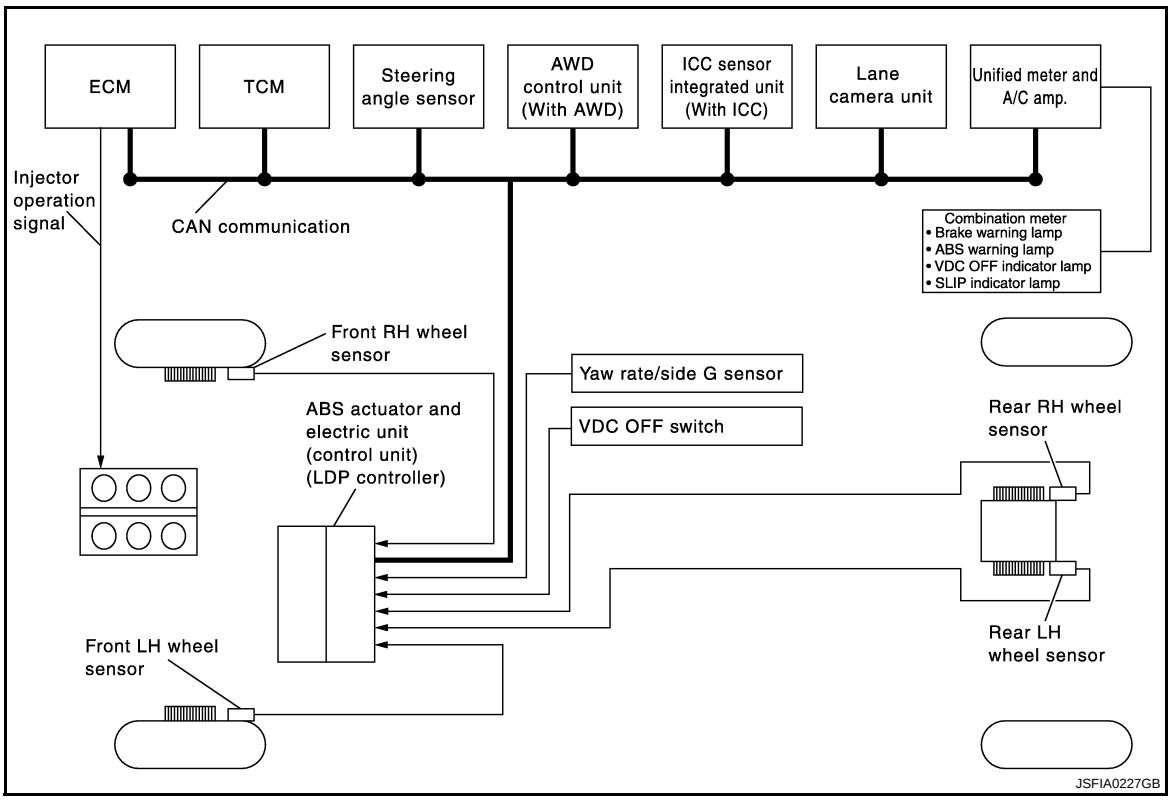
FUNCTION DIAGNOSIS

VDC

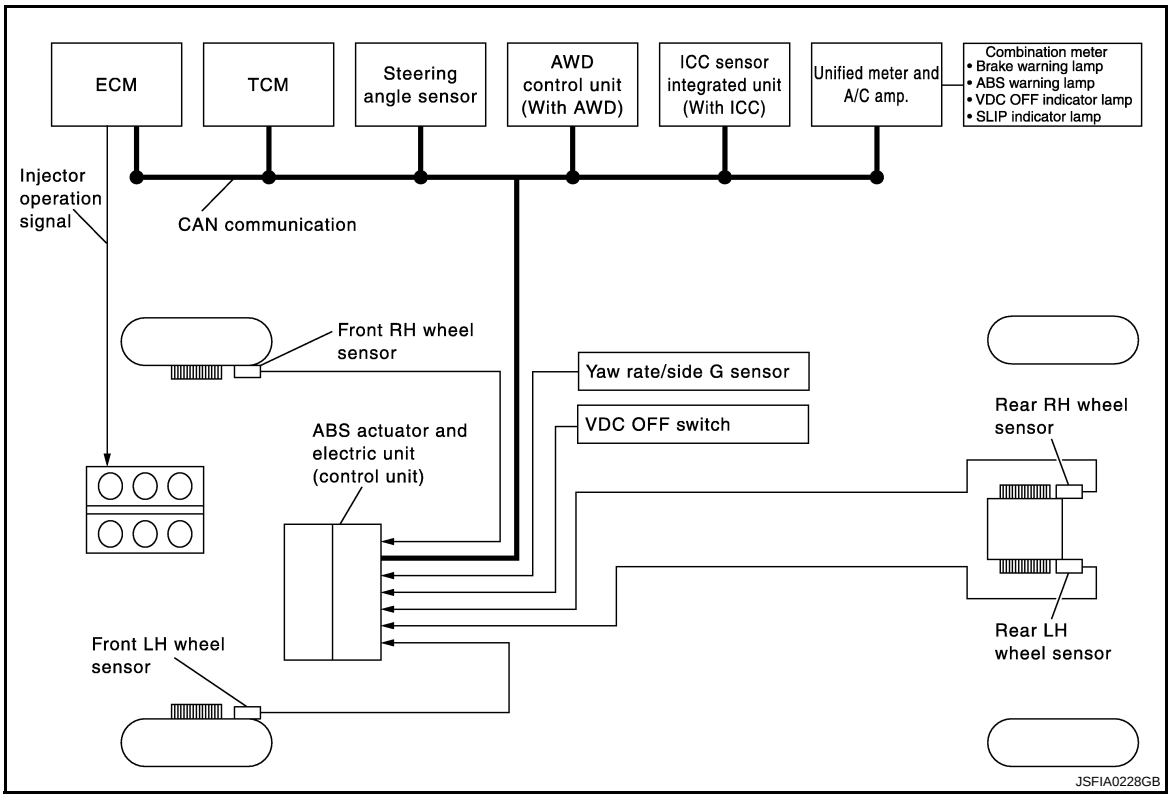
System Diagram

INFOID:0000000003132859

With LDP



Without LDP



System Description

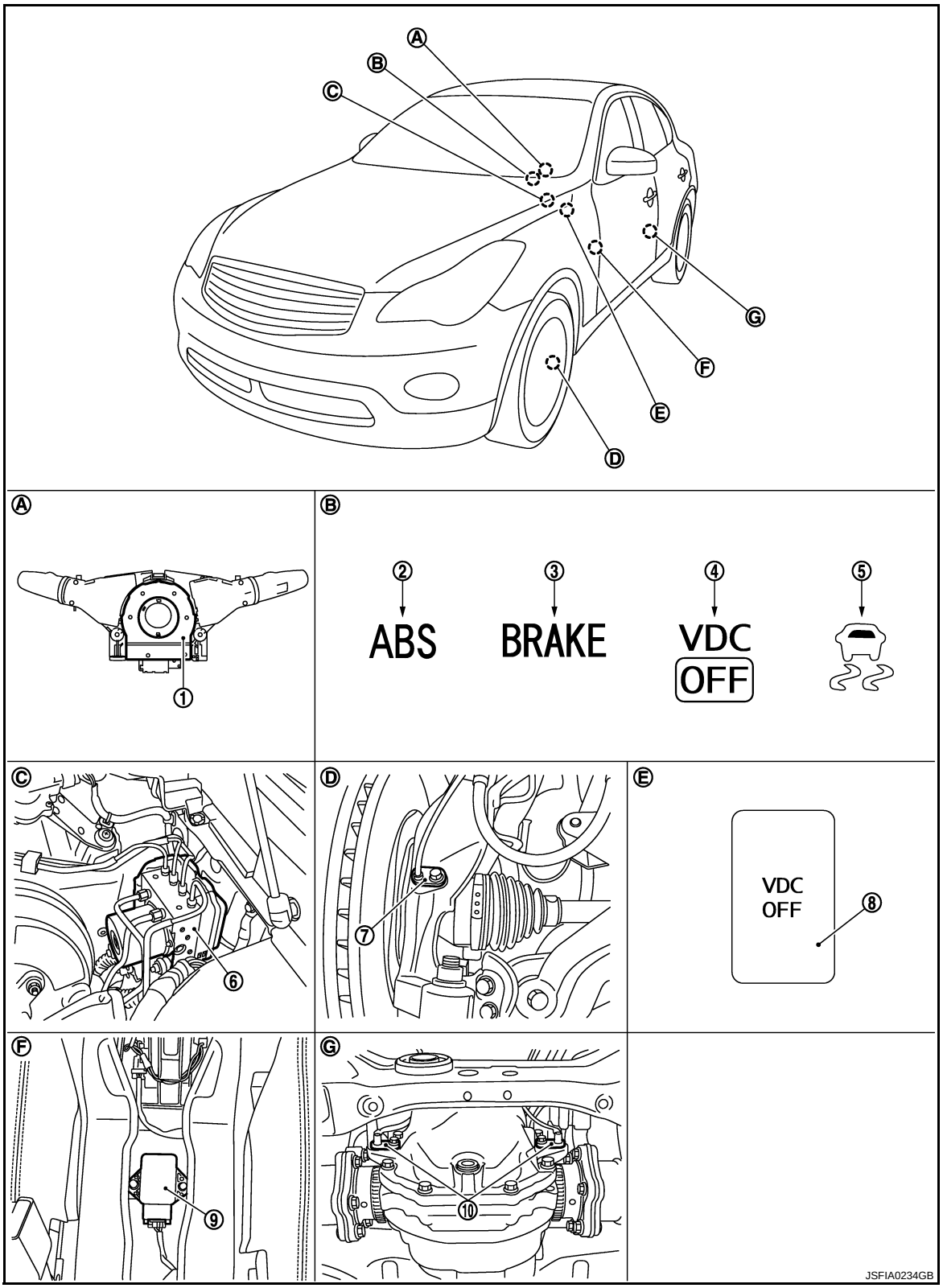
INFOID:0000000003132860

- 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 SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.

Component Parts Location

INFOID:0000000003132861

For USA

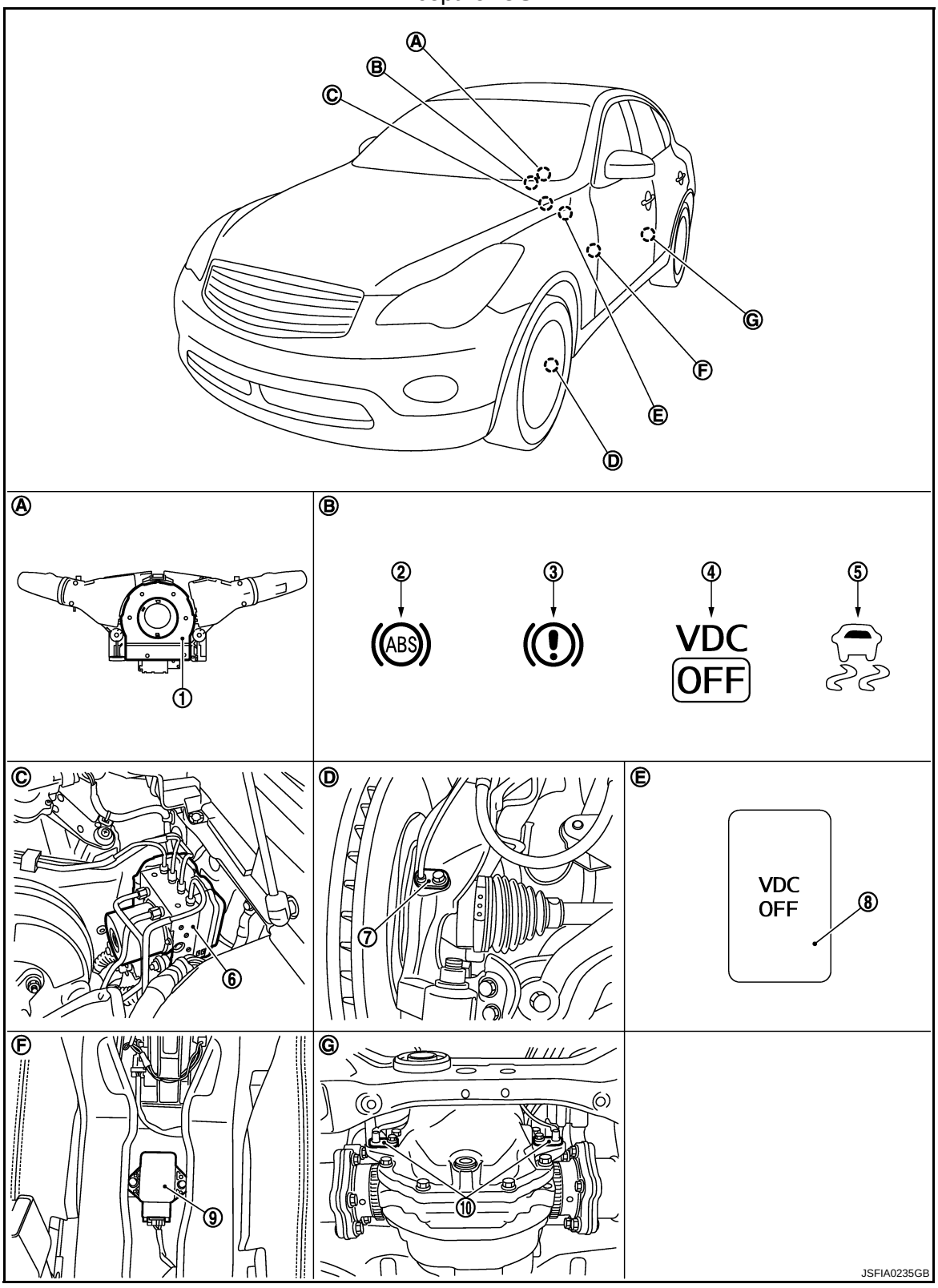


1. Steering angle sensor
2. ABS warning lamp
3. Brake warning lamp
4. VDC OFF indicator lamp
5. SLIP indicator lamp
6. ABS actuator and electric unit (control unit)

7. Front wheel sensor
8. VDC OFF switch
9. Yaw rate/side G sensor
10. Rear wheel sensor

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

Except for USA



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

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

Component Description

INFOID:0000000003132862

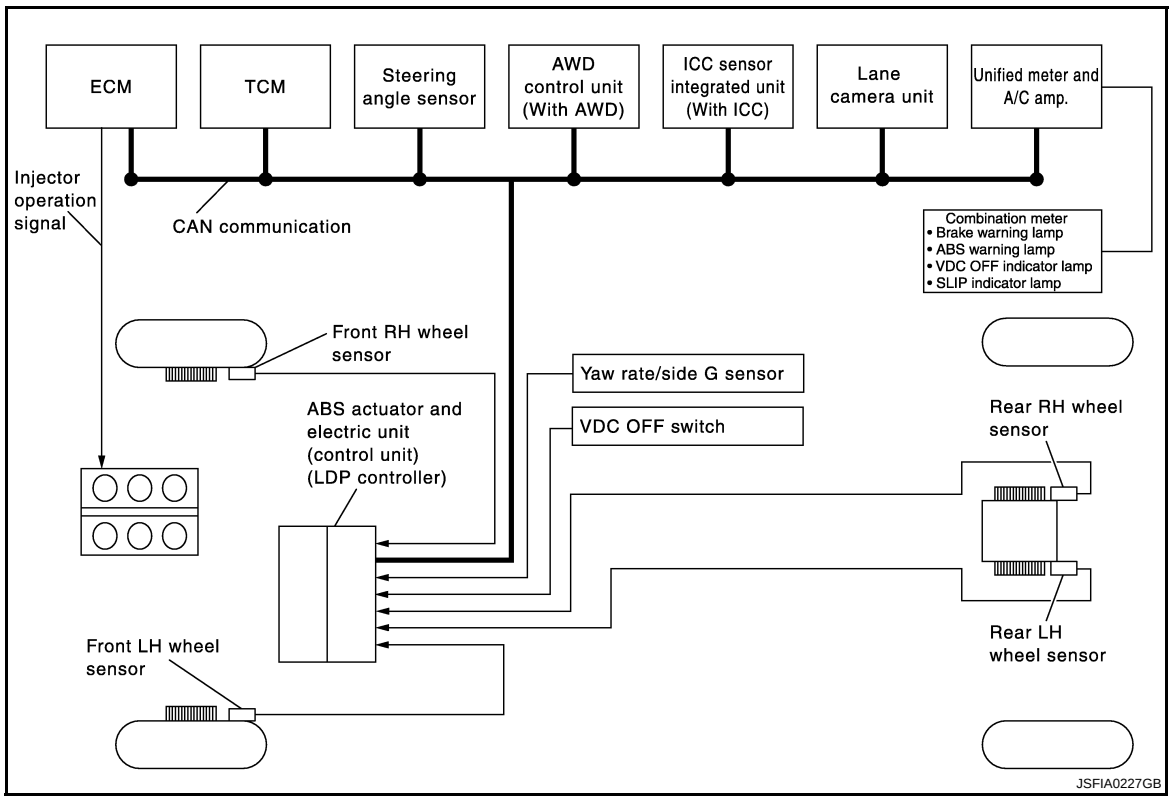
Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-44, "Description"
	Motor	
	Actuator relay (main relay)	BRC-46, "Description"
	Solenoid valve	BRC-53, "Description"
	Pressure sensor	BRC-58, "Description"
	VDC switch-over valve (USV1, USV2, HSV1, HSV2)	BRC-66, "Description"
Wheel sensor		BRC-35, "Description"
Yaw rate/side G sensor		BRC-63, "Description"
Steering angle sensor		BRC-60, "Description"
VDC OFF switch		BRC-79, "Description"
ABS warning lamp		BRC-81, "Description"
Brake warning lamp		BRC-82, "Description"
VDC OFF indicator lamp		BRC-83, "Description"
SLIP indicator lamp		BRC-84, "Description"

TCS

System Diagram

INFOID:0000000003430100

With LDP



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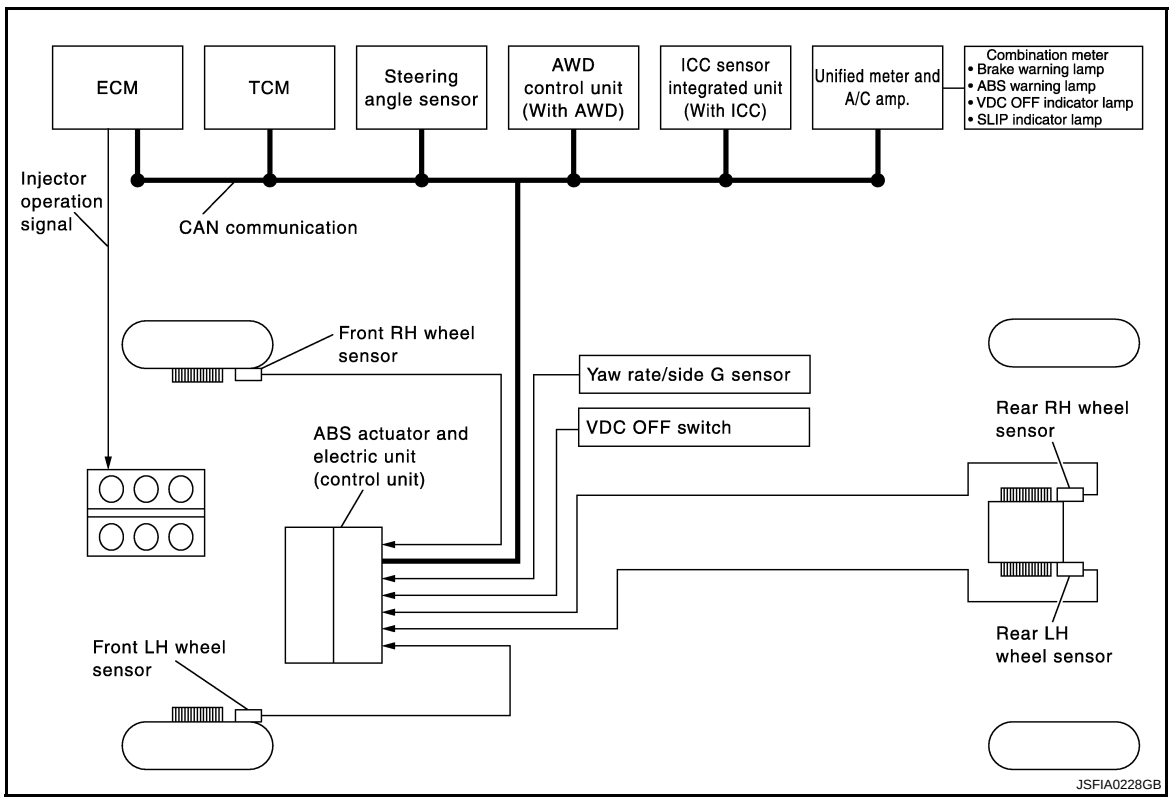


System Description

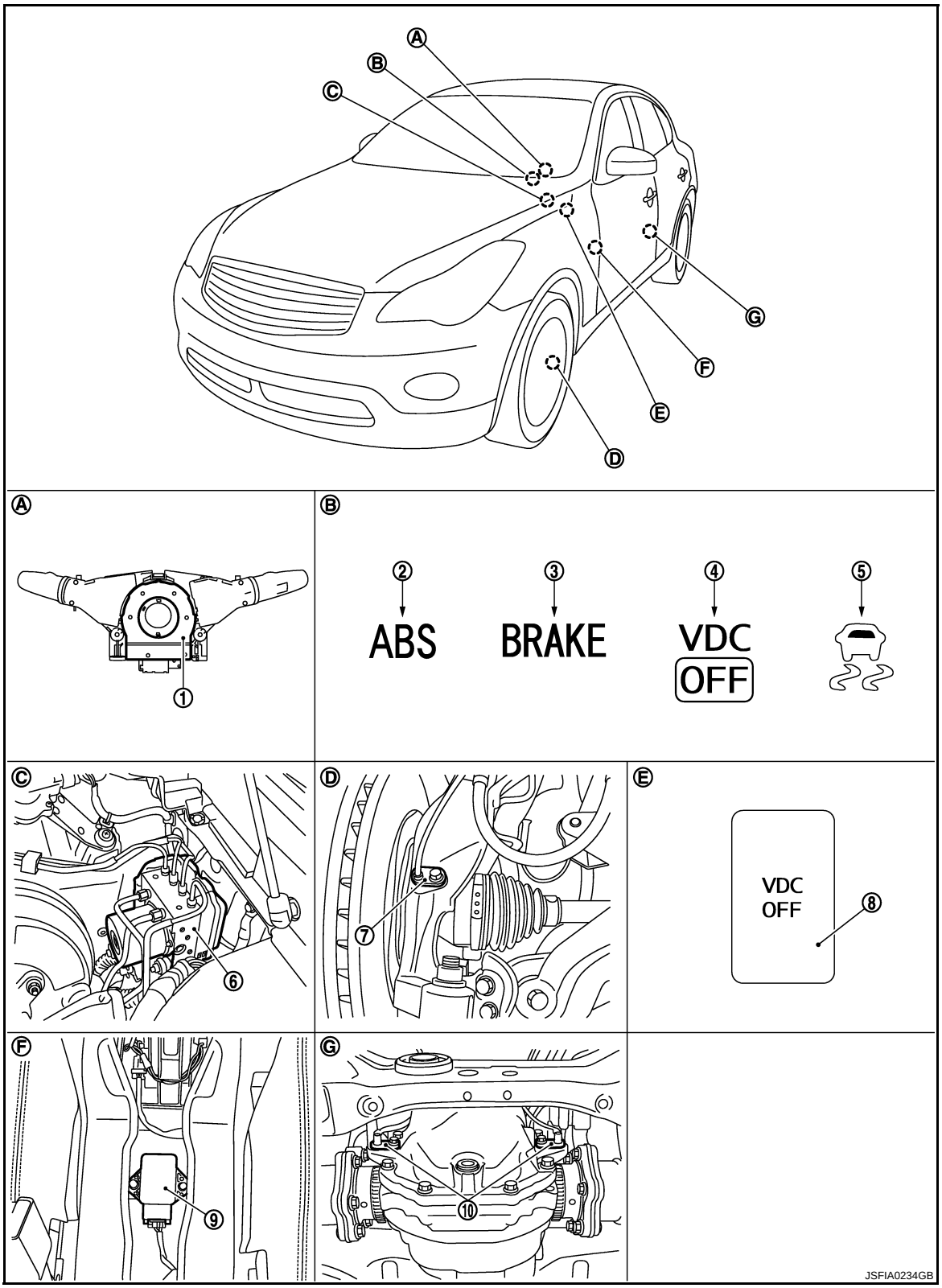
INFOID:0000000003132864

- 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 SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.

Component Parts Location

INFOID:0000000003430101

For USA

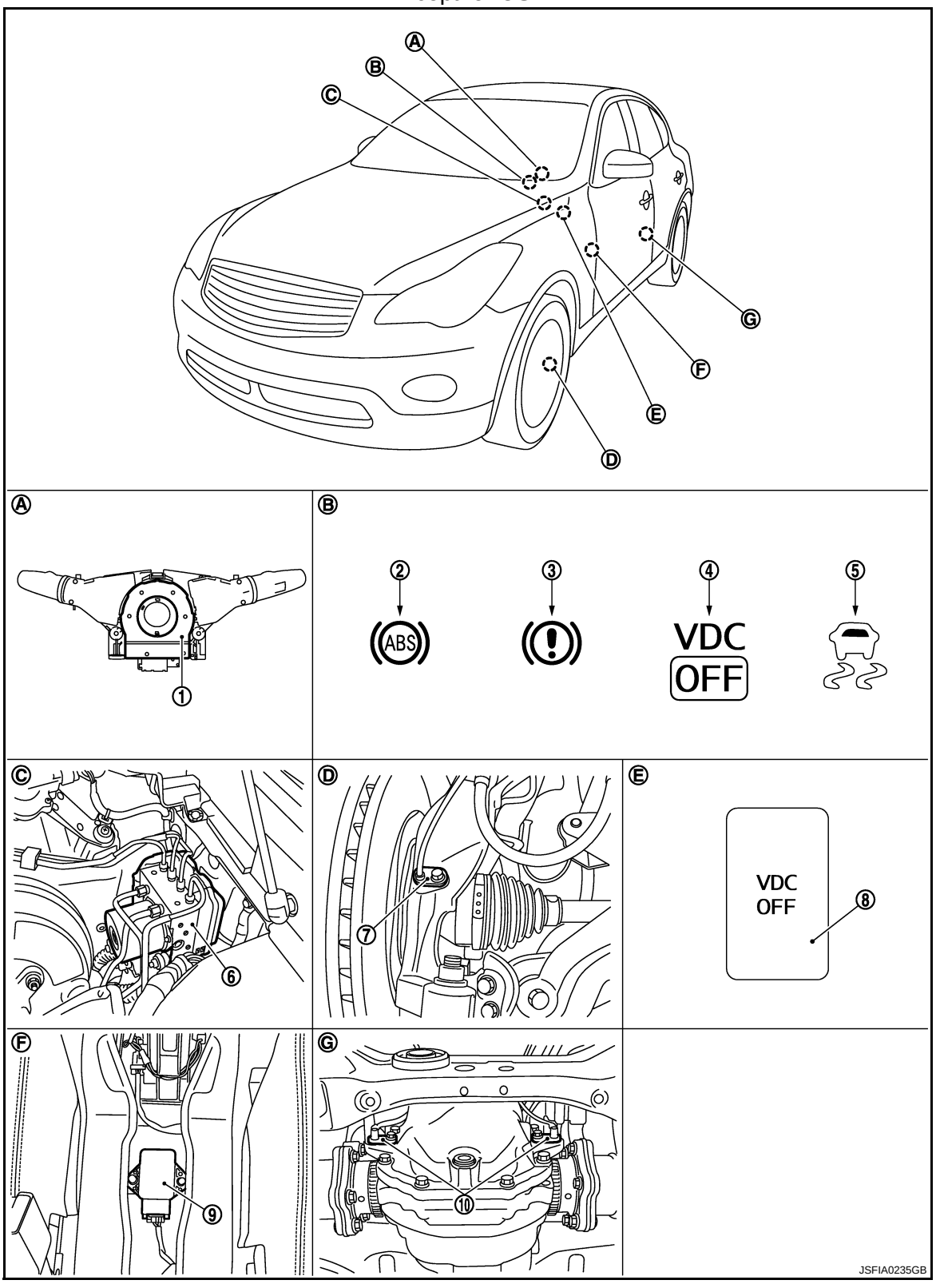


1. Steering angle sensor
2. ABS warning lamp
3. Brake warning lamp
4. VDC OFF indicator lamp
5. SLIP indicator lamp
6. ABS actuator and electric unit (control unit)

7. Front wheel sensor
8. VDC OFF switch
9. Yaw rate/side G sensor
10. Rear wheel sensor

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

Except for USA



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

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

Component Description

INFOID:0000000003430102

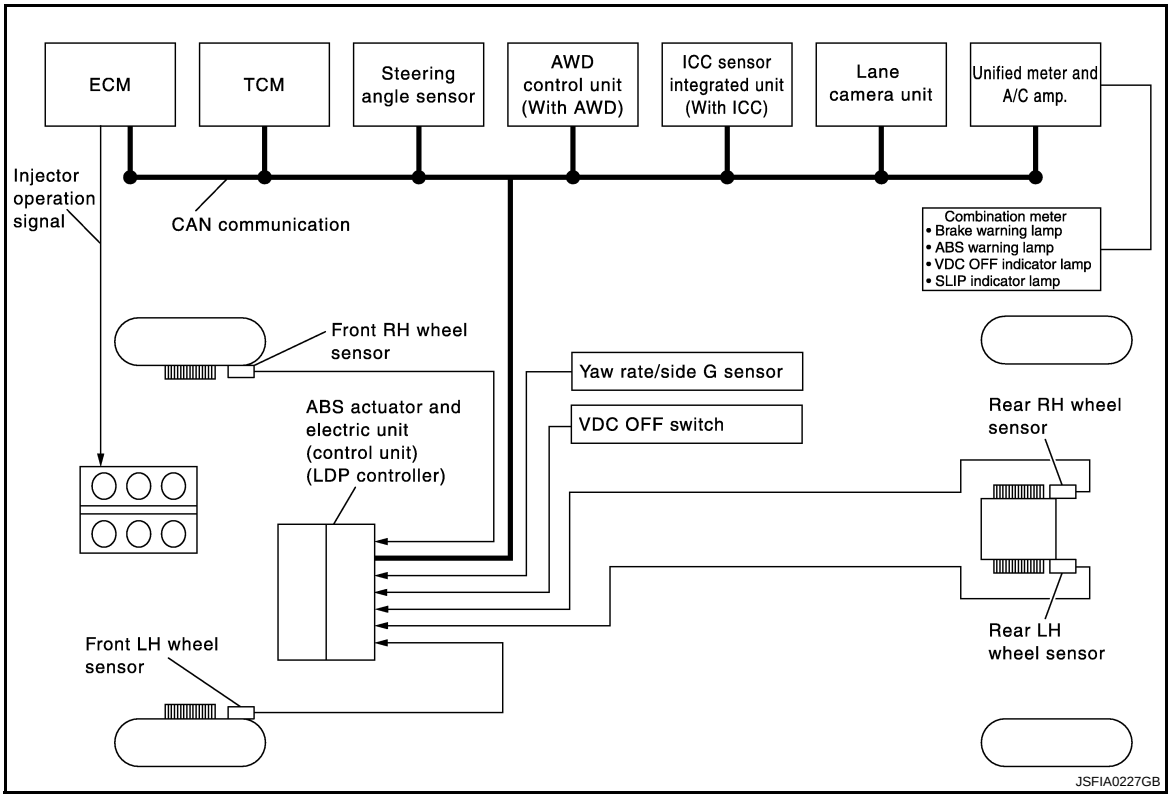
Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-44, "Description"
	Motor	
	Actuator relay (main relay)	BRC-46, "Description"
	Solenoid valve	BRC-53, "Description"
	Pressure sensor	BRC-58, "Description"
	VDC switch-over valve (USV1, USV2, HSV1, HSV2)	BRC-66, "Description"
Wheel sensor		BRC-35, "Description"
Yaw rate/side G sensor		BRC-63, "Description"
Steering angle sensor		BRC-60, "Description"
VDC OFF switch		BRC-79, "Description"
ABS warning lamp		BRC-81, "Description"
Brake warning lamp		BRC-82, "Description"
VDC OFF indicator lamp		BRC-83, "Description"
SLIP indicator lamp		BRC-84, "Description"

ABS

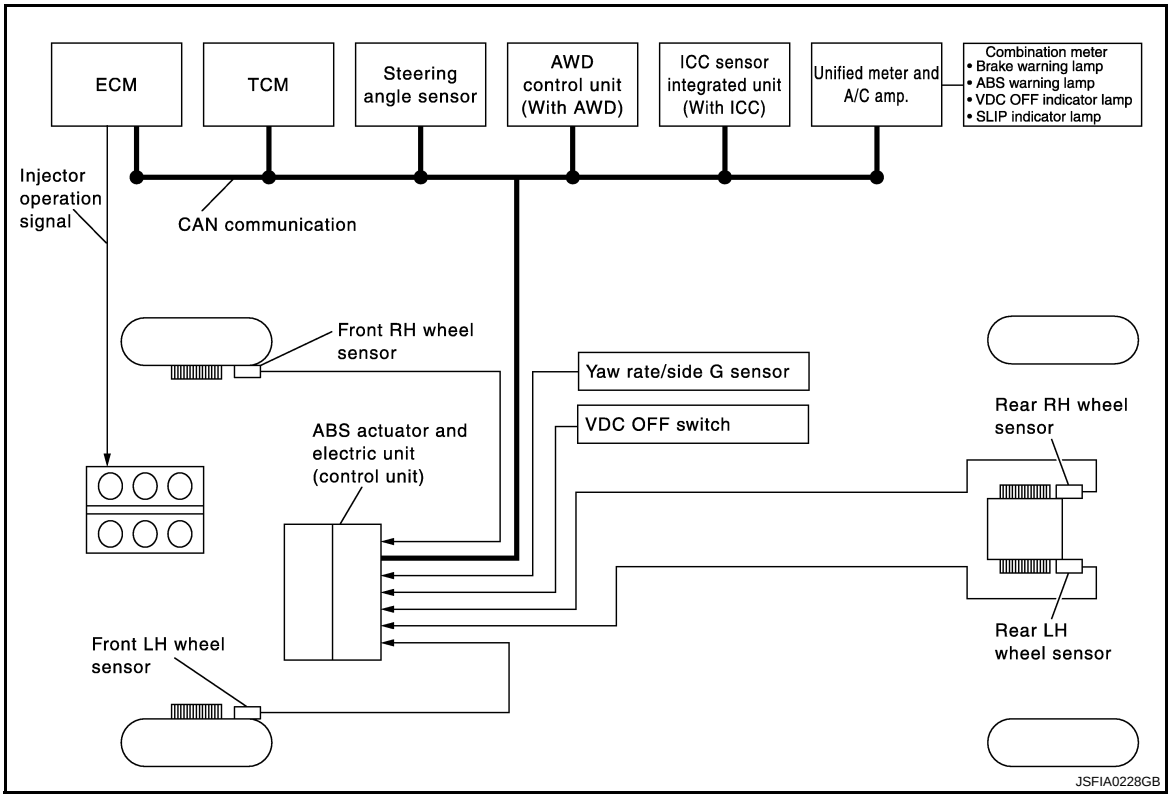
System Diagram

INFOID:0000000003430103

With LDP



Without LDP



System Description

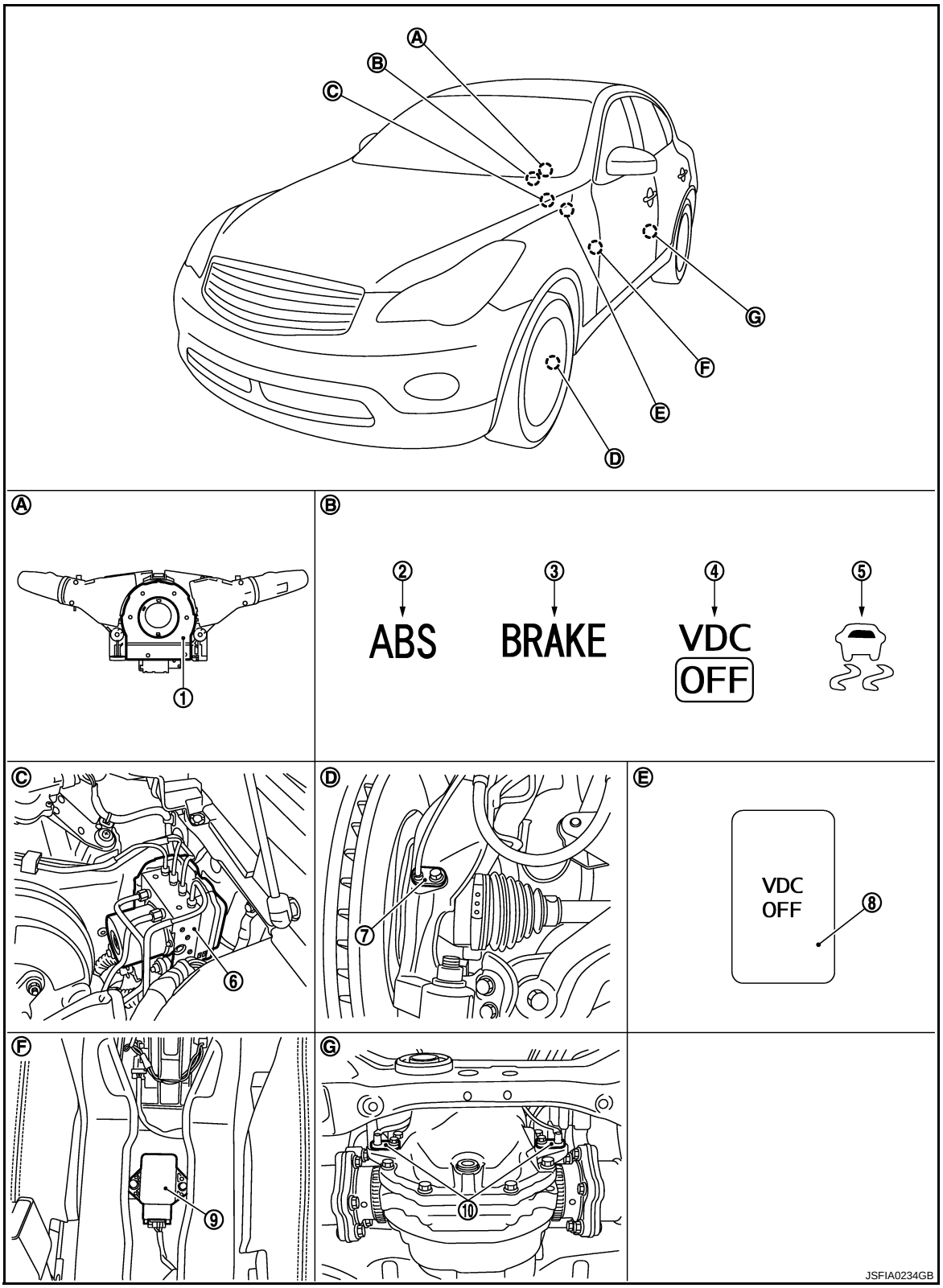
INFOID:0000000003132868

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

Component Parts Location

INFOID:0000000003430104

For USA

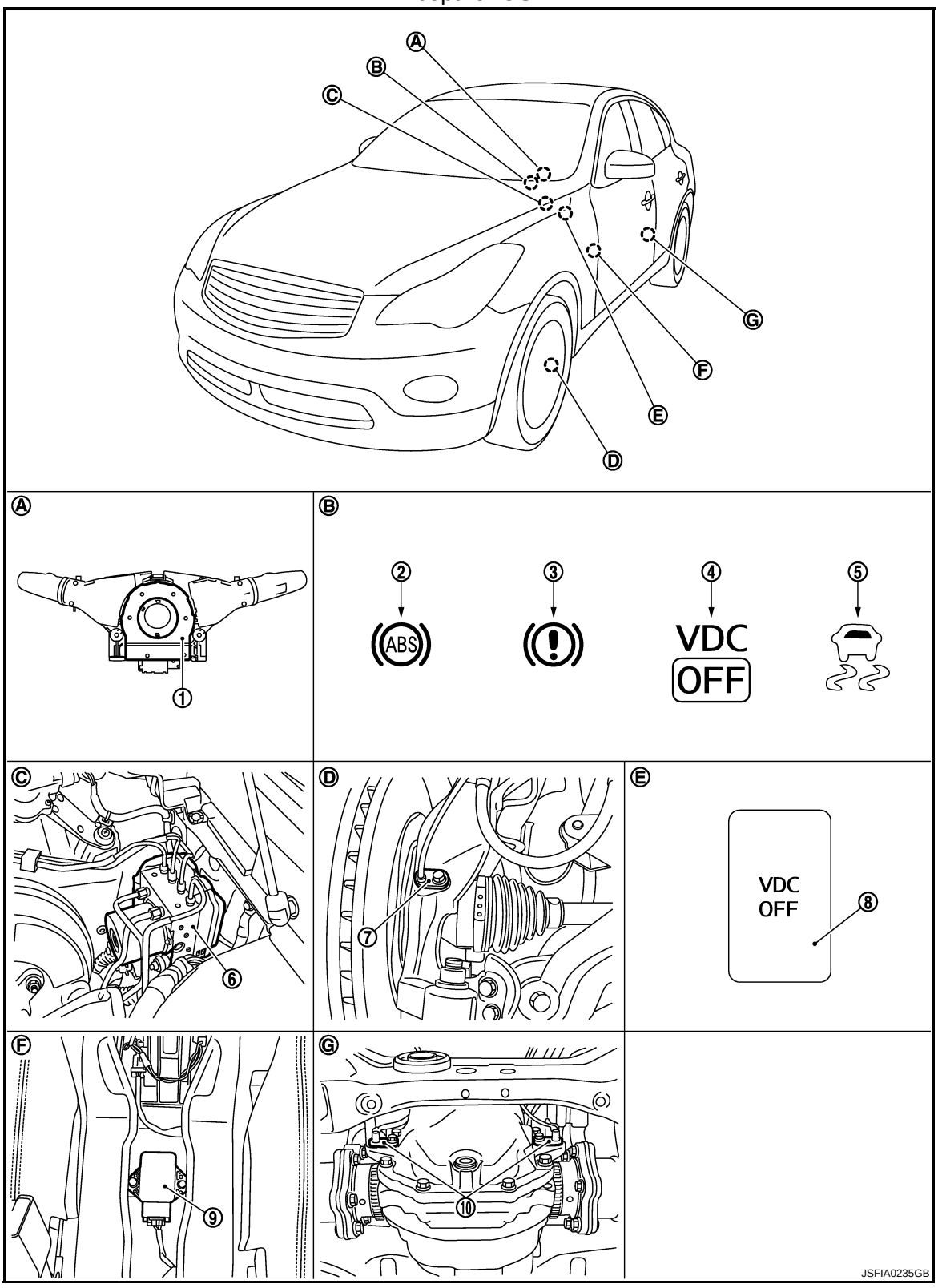


1. Steering angle sensor
2. ABS warning lamp
3. Brake warning lamp
4. VDC OFF indicator lamp
5. SLIP indicator lamp
6. ABS actuator and electric unit (control unit)

7. Front wheel sensor
8. VDC OFF switch
9. Yaw rate/side G sensor
10. Rear wheel sensor

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

Except for USA



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

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

Component Description

INFOID:0000000003430105

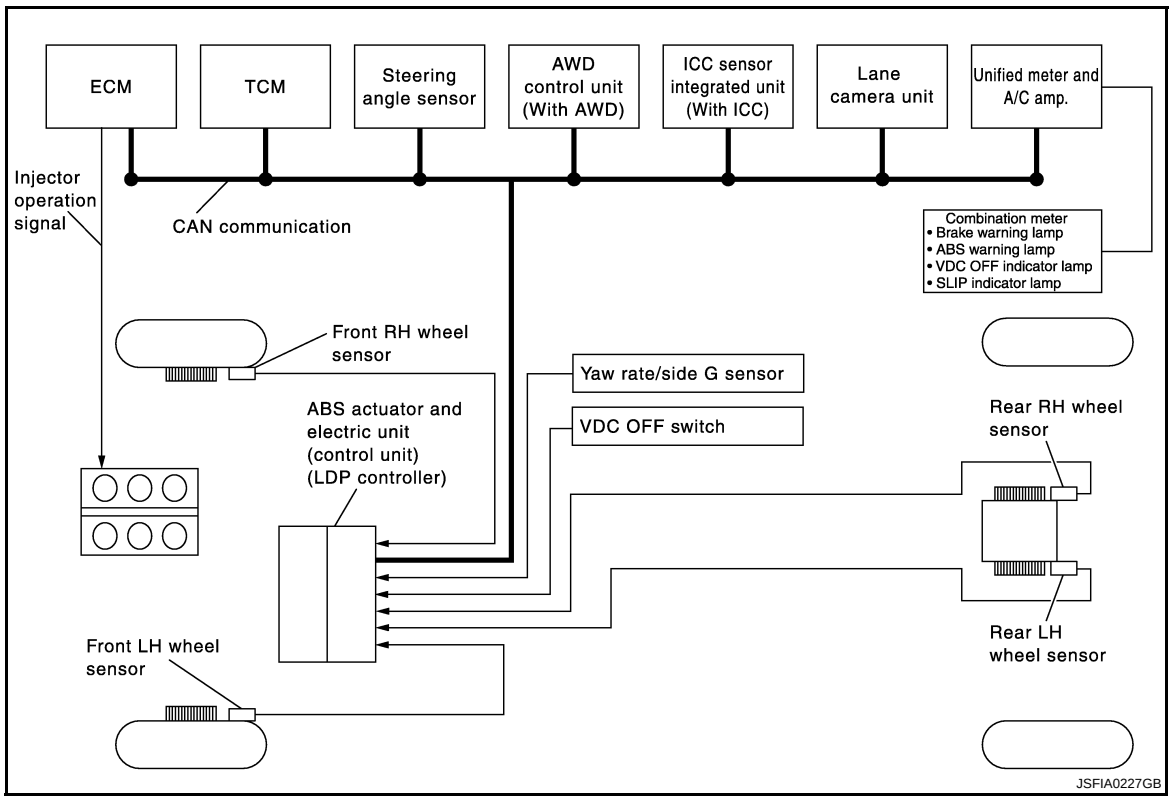
Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-44, "Description"
	Motor	
	Actuator relay (main relay)	BRC-46, "Description"
	Solenoid valve	BRC-53, "Description"
	Pressure sensor	BRC-58, "Description"
	VDC switch-over valve (USV1, USV2, HSV1, HSV2)	BRC-66, "Description"
Wheel sensor		BRC-35, "Description"
Yaw rate/side G sensor		BRC-63, "Description"
Steering angle sensor		BRC-60, "Description"
VDC OFF switch		BRC-79, "Description"
ABS warning lamp		BRC-81, "Description"
Brake warning lamp		BRC-82, "Description"
VDC OFF indicator lamp		BRC-83, "Description"
SLIP indicator lamp		BRC-84, "Description"

EBD

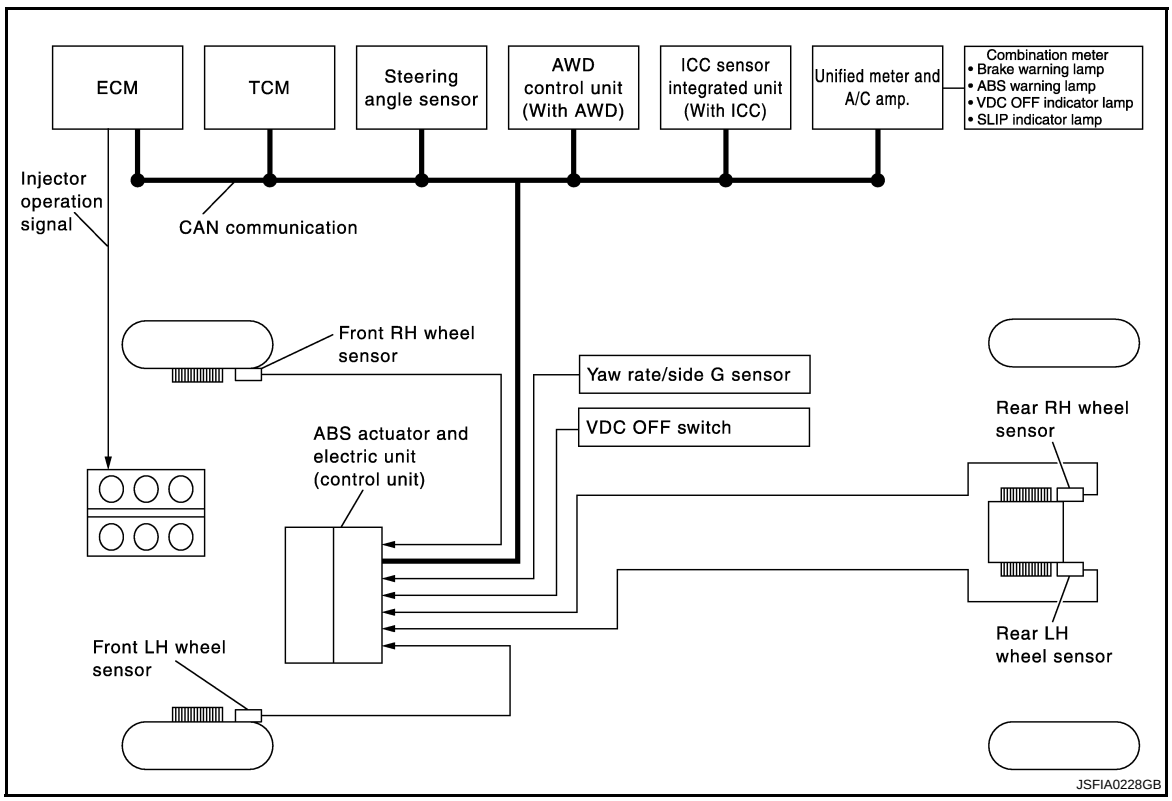
System Diagram

INFOID:0000000003430106

With LDP



Without LDP



System Description

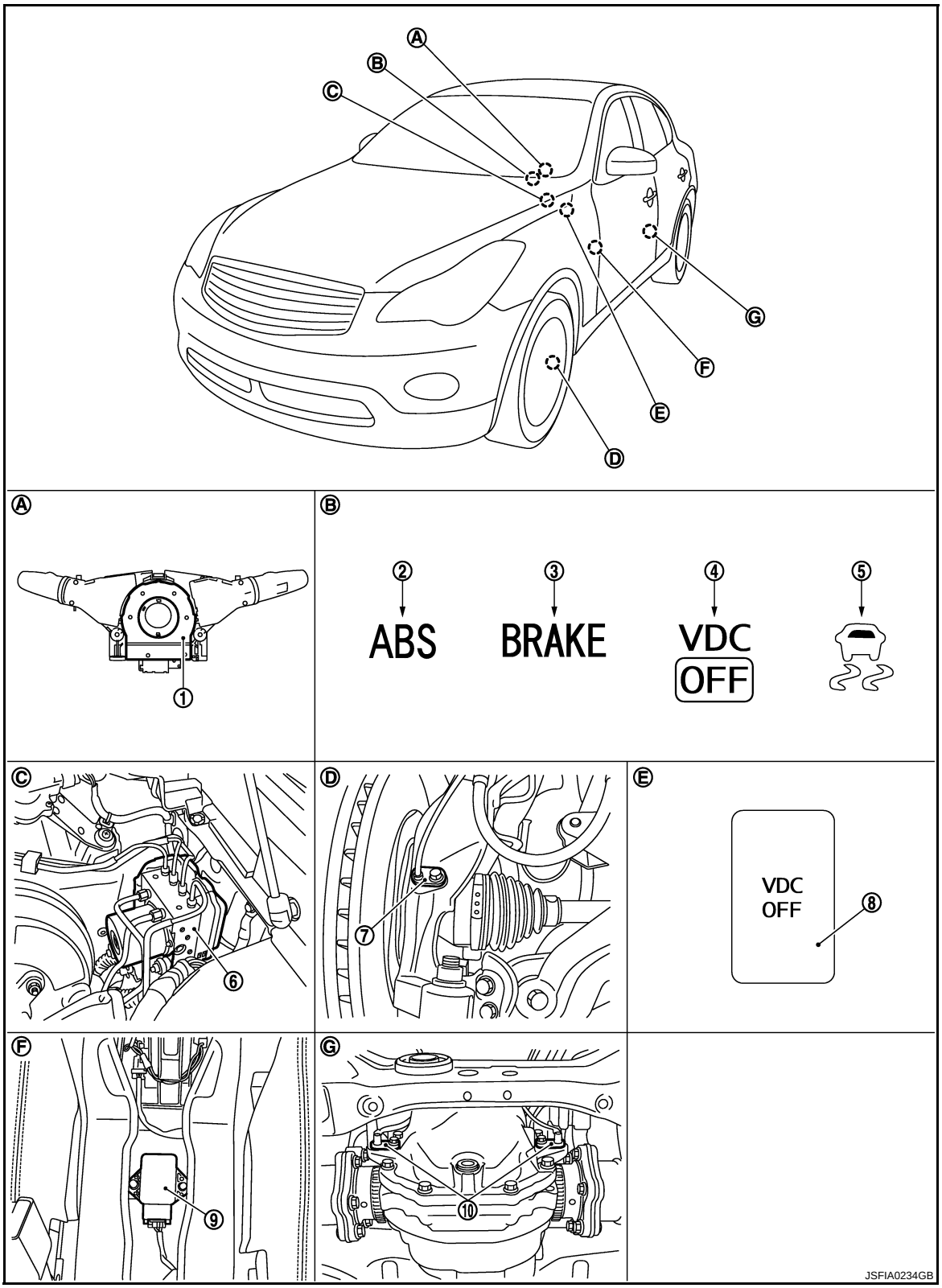
INFOID:0000000003132872

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

Component Parts Location

INFOID:0000000003430107

For USA

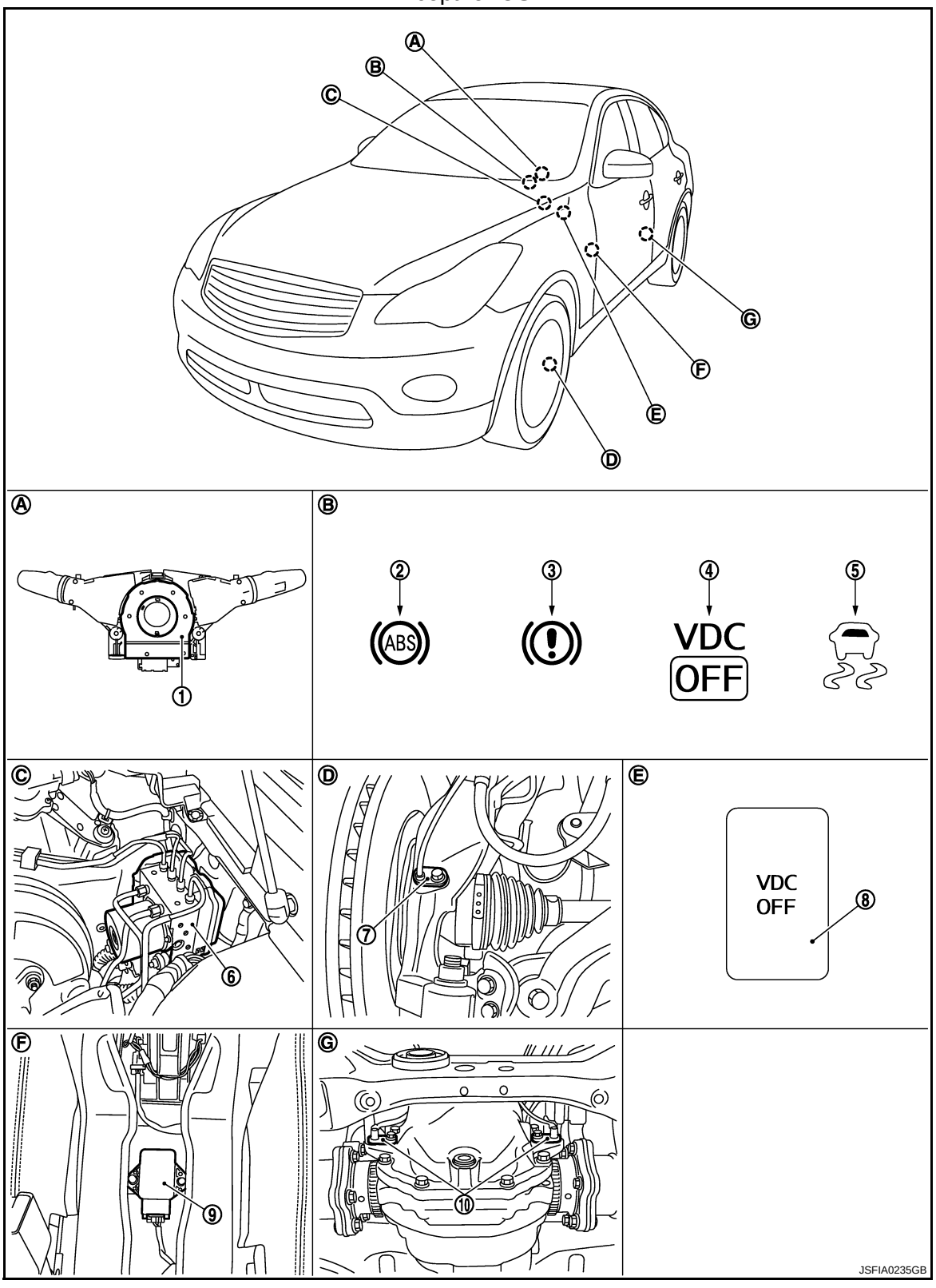


1. Steering angle sensor
2. ABS warning lamp
3. Brake warning lamp
4. VDC OFF indicator lamp
5. SLIP indicator lamp
6. ABS actuator and electric unit (control unit)

7. Front wheel sensor
8. VDC OFF switch
9. Yaw rate/side G sensor
10. Rear wheel sensor

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

Except for USA



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

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

Component Description

INFOID:0000000003430108

Component parts		Reference
ABS actuator and electric unit (control unit)	Pump	BRC-44, "Description"
	Motor	
	Actuator relay (main relay)	BRC-46, "Description"
	Solenoid valve	BRC-53, "Description"
	Pressure sensor	BRC-58, "Description"
	VDC switch-over valve (USV1, USV2, HSV1, HSV2)	BRC-66, "Description"
Wheel sensor		BRC-35, "Description"
Yaw rate/side G sensor		BRC-63, "Description"
Steering angle sensor		BRC-60, "Description"
VDC OFF switch		BRC-79, "Description"
ABS warning lamp		BRC-81, "Description"
Brake warning lamp		BRC-82, "Description"
VDC OFF indicator lamp		BRC-83, "Description"
SLIP indicator lamp		BRC-84, "Description"

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

CONSULT-III Function

INFOID:0000000003132875

FUNCTION

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

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

WORK SUPPORT

CAUTION:

Erase DTC memory of the lane camera unit after implementing work support. Refer to CCS-130, "CONSULT-III Function (LANE CAMERA)".

Item	Description
ST ANG SEN ADJUSTMENT	Adjusts the neutral position of the steering angle sensor.

SELF DIAGNOSTIC RESULT

Operation Procedure

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

Display Item List

Refer to BRC-95, "DTC No. Index".

How to Erase Self-diagnosis Results

After erasing DTC memory, 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 OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn OFF.

CAUTION:

If memory cannot be erased, perform applicable diagnosis.

NOTE:

- When the wheel sensor malfunctions, after inspecting the wheel sensor system, ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is 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

Display Item List

×: Applicable ▼: Optional item

Monitor item (Unit)	SELECT MONITOR ITEM		Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	
FR LH SENSOR [km/h (MPH)]	×	×	Wheel speed
FR RH SENSOR [km/h (MPH)]	×	×	
RR LH SENSOR [km/h (MPH)]	×	×	
RR RH SENSOR [km/h (MPH)]	×	×	
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal status
BATTERY VOLT (V)	×	×	Battery voltage supplied to the ABS actuator and electric unit (control unit)
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)	▼	×	Operation status of each solenoid valve
FR RH OUT SOL (On/Off) (Note 1)	▼	×	
FR LH IN SOL (On/Off) (Note 1)	▼	×	
FR LH OUT SOL (On/Off) (Note 1)	▼	×	
RR RH IN SOL (On/Off) (Note 1)	▼	×	
RR RH OUT SOL (On/Off) (Note 1)	▼	×	
RR LH IN SOL (On/Off) (Note 1)	▼	×	
RR LH OUT SOL (On/Off) (Note 1)	▼	×	
MOTOR RELAY (On/Off)	▼	×	Motor and motor relay operation

Monitor item (Unit)	SELECT MONITOR ITEM		Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	
ACTUATOR RLY (On/Off) (Note 1)	▼	×	Actuator relay operation
ABS WARN LAMP (On/Off)	▼	×	ABS warning lamp
OFF LAMP (On/Off)	▼	×	VDC OFF indicator lamp
SLIP LAMP (On/Off)	▼	×	SLIP indicator lamp
EBD SIGNAL (On/Off)	▼	▼	EBD operation
ABS SIGNAL (On/Off)	▼	▼	ABS operation
TCS SIGNAL (On/Off)	▼	▼	TCS operation
VDC SIGNAL (On/Off)	▼	▼	VDC operation
EBD FAIL SIG (On/Off)	▼	▼	EBD fail-safe signal
ABS FAIL SIG (On/Off)	▼	▼	ABS fail-safe signal
TCS FAIL SIG (On/Off)	▼	▼	TCS fail-safe signal
VDC FAIL SIG (On/Off)	▼	▼	VDC fail-safe signal
CRANKING SIG (On/Off)	▼	▼	Crank operation
USV[FR-RL] (On/Off) (Note 1)	▼	▼	VDC switch-over valve
USV[FL-RR] (On/Off) (Note 1)	▼	▼	
HSV[FR-RL] (On/Off) (Note 1)	▼	▼	
HSV[FL-RR] (On/Off) (Note 1)	▼	▼	
V/R OUTPUT (On/Off)	▼	▼	Solenoid valve relay activated
M/R OUTPUT (On/Off)	▼	▼	Actuator motor and motor relay activated
LDP) SHIFT POSITION (OFF/P/R/N/D/MM 1st – MM 6th) (Note 2)	×	×	Shift position received from TCM via CAN communication
LDP) ICC MAIN SW (On/Off) (Note 2)	×	×	ICC main switch status received from ECM via CAN communication
LDP) LDP ON SW (On/Off) (Note 2)	×	×	LDP ON switch status received from ECM via CAN communication
LDP) WIPER SIGNAL (Stop/PRTCT/1low/1high/Low/High) (Note 2)	×	×	Front wiper operating condition received from BCM via CAN communication
LDP) TURN SIGNAL (Off/LH/RH/LH&RH) (Note 2)	×	×	Turn signal operating condition received from BCM via CAN communication

Monitor item (Unit)	SELECT MONITOR ITEM		Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	
LDP) STOP LMP SW (On/Off) (Note 2)	×	×	Stop lamp switch signal status
LDP) BRAKE SW (On/Off) (Note 2)	×	×	Brake switch signal status
LDP) LDW SW (On/Off) (Note 2)	×	×	LDW switch status received from lane camera unit 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 OFF indicator lamp, SLIP indicator lamp and brake warning lamp are ON.**
- **ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp are ON during active test.**
- **Erase memory of ICC system after implementing active test. Refer to CCS-24, "CONSULT-III Function (ICC)".**
- **Erase memory of the lane camera unit after implementing active test. Refer to CCS-130, "CONSULT-III Function (LANE CAMERA)".**

NOTE:

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

Test Item

ABS SOLENOID VALVE

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

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

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

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

NOTE:

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

ABS SOLENOID VALVE (ACT)

- Touch “Up”, “ACT UP” and “ACT KEEP”. Then use screen monitor to check that solenoid valve operates as shown in the table below.

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

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

NOTE:

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

ABS MOTOR

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

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

NOTE:

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

ECU IDENTIFICATION

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

COMPONENT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

Description

INFOID:0000000003132876

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:0000000003132877

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

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

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

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

Diagnosis Procedure

INFOID:0000000003132878

CAUTION:
Do not check between wheel sensor terminals.

1.CHECK TIRES

Check air pressure, wear and size. Refer to WT-104, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace damaged parts.

2.CHECK SENSOR AND SENSOR ROTOR

- Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

3.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Disconnect malfunctioning wheel sensor connector.
4. Check terminal to see if it is deformed, disconnected, looseness, etc.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace damaged parts.

4. CHECK WHEEL SENSOR HARNESS

1. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal for power supply circuit

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

Measurement terminal for signal circuit

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

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

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

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace damaged parts.

5. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

1. Connect ABS actuator and electric unit (control unit) connector.
2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Check the voltage between wheel sensor harness connector and ground.

Wheel sensor		—	Voltage
Connector	Terminal		
E27 (Front RH)	1	Ground	8 V or more
E60 (Front LH)			
B33 (Rear RH)			
B34 (Rear LH)			

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace damaged parts.

6. CHECK DATA MONITOR

1. Turn the ignition switch OFF.
2. Connect each wheel sensor connector.

3. Check wheel sensor signal. Refer to BRC-37, "Component Inspection".

Is the inspection result normal?

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

Component Inspection

INFOID:0000000003132879

1.CHECK DATA MONITOR

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

Wheel sensor	Condition	Vehicle speed (DATA MONITOR)
FR LH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)
FR RH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)
RR LH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)
RR RH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)

NOTE:

Confirm tire pressure is normal.

Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000003132880

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1105, C1106, C1107, C1108 WHEEL SENSOR

Description

INFOID:0000000003430121

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:0000000003132882

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

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

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

YES >> Proceed to diagnosis. Refer to BRC-38, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003430122

CAUTION:
Do not check between wheel sensor terminals.

1.CHECK TIRES

Check air pressure, wear and size. Refer to WT-104, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace damaged parts.

2.CHECK SENSOR AND SENSOR ROTOR

- Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

3.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Disconnect malfunctioning wheel sensor connector.

4. Check terminal to see if it is deformed, disconnected, looseness, etc.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace damaged parts.

4. CHECK WHEEL SENSOR HARNESS

1. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal for power supply circuit

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

Measurement terminal for signal circuit

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

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

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

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace damaged parts.

5. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

1. Connect ABS actuator and electric unit (control unit) connector.
2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Check the voltage between wheel sensor harness connector and ground.

Wheel sensor		—	Voltage
Connector	Terminal		
E27 (Front RH)	1	Ground	8 V or more
E60 (Front LH)			
B33 (Rear RH)			
B34 (Rear LH)			

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace damaged parts.

6.CHECK DATA MONITOR

1. Turn the ignition switch OFF.
2. Connect each wheel sensor connector.
3. Check wheel sensor signal. Refer to BRC-37, "Component Inspection".

Is the inspection result normal?

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

Component Inspection

INFOID:0000000003430123

1.CHECK DATA MONITOR

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

Wheel sensor	Condition	Vehicle speed (DATA MONITOR)
FR LH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)
FR RH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)
RR LH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)
RR RH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)

NOTE:

Confirm tire pressure is normal.

Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000003430124

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1109 POWER AND GROUND SYSTEM

Description

INFOID:0000000003132886

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

DTC Logic

INFOID:0000000003132887

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch OFF to ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “C1109” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-41, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003132888

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 damaged parts.

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

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

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

2. Check 30A fusible link (L).
3. Check the continuity between ABS actuator and electric unit (control unit) harness connector and battery positive terminal.

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E41	3	Battery positive terminal	Existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts. (Check ABS earth bolt for tightness and corrosion.)

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.

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

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).
NO >> Repair or replace damaged parts. (Check ABS earth bolt for tightness and corrosion.)

Special Repair Requirement

INFOID:0000000003430135

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

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

DTC Logic

INFOID:0000000003132890

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

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

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

Diagnosis Procedure

INFOID:0000000003132891

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

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

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

Special Repair Requirement

INFOID:0000000003430136

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description

INFOID:0000000003132893

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:0000000003132894

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “C1111” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-44, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003132895

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 damaged 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 electric unit (control unit)		—	Voltage
Connector	Terminal		
E41	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

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.

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

Is the inspection result normal?

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

Component Inspection

INFOID:0000000003132896

1.CHECK ACTIVE TEST

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

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

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to diagnosis procedure. Refer to BRC-44, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003430137

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1114 ACTUATOR RELAY SYSTEM

Description

INFOID:0000000003132898

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

DTC Logic

INFOID:0000000003132899

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1114	MAIN RELAY	During the actuator relay operating with OFF, when the actuator relay turns ON, or when the control line for the relay is shorted to the ground.	• Harness or connector • ABS actuator and electric unit (control unit)
		During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open.	

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “C1114” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-46, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003132900

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 damaged 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 electric unit (control unit)		—	Voltage
Connector	Terminal		
E41	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

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 electric unit (control unit)		—	Continuity
Connector	Terminal		
E41	1	Ground	Existed
	4		

Is the inspection result normal?

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

Component Inspection

INFOID:0000000003430134

1.CHECK ACTIVE TEST

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

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

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to diagnosis procedure. Refer to BRC-46, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003430138

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1115 WHEEL SENSOR

Description

INFOID:0000000003430125

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:0000000003132904

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

Is DTC “C1115” detected?

YES >> Proceed to diagnosis. Refer to BRC-48, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003430126

CAUTION:
Do not check between wheel sensor terminals.

1.CHECK TIRES

Check air pressure, wear and size. Refer to WT-104, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace damaged parts.

2.CHECK SENSOR AND SENSOR ROTOR

- Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair wheel sensor mount or replace sensor rotor. Then perform the self-diagnosis.

3.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Disconnect wheel sensor connector.
4. Check terminal to see if it is deformed, disconnected, looseness, etc.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace damaged parts.

4.CHECK WHEEL SENSOR HARNESS

1. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)

Measurement terminal for power supply circuit

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

Measurement terminal for signal circuit

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

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

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

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace damaged parts.

5. CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

1. Connect ABS actuator and electric unit (control unit) connector.
2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Check the voltage between wheel sensor harness connector and ground.

Wheel sensor		—	Voltage
Connector	Terminal		
E27 (Front RH)	1	Ground	8 V or more
E60 (Front LH)			
B33 (Rear RH)			
B34 (Rear LH)			

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace damaged parts.

6. CHECK DATA MONITOR

1. Turn the ignition switch OFF.
2. Connect each wheel sensor connector.
3. Check wheel sensor signal. Refer to BRC-50, "Component Inspection".

Is the inspection result normal?

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

Component Inspection

INFOID:0000000003430127

1.CHECK DATA MONITOR

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

Wheel sensor	Condition	Vehicle speed (DATA MONITOR)
FR LH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)
FR RH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)
RR LH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)
RR RH SENSOR	Vehicle stopped	0 [km/h (MPH)]
	Vehicle running (Note)	Nearly matches the speedometer display (± 10% or less)

NOTE:

Confirm tire pressure is normal.

Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000003430128

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1116 STOP LAMP SWITCH

Description

INFOID:0000000003132908

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

DTC Logic

INFOID:0000000003132909

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “C1116” detected?

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

Diagnosis Procedure

INFOID:0000000003132910

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Disconnect stop lamp switch connector.
4. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace damaged parts.

2.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to BRC-51, "Component Inspection".

Is the inspection result normal?

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

3.CHECK STOP LAMP SWITCH CIRCUIT

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		
E41	30	Brake pedal is depressed	Battery voltage
		Brake pedal is released	Approx. 0 V

Is the inspection result normal?

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

Component Inspection

INFOID:0000000003132911

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 Terminal	Condition	Continuity
1 – 2 (With ICC models) 3 – 4 (Without ICC models)	Release stop lamp switch (When brake pedal is depressed.)	Existed
	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 BR-18, "Exploded View".

Special Repair Requirement

INFOID:0000000003430139

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1120, C1122, C1124, C1126 IN ABS SOL

Description

INFOID:0000000003132913

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:0000000003132914

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

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

YES >> Proceed to diagnosis procedure. Refer to BRC-53, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003132915

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 damaged 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 electric unit (control unit)		—	Voltage
Connector	Terminal		
E41	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

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 electric unit (control unit)		—	Continuity
Connector	Terminal		
E41	1	Ground	Existed
	4		

Is the inspection result normal?

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

Component Inspection

INFOID:0000000003132916

1.CHECK ACTIVE TEST

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

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

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

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to diagnosis procedure. Refer to BRC-53, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003430141

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

INFOID:0000000003430130

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:0000000003132919

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

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

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

Diagnosis Procedure

INFOID:0000000003430131

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 damaged 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 electric unit (control unit)		—	Voltage
Connector	Terminal		
E41	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

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 electric unit (control unit)		—	Continuity
Connector	Terminal		
E41	1	Ground	Existed
	4		

Is the inspection result normal?

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

Component Inspection

INFOID:0000000003430132

1.CHECK ACTIVE TEST

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

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

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

NOTE:

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

Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000003430140

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1130 ENGINE SIGNAL

Description

INFOID:0000000003132923

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

DTC Logic

INFOID:0000000003132924

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

Is DTC “C1130” detected?

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

Diagnosis Procedure

INFOID:0000000003132925

1.ECM SELF-DIAGNOSIS

Perform ECM self-diagnosis.

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

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 damaged parts.

Special Repair Requirement

INFOID:0000000003430142

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1142 PRESS SENSOR

Description

INFOID:0000000003132931

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

DTC Logic

INFOID:0000000003132932

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “C1142” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-58, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003132933

1.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to BRC-51, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunction component.

2.CHECK DATA MONITOR

Check pressure sensor signal. Refer to BRC-58, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> • Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc.
- Brake pedal: Refer to BR-7, "Inspection and Adjustment".
- Brake booster: Refer to BR-13, "Inspection".
- Master cylinder: Refer to BR-12, "Inspection".

3.ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

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

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 are damaged, repair or replace damaged parts.

Component Inspection

INFOID:0000000003132934

1.CHECK DATA MONITOR

On “DATA MONITOR”, select “PRESS SENSOR” and check the brake fluid pressure.

Condition	PRESS SENSOR (DATA MONITOR)
With ignition switch turned ON and brake pedal released.	Approx. 0 bar
With ignition switch turned ON and brake pedal depressed.	– 40 to 300 bar

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to diagnosis procedure. Refer to BRC-58, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003430144

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1143 STEERING ANGLE SENSOR

Description

INFOID:0000000003132936

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:0000000003132937

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “C1143” detected?

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

Diagnosis Procedure

INFOID:0000000003132938

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Disconnect steering angle sensor connector.
4. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace damaged parts.

2.CHECK STEERING ANGLE SENSOR HARNESS

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

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

3. Turn the ignition switch OFF.
4. Check the continuity between steering angle sensor harness connector and ground.

Steering angle sensor		—	Continuity
Connector	Terminal		
M37	7	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

3.CHECK DATA MONITOR

1. Connect steering angle sensor connector and ABS actuator and electric unit (control unit) connector.
2. Check steering angle sensor signal. Refer to BRC-61, "Component Inspection".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).
NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor.

Component Inspection

INFOID:0000000003132939

1.CHECK DATA MONITOR

Select “STR ANGLE SIG” in “DATA MONITOR” and check steering angle sensor signal.

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

Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000003132940

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

>> END

C1144 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000003441412

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 CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Select “ST ANG SEN ADJUSTMENT” in “WORK SUPPORT”, and perform adjust the neutral position of steering angle sensor.
3. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “C1144” detected?

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

Diagnosis Procedure

INFOID:0000000003441413

1. CHECK STEERING ANGLE SENSOR

Check steering angle sensor. Refer to BRC-60, "Diagnosis Procedure".

Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000003441415

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

>> END

C1145, C1146 YAW RATE/SIDE G SENSOR

Description

INFOID:0000000003132941

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:0000000003132942

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

Is DTC “C1145” or “C1146” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-63, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003132943

CAUTION:

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

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 damaged parts.

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

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

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

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

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

3.CHECK YAW RATE/SIDE G SENSOR GROUND CIRCUIT

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

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

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace damaged parts.

4.CHECK YAW RATE/SIDE G SENSOR HARNESS

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

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

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace damaged parts. Refer to BRC-105, "Precautions for Harness Repair".

5.CHECK DATA MONITOR

1. Connect yaw rate/side G sensor connector and ABS actuator and electric unit (control unit) connector.
2. Check yaw rate/side G sensor signal. Refer to BRC-64, "Component Inspection".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit).
NO >> Replace yaw rate/side G sensor.

Component Inspection

INFOID:0000000003132944

1.CHECK DATA MONITOR

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

Yaw rate sensor

Vehicle condition	YAW RATE SEN (DATA MONITOR)
Vehicle stopped	Approx. 0 d/s
Vehicle turning right	Negative value
Vehicle turning left	Positive value

Side G sensor

Vehicle condition	SIDE G-SENSOR (DATA MONITOR)
Vehicle stopped	Approx. 0 m/s^2
Vehicle turning right	Negative value
Vehicle turning left	Positive value

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to diagnosis procedure. Refer to BRC-63, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003430145

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1147, C1148, C1149, C1150 USV/HSV LINE

Description

INFOID:0000000003132946

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:0000000003132947

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

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

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

Diagnosis Procedure

INFOID:0000000003132948

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 damaged 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 electric unit (control unit)		—	Voltage
Connector	Terminal		
E41	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

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 electric unit (control unit)		—	Continuity
Connector	Terminal		
E41	1	Ground	Existed
	4		

Is the inspection result normal?

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

Component Inspection

INFOID:0000000003132949

1.CHECK ACTIVE TEST

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

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

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

NOTE:

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

Is the inspection result normal?

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

Special Repair Requirement

INFOID:0000000003430146

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1154 PNP SWITCH

Description

INFOID:0000000003441473

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

DTC Logic

INFOID:0000000003441474

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “C1154” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-69, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003441475

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 >> Replace or repair damaged parts.

2.CHECK TCM

Perform TCM self-diagnosis.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace damaged parts.

Component Inspection

INFOID:0000000003441476

1.CHECK EACH SWITCH

Select “SLCT LVR POSI” in “DATA MONITOR” and check gear position signal.

Gear position	SLCT LVR POSI (DATA MONITOR)
P	P
R	R

Gear position	SLCT LVR POSI (DATA MONITOR)
N	N
D	D

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to diagnosis procedure. Refer to BRC-69, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003441477

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1155 BRAKE FLUID LEVEL SWITCH

Description

INFOID:0000000003132951

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:0000000003132952

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 CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “C1155” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-71, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003132953

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect brake fluid level switch connector.
3. Disconnect unified meter and A/C amp. connector.
4. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace damaged parts.

2.CHECK BRAKE FLUID LEVEL SWITCH

Check brake fluid level switch. Refer to BRC-72, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Brake fluid level switch is malfunction. Replace reservoir tank.

3.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

1. Check the continuity between brake fluid level switch harness connector and unified meter and A/C amp. harness connector.

Unified meter and A/C amp.		Brake fluid level switch		Continuity
Connector	Terminal	Connector	Terminal	
M67	57	E47	1	Existed

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

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

3. Check the continuity between unified meter and A/C amp. harness connector and ground.

Unified meter and A/C amp.		—	Continuity
Connector	Terminal		
M67	57	Ground	Not existed

Is the inspection result normal?

YES >> Replace unified meter and A/C amp.
NO >> Repair or replace damaged parts.

Component Inspection

INFOID:0000000003132954

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		
1 – 2	When brake fluid is full in the reservoir tank.	Not existed
	When brake fluid is empty in the reservoir tank.	Existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace reservoir tank. Refer to BR-25, "Exploded View".

Special Repair Requirement

INFOID:0000000003430147

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

C1185 ICC UNIT

Description

INFOID:0000000003132956

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

DTC Logic

INFOID:0000000003132957

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “C1185” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-73, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003132958

1.CHECK ICC SENSOR INTEGRATED UNIT CIRCUIT

Perform ICC sensor integrated unit self-diagnosis.

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace damaged parts.
NO >> GO TO 2.

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

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

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace damaged parts.
NO >> INSPECTION END

Special Repair Requirement

INFOID:0000000003430148

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000003132960

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:0000000003132961

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “U1000” detected?

YES >> Proceed to diagnosis procedure. Refer to BRC-74, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000003132962

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

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

Is DTC “U1000” detected?

YES >> Proceed to diagnosis procedure. Refer to LAN-18, "Trouble Diagnosis Flow Chart".
NO >> INSPECTION END

Special Repair Requirement

INFOID:0000000003430149

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

U1100 CAN COMM CIRCUIT (ICC UNIT)

Description

INFOID:0000000003441417

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

DTC Logic

INFOID:0000000003430151

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC “U1100” detected?

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

Diagnosis Procedure

INFOID:0000000003430152

1.CHECK CAN COMMUNICATION LINE

Check CAN communication line. Refer to BRC-74, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace damaged parts.

2.CHECK ICC INTEGRATED UNIT

Perform ICC integrated unit self-diagnosis.

Is the inspection result normal?

YES >> ABS actuator and electric unit (control unit).
NO >> Repair or replace damaged parts.

Special Repair Requirement

INFOID:0000000003441416

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform the neutral position adjustment for the steering angle sensor, when replacing the ABS actuator and electric unit (control unit). Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> END

POWER SUPPLY AND GROUND CIRCUIT

Description

INFOID:0000000003738692

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

Diagnosis Procedure

INFOID:0000000003738693

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

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

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

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

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform the trouble diagnosis for power supply circuit.

2.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 electric unit (control unit)		—	Voltage
Connector	Terminal		
E41	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Perform the trouble diagnosis for power supply circuit.

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

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace damaged parts.

PARKING BRAKE SWITCH

Component Function Check

INFOID:0000000003132965

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 operation.	OFF

Is the inspection result normal?

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

Diagnosis Procedure

INFOID:0000000003132966

1.CHECK PARKING BRAKE SWITCH

Check parking brake switch. Refer to BRC-77, "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 MWI-38, "Diagnosis Description".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace combination meter.

3.CHECK DATA MONITOR

On “DATA MONITOR”, select “PARK BRAKE SW” 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-40, "CONSULT-III Function (METER/M&A)".

Component Inspection

INFOID:0000000003132967

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	Continuity
Connector	Terminal			
E107	1	Ground	When the parking brake switch is operated.	Existed
			When the parking brake switch is not operated.	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace parking brake switch.

VDC OFF SWITCH

Description

INFOID:0000000003132968

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

Component Function Check

INFOID:0000000003132969

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?

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

Diagnosis Procedure

INFOID:0000000003132970

1.CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to BRC-80, "Component Inspection".

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 and electric unit (control 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 electric unit (control unit)		—	Continuity
Connector	Terminal		
E41	31	Ground	Not existed

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

VDC OFF switch		—	Continuity
Connector	Terminal		
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.

3.CHECK COMBINATION METER

1. Connect ABS actuator and electric unit (control unit) connector.
2. Connect VDC OFF switch connector.
3. Check the indication and operation of combination meter are normal. Refer to MWI-38, "Diagnosis Description".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace combination meter.

Component Inspection

INFOID:0000000003132971

1.CHECK VDC OFF SWITCH

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace VDC OFF switch.

ABS WARNING LAMP

Description

INFOID:0000000003132972

×: 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:0000000003132973

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 BRC-81, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003132974

1.CHECK SELF-DIAGNOSIS

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

Is the inspection result normal?

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

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-38, "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

Description

INFOID:0000000003132975

×: ON –: OFF

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.	×

NOTE:

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

Component Function Check

INFOID:0000000003132976

1. BRAKE WARNING 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 BRC-82, "Diagnosis Procedure".

2. BRAKE WARNING LAMP OPERATION CHECK 2

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check parking brake switch. Refer to BRC-77, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003132977

1. CHECK PARKING BRAKE SWITCH

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check parking brake switch. Refer to BRC-77, "Diagnosis Procedure".

2. CHECK SELF-DIAGNOSIS

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

Is the inspection result normal?

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

3. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-38, "Diagnosis Description".

Is the inspection result normal?

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

VDC OFF INDICATOR LAMP

Description

INFOID:0000000003132978

×: 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.)	×
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000003132979

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 BRC-83, "Diagnosis Procedure".

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check VDC OFF switch. Refer to BRC-79, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003132980

1.CHECK VDC OFF SWITCH

Perform the trouble diagnosis for VDC OFF switch. Refer to BRC-79, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check VDC OFF switch. Refer to BRC-79, "Diagnosis Procedure".

2.CHECK SELF-DIAGNOSIS

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

Is the inspection result normal?

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

3.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-38, "Diagnosis Description".

Is the inspection result normal?

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

SLIP INDICATOR LAMP

Description

INFOID:0000000003132981

×: ON △: Blink –: OFF

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

Component Function Check

INFOID:0000000003132982

1.CHECK SLIP INDICATOR LAMP OPERATION

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

Is the inspection result normal?

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

Diagnosis Procedure

INFOID:0000000003132983

1.CHECK SELF-DIAGNOSIS

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

Is the inspection result normal?

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

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-38, "Diagnosis Description".

Is the inspection result normal?

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

ECU DIAGNOSIS

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:0000000003132984

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
FR LH SENSOR	Wheel speed	Vehicle stopped	0 [km/h (MPH)]
		Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)
FR RH SENSOR	Wheel speed	Vehicle stopped	0 [km/h (MPH)]
		Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)
RR LH SENSOR	Wheel speed	Vehicle stopped	0 [km/h (MPH)]
		Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)
RR RH SENSOR	Wheel speed	Vehicle stopped	0 [km/h (MPH)]
		Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is depressed	On
		When brake pedal is not depressed	Off
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D
YAW RATE SEN	Yaw rate detected by yaw rate/side G sensor	Vehicle stopped	Approx. 0 d/s
		Vehicle turning right	Negative value
		Vehicle turning left	Positive value
ACCEL POS SIG	Throttle actuator opening/closing is displayed (linked with accelerator pedal)	Accelerator pedal not depressed (ignition switch is ON)	0 %
		Depress accelerator pedal (ignition switch is ON)	0 - 100 %
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle stopped	Approx. 0 m/s^2
		Vehicle turning right	Negative value
		Vehicle turning left	Positive value

Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
STR ANGLE SIG	Steering angle detected by steering angle sensor	Driving straight	±2.5°
		Turn 90° to right	Approx. +90°
		Turn 90° to left	Approx. –90°
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar
		With ignition switch turned ON and brake pedal depressed	–40 to 300 bar
ENGINE RPM	With engine running	With engine stopped	0 rpm
		Engine running	Almost in accordance with tachometer display
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch ON	On
		When brake fluid level switch OFF	Off
PARK BRAKE SW	Parking brake switch signal status	Parking brake switch is active	On
		Parking brake switch is inactive	Off
LDP) APP SEN (Note 4)	Accelerator pedal position sensor status	Accelerator pedal is not depressed (Ignition switch ON)	0 %
		Depress accelerator pedal (Ignition switch ON)	0 - 100 %
FR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT-III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT-III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT-III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
FR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT-III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT-III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
RR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active (“ACTIVE TEST” with CONSULT-III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off

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

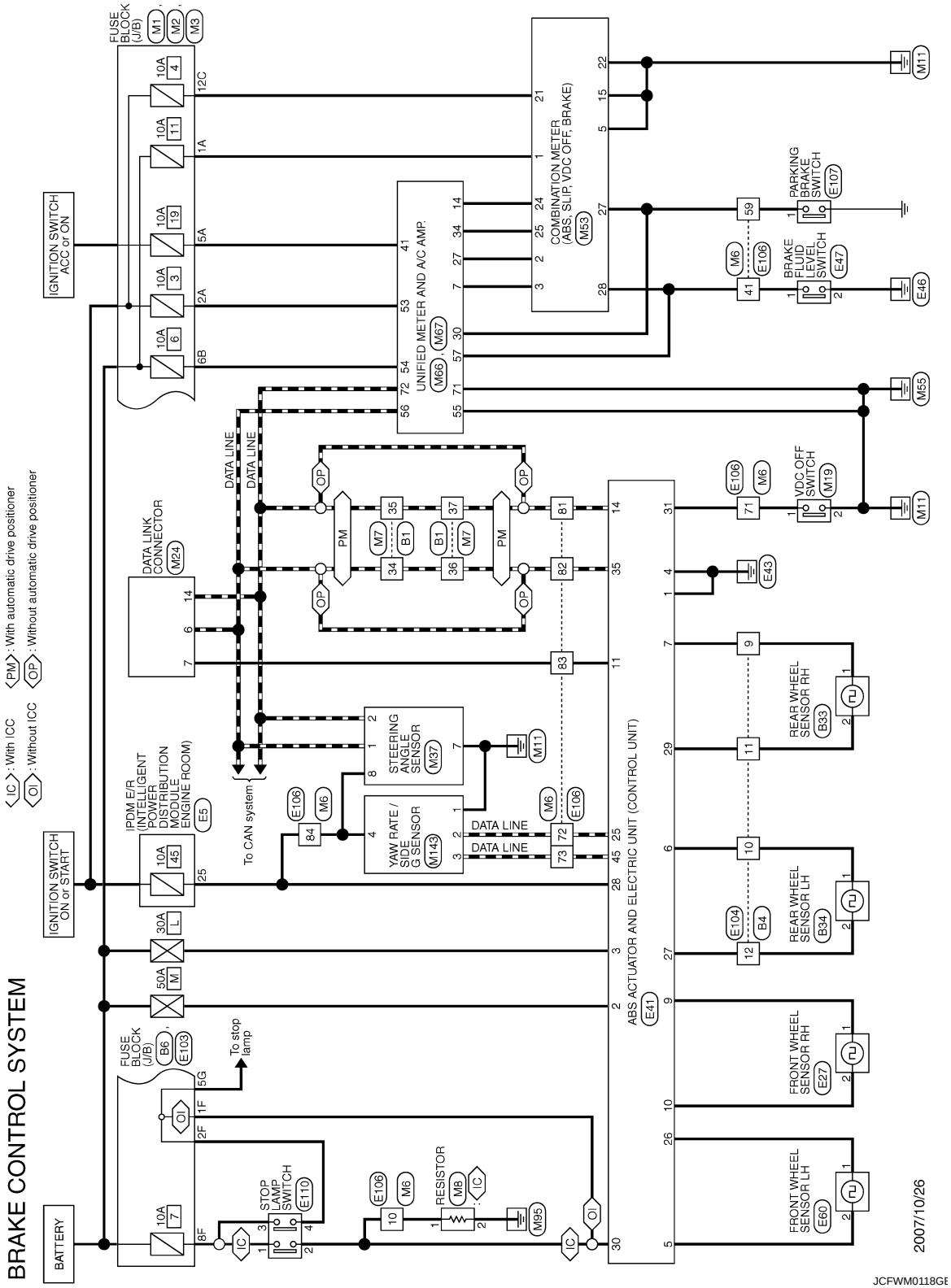
Monitor item	Display content	Data monitor	
		Condition	Reference value in normal operation
USV [FR-RL] (Note 2)	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT-III)	On
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	Off
HSV [FL-RR] (Note 2)	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT-III)	On
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	Off
HSV [FR-RL] (Note 2)	VDC switch-over valve	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT-III)	On
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	Off
V/R OUTPUT (Note 2)	Solenoid valve relay activated	When the solenoid valve relay is active (When ignition switch OFF)	On
		When the solenoid valve relay is not active (in the fail-safe mode)	Off
M/R OUTPUT	Actuator motor and motor relay activated	When the actuator motor and motor relay are active (“ACTIVE TEST” with CONSULT-III)	On
		When the actuator motor and motor relay are inactive	Off
LDP) SHIFT POSITION (Note 4)	Shift position	Shift position is not received	Off
		Selector lever position	P/R/N/D
		When using manual mode	MM 1st – MM 6th
LDP) ICC MAIN SW (Note 4)	ICC main switch	ICC main switch is ON	On
		ICC main switch is OFF	Off
LDP) LDP ON SW (Note 4)	LDP ON switch	LDP ON switch is ON	On
		LDP ON switch is OFF	Off
LDP) WIPER SIGNAL (Note 4)	Front wiper operation	Front wiper is OFF.	Stop
		Front wiper stops at fail-safe operation	PRTCT
		Front wiper INT is operating.	1low
		Front wiper LO is operating.	Low
		Front wiper HI is operating.	High
LDP) TURN SIGNAL (Note 4)	Turn signal operation	Turn signal is OFF.	Off
		Turn signal lamp RH is blinking.	LH
		Turn signal lamp LH is blinking.	RH
		Turn signal lamp LH and RH are blinking.	LH&RH
LDP) STOP LMP SW (Note 4)	Stop lamp switch signal status	When brake pedal is depressed	On
		When brake pedal is not depressed	Off
LDP) BRAKE SW (Note 4)	Brake switch signal status	When brake pedal is not depressed	On
		When brake pedal is depressed	Off
LDP) LDW SW (Note 4)	LDW switch condition	LDW switch is ON (LDW ON indicator is ON)	On
		LDW switch is OFF (LDW ON indicator is OFF)	Off

NOTE:

- 1: Confirm tire pressure is normal.
- 2: A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.
- 3: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-81, "Description".
- Brake warning lamp: Refer to BRC-82, "Description".
- VDC OFF indicator lamp: Refer to BRC-83, "Description".
- SLIP indicator lamp: Refer to BRC-84, "Description".
- Lane departure warning lamp: Refer to CCS-122, "System Description".
- 4: With LDP models.

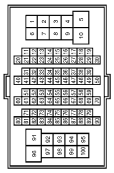
Wiring Diagram - BRAKE CONTROL SYSTEM -

INFOID:0000000003132985



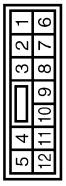
BRAKE CONTROL SYSTEM

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



Terminal No.	Color of Wire	Signal Name [Specification]
34	L	–
35	P	–
36	L	–
37	P	–

Connector No.	B4
Connector Name	WIRE TO WIRE
Connector Type	NS12FW-CS



Terminal No.	Color of Wire	Signal Name [Specification]
9	BR	–
10	O	–
11	LG	–
12	GR	–

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

Terminal No.	Color of Wire	Signal Name [Specification]
5G	LG	–

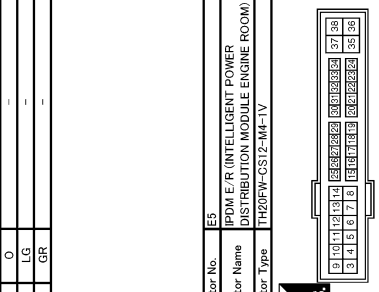
Connector No.	B33
Connector Name	REAR WHEEL SENSOR RH
Connector Type	AAZ02FB1

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

Connector No.	B34
Connector Name	REAR WHEEL SENSOR LH
Connector Type	AAZ02FB2

Terminal No.	Color of Wire	Signal Name [Specification]
1	O	–
2	GR	–

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



Terminal No.	Color of Wire	Signal Name [Specification]
25	G	–

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

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

JCFWM0119GE

BRAKE CONTROL SYSTEM

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	B	GND
2	G	UBMR
3	R	UBVR
4	B	GND
5	Y	DS FL
6	O	DP RL
7	BR	DP RR
9	B	DP FR
10	W	DS FR
11	V	DIAG-K
14	P	CAN-L

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1F	SB	-
2F	W	-
8F	L	-

25	Y	BUS-L
26	LG	DP FL
27	GR	DS RL
28	G	UZ
29	LG	DS RR
30	SB	BLS
31	R	VDC OFF SW
35	L	CAN-H
45	B	BUS-H

Connector No.	E104
Connector Name	WIRE TO WIRE
Connector Type	NS12MW-CS

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
9	BR	-
10	O	-
11	LG	-
12	GR	-

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

H.S.

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

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

H.S.

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

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
10	SB	-
41	W	-
59	O	-
71	R	-
72	Y	-
73	B	-
81	P	-
82	L	-
83	V	-
84	G	-

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	O	-

JCFWM0120GB

BRAKE CONTROL SYSTEM

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	L	–
2	SB	–
3	L	–
4	W	–

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1A	GR	–
2A	G	–
5A	V	–

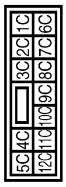
Connector No.	M2
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FW-CS

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
6B	Y	–

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

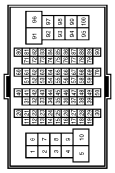
H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
12C	O	–

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

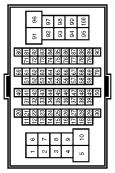
H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
10	L	–
41	W	–
59	V	–
71	LG	–
72	Y	–
73	SB	–
81	P	–
82	L	–
83	R	–
84	G	–

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

H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
34	L	–
35	P	–
36	L	–
37	P	–

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	L	–
2	B	–

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

H.S.

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

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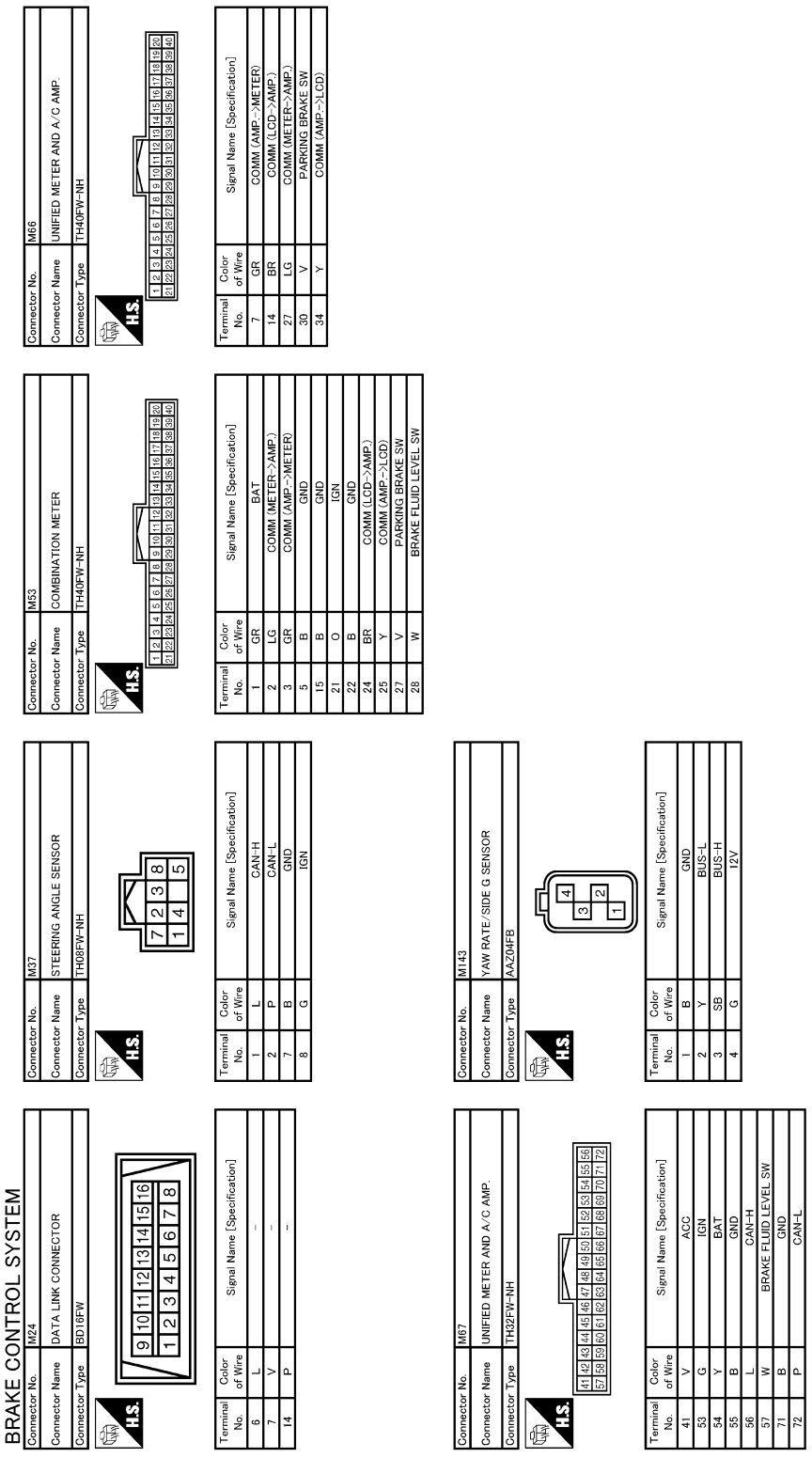


JCFWM0122GE

Fail-Safe

INFOID:0000000003132986

ABS, EBD SYSTEM

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

- For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without 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 OFF indicator lamp, SLIP indicator lamp are turned on, and the condition of vehicle is the same as the condition of vehicles without VDC/TCS control.

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

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

INFOID:0000000003132987

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	BRC-35, "DTC Logic"
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	BRC-38, "DTC Logic"
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-41, "DTC Logic"
C1110	CONTROLLER FAILURE	BRC-43, "DTC Logic"
C1111	PUMP MOTOR	BRC-44, "DTC Logic"
C1114	MAIN RELAY	BRC-46, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-48, "DTC Logic"
C1116	STOP LAMP SW	BRC-51, "DTC Logic"
C1120	FR LH IN ABS SOL	BRC-53, "DTC Logic"
C1121	FR LH OUT ABS SOL	BRC-55, "DTC Logic"
C1122	FR RH IN ABS SOL	BRC-53, "DTC Logic"
C1123	FR RH OUT ABS SOL	BRC-55, "DTC Logic"
C1124	RR LH IN ABS SOL	BRC-53, "DTC Logic"
C1125	RR LH OUT ABS SOL	BRC-55, "DTC Logic"
C1126	RR RH IN ABS SOL	BRC-53, "DTC Logic"
C1127	RR RH OUT ABS SOL	BRC-55, "DTC Logic"
C1130	ENGINE SIGNAL 1	BRC-57, "DTC Logic"
C1142	PRESS SEN CIRCUIT	BRC-58, "DTC Logic"
C1143	ST ANG SEN CIRCUIT	BRC-60, "DTC Logic"
C1144	ST ANG SEN SIGNAL	BRC-62, "DTC Logic"
C1145	YAW RATE SENSOR	BRC-63, "DTC Logic"
C1146	SIDE G-SEN CIRCUIT	

DTC	Items (CONSULT screen terms)	Reference
C1147	USV LINE [FL-RR]	BRC-66, "DTC Logic"
C1148	USV LINE [FR-RL]	
C1149	HSV LINE [FL-RR]	
C1150	HSV LINE [FR-RL]	
C1153	EMERGENCY BRAKE	BRC-43, "DTC Logic"
C1154	PNP POSI SIG	BRC-69, "DTC Logic"
C1155	BR FLUID LEVEL LOW	BRC-71, "DTC Logic"
C1170	VARIANT CORDING	BRC-43, "DTC Logic"
C1185	ACC CONT	BRC-73, "DTC Logic"
C1B00	LDP) CAMERA MALF	CCS-149, "DTC Logic"
C1B04	LDP) ICC STG SW MALF	CCS-150, "DTC Logic"
C1B05	LDP) APP SEN MALF	CCS-151, "DTC Logic"
C1B06	LDP) TCM MALF	CCS-152, "DTC Logic"
U0100	LDP) ECM CAN CIR2	CCS-153, "DTC Logic"
U0101	LDP) TCM CAM CAN CIR2	CCS-154, "DTC Logic"
U0104	LDP) ICC CAM CAN CIR2	CCS-155, "DTC Logic"
U0405	LDP) ICC CAM CAN CIR1	CCS-156, "DTC Logic"
U1000	CAN COMM CIRCUIT	BRC-74, "DTC Logic"
U1002	SYSTEM COMM (CAN)	
U1100	ACC COMM CIRCUIT	BRC-75, "DTC Logic"
U1500	LDP) CAM CAN CIR1	CCS-157, "DTC Logic"
U1501	LDP) CAM CAN CIR2	CCS-158, "DTC Logic"

SYMPTOM DIAGNOSIS

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:0000000003132989

1.CHECK START

Check front and rear brake force distribution using a brake tester. Refer to BR-46, "General Specifications".

Is the inspection result normal?

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

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles.

- Front
  - 2WD models: Refer to FAX-5, "Inspection".
  - AWD models: Refer to FAX-14, "Inspection".
- Rear: Refer to RAX-5, "Inspection".

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.
NO >> Normal

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

INFOID:0000000003132990

1.CHECK BRAKE PEDAL STROKE

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 BR-11, "Bleeding Brake System".
• Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc.
- Brake pedal: Refer to BR-7, "Inspection and Adjustment".
- Brake booster: Refer to BR-13, "Inspection".
- Master cylinder: Refer to BR-12, "Inspection".

NO >> GO TO 2.

2.CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal
NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000003132991

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

Diagnosis Procedure

INFOID:0000000003132992

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

1. CHECK ABS WARNING LAMP DISPLAY

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

Is the inspection result normal?

YES >> Normal
NO >> Perform self-diagnosis.

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:0000000003132993

CAUTION:

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

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

1. SYMPTOM CHECK 1

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

Do vibrations occur?

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

2. SYMPTOM CHECK 2

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

Do the operation noises occur?

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

3. SYMPTOM CHECK 3

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

Do symptoms occur?

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

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000003132994

1.SYMPTOM CHECK

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

Is the inspection result normal?

YES >> Normal.
NO >> GO TO 2.

2.CHECK SELF-DIAGNOSIS RESULTS

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

Are self-diagnosis results indicated?

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

3.CHECK CONNECTOR

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

Are self-diagnosis results indicated?

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

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

Perform ECM self-diagnosis and TCM self-diagnosis.

Are self-diagnosis results indicated?

YES >> Check the corresponding items.
NO >> Replace ABS actuator and electric unit (control unit).

NORMAL OPERATING CONDITION

Description

INFOID:0000000003132995

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

PRECAUTION

PRECAUTIONS

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

INFOID:0000000003132996

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 AIRBAG” and “SEAT BELT” of this Service Manual.

WARNING:

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

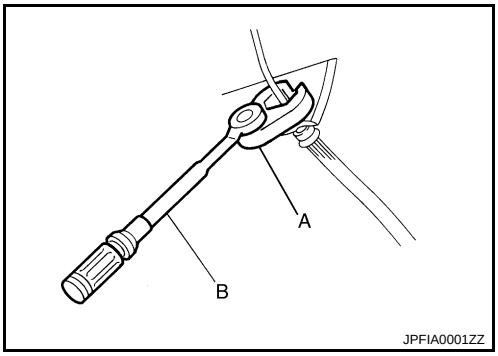
Precaution for Brake System

INFOID:0000000003132997

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 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.



JPFIA0001ZZ

Precaution for Brake Control

INFOID:0000000003132998

- 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.

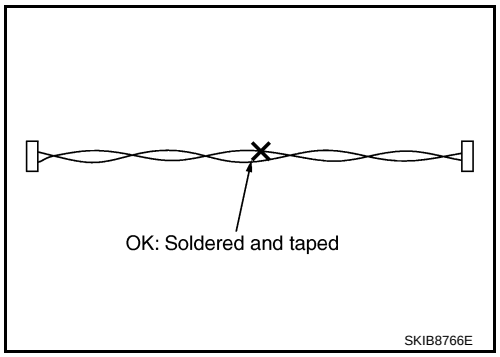
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or SLIP indicator lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspension related parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).
- When driving with worn or deteriorated suspension, tires and brake-related parts.

Precautions for Harness Repair

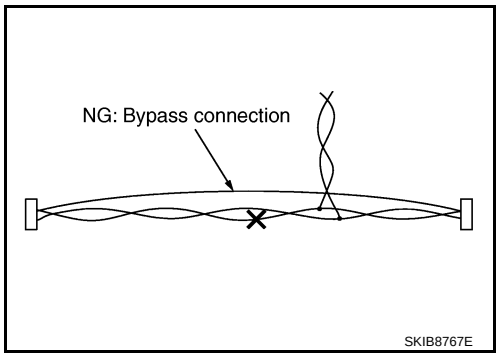
INFOID:0000000003733509

COMMUNICATION LINE

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



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



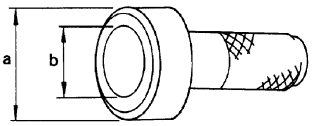
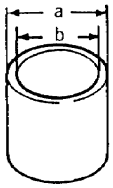
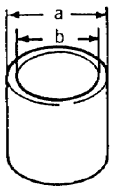
PREPARATION

PREPARATION

Special Service Tool

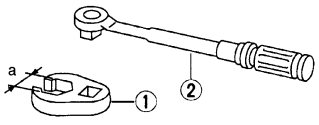
INFOID:0000000003132999

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
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.  ZZA0701D	Installing rear sensor rotor
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.  ZZA0832D	
KV40104710 (—) a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.  ZZA0832D	

Commercial Service Tool

INFOID:0000000003133000

Tool name	Description
1. Flare nut crowfoot a: 10 mm (0.39 in) /12 mm (0.47 in) 2. Torque wrench  S-NT360	Installing brake tube

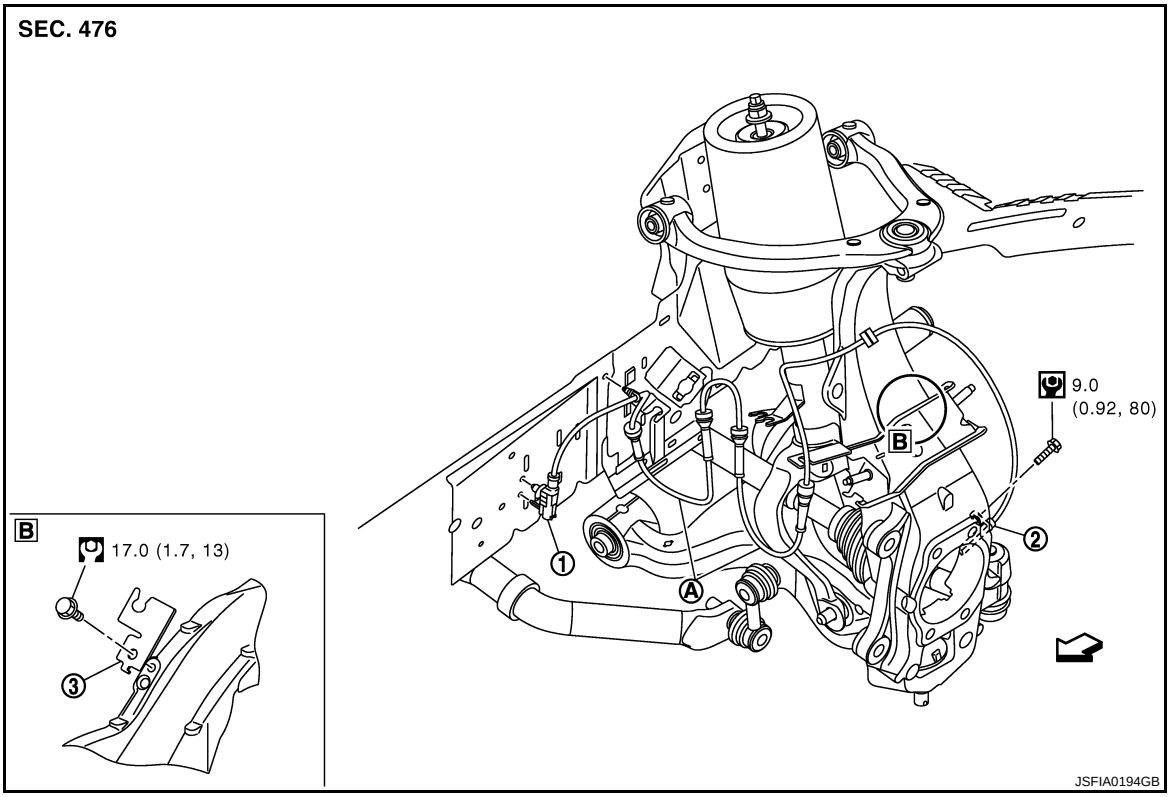
ON-VEHICLE REPAIR

WHEEL SENSOR

FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:0000000003133001



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

A. White line (slant line)

⇦: 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:0000000003133002

REMOVAL

Be careful with the following when removing sensor.

CAUTION:

- **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 BRC-107, "FRONT WHEEL SENSOR : Exploded View".

CAUTION:

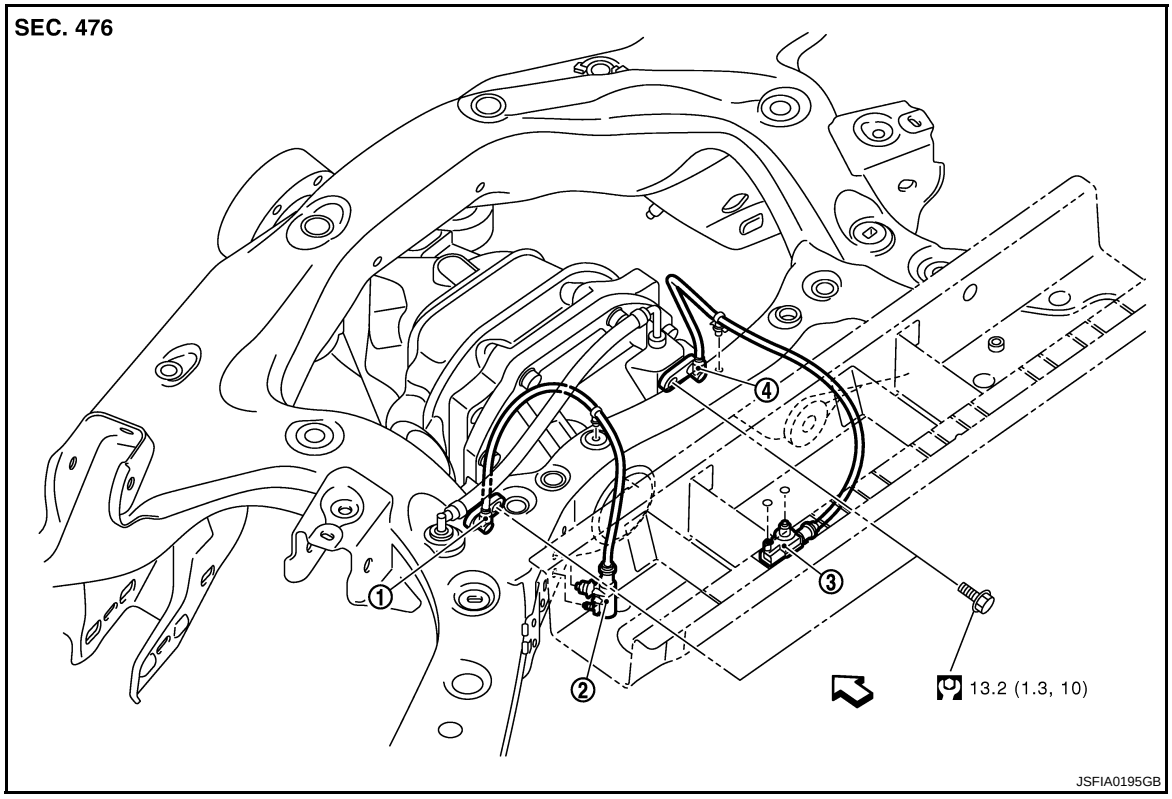
- **When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.**

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

REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:0000000003291967



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

⇦: Vehicle front

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

REAR WHEEL SENSOR : Removal and Installation

INFOID:0000000003291968

REMOVAL

Be careful with the following when removing sensor.

CAUTION:

- **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 BRC-108, "REAR WHEEL SENSOR : Exploded View".

CAUTION:

- **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.**

SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR : Exploded View

INFOID:0000000003133003

Refer to FAX-6, "Exploded View" (2WD models), FAX-16, "Exploded View" (AWD models).

FRONT SENSOR ROTOR : Removal and Installation

INFOID:0000000003133004

REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to FAX-6, "Exploded View" (2WD models), FAX-16, "Exploded View" (AWD models).

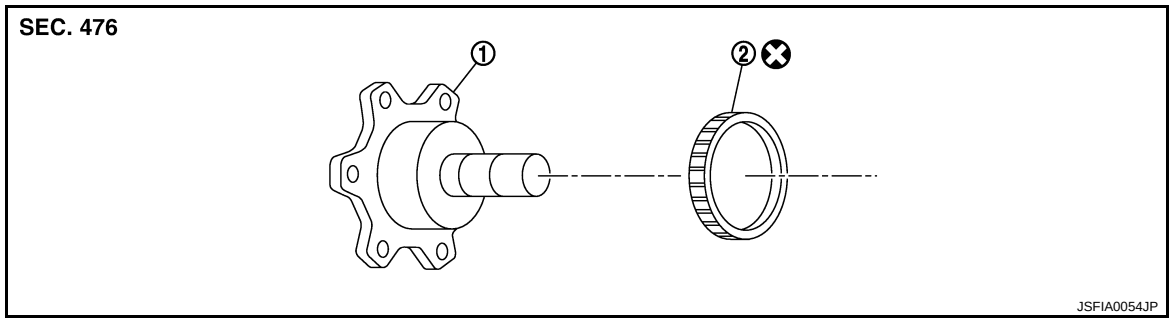
INSTALLATION

Sensor rotor cannot be disassembled. Install the sensor rotor together with hub bearing assembly. Refer to FAX-6, "Exploded View" (2WD models), FAX-16, "Exploded View" (AWD models).

REAR SENSOR ROTOR

REAR SENSOR ROTOR : Exploded View

INFOID:0000000003133005



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

INFOID:0000000003133006

REMOVAL

- Follow the procedure below to remove rear sensor rotor.
- Remove side flange. Refer to RAX-9, "Exploded View".
- Using a bearing replacer (suitable tool) and puller (suitable tool), remove sensor rotor from side flange.

INSTALLATION

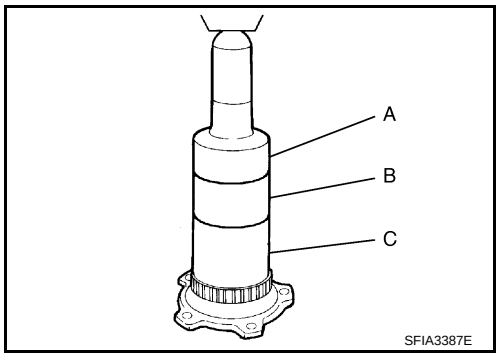
CAUTION:

Do not reuse sensor rotor.

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

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

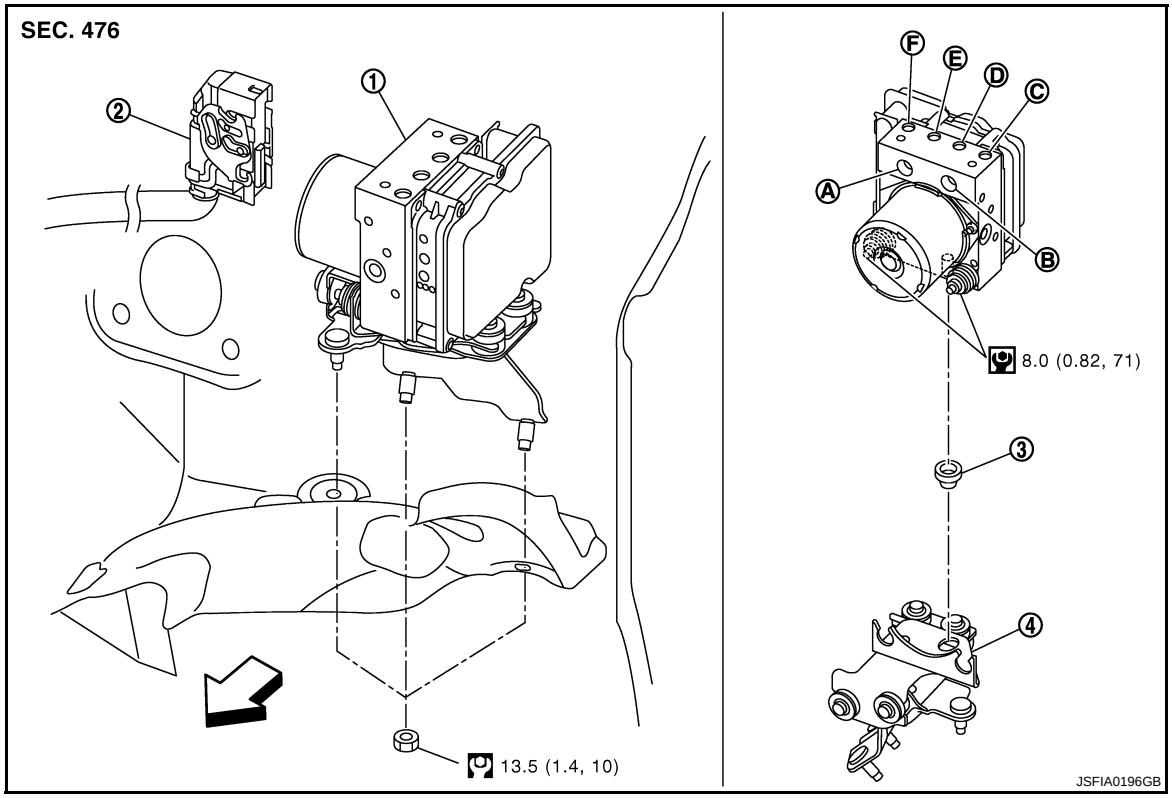
- Install side flange. Refer to RAX-9, "Exploded View".



ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

INFOID:0000000003133007



1.	ABS actuator and electric unit (control unit)	2.	Connector	3.	Bushing
4.	Bracket				
A.	From master cylinder secondary side	B.	From master cylinder primary side	C.	To front LH brake caliper
D.	To rear RH brake caliper	E.	To Rear LH brake caliper	F.	To front RH brake caliper

⇦: Vehicle front

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

Removal and Installation

INFOID:0000000003133008

REMOVAL

CAUTION:

- **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 BR-11, "Bleeding Brake System".**

1. Remove hoodledge cover (LH). Refer to EXT-22, "Exploded View".
2. Disconnect ABS actuator and electric unit (control unit) connector.
3. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit).
4. Remove tire (front LH side).
5. Remove fender protector (rear): (front LH side). Refer to EXT-25, "FENDER PROTECTOR : Exploded View".
6. Remove ABS actuator and electric unit (control unit) bracket mounting nuts.
7. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

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

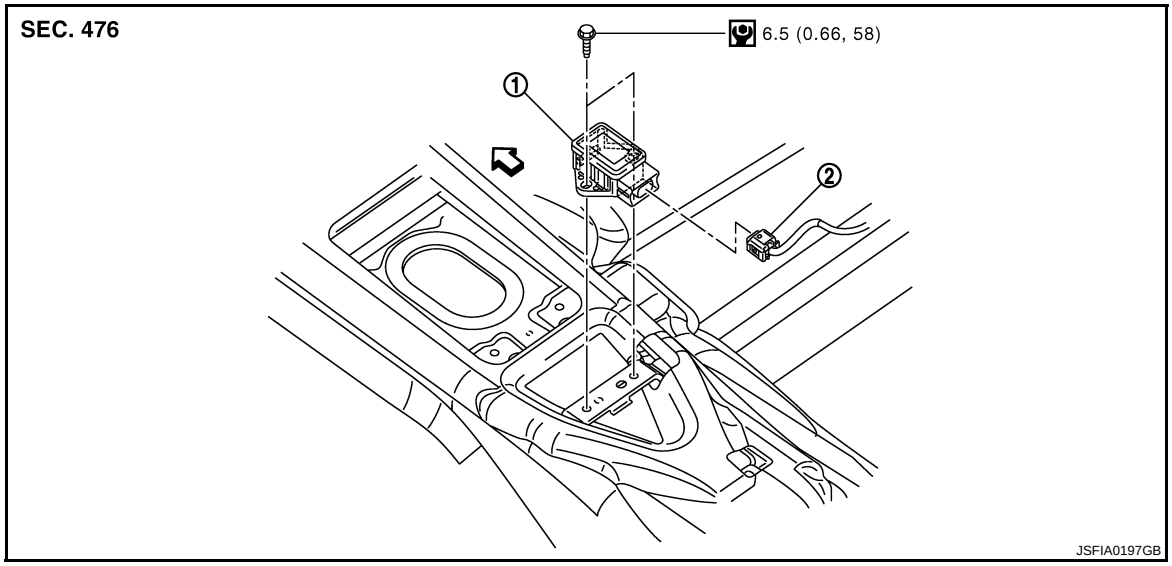
CAUTION:

- **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 BR-11, "Bleeding Brake System".**
- **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 BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".**

YAW RATE/SIDE G SENSOR

Exploded View

INFOID:0000000003133009



1. Yaw rate/side G sensor
2. Connector

⇦: Vehicle front

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

Removal and Installation

INFOID:0000000003133010

REMOVAL

CAUTION:

Do not drop or strike yaw rate/side G sensor, or do not use power tool etc., because yaw rate/side G sensor is sensitive to the impact.

1. Remove center console. Refer to IP-22, "Exploded View".
2. Disconnect yaw rate/side G sensor harness connector.
3. Remove mounting bolts. Remove yaw rate/side G sensor.

INSTALLATION

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

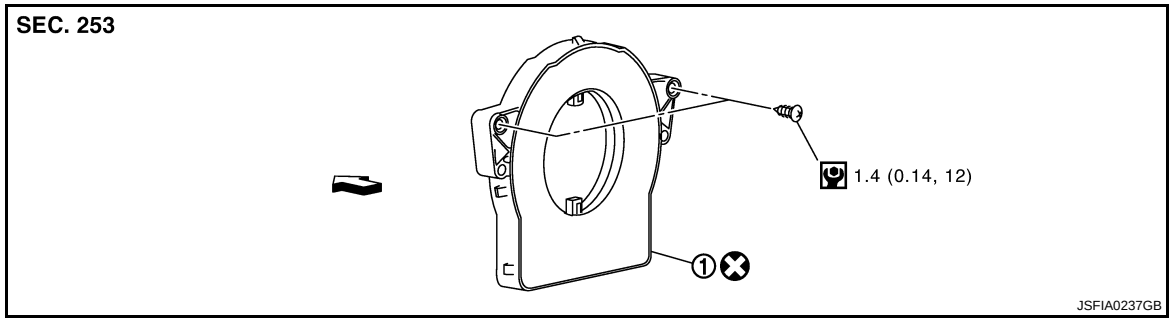
CAUTION:

Do not drop or strike yaw rate/side G sensor, or do not use power tool etc., because yaw rate/side G sensor is sensitive to the impact.

STEERING ANGLE SENSOR

Exploded View

INFOID:0000000003133011



1. Steering angle sensor

⇦: Vehicle front

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

Removal and Installation

INFOID:0000000003133012

REMOVAL

1. Remove spiral cable assembly. Refer to SR-6, "Exploded View".
2. Remove steering angle sensor from spiral cable assembly.

INSTALLATION

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

CAUTION:

- **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 BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".**