SECTION BRAKE CONTROL SYSTEM

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BASIC INSPECTION DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

PRECAUTIONS FOR DIAGNOSIS

Adjustment of Steering Angle Sensor

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to <u>BRC-9</u>, <u>"ADJUSTMENT OF STEERING ANGLE</u> <u>SENSOR NEUTRAL POSITION : Description</u>".

Calibration of Yaw Rate/Side/Decel G Sensor

If yaw rate/side/decel G sensor or ABS actuator and electric unit (control unit) have been replaced, be sure to calibrate yaw rate/side/decel G sensor before driving. Refer to <u>BRC-10</u>, <u>"CALIBRATION OF YAW RATE/SIDE/</u><u>DECEL G SENSOR : Description"</u>.

Calibration of Pressure Sensor

If ABS actuator and electric unit (control unit) have been replaced, be sure to calibrate pressure sensor before driving. Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u>.

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[VDC/TCS/ABS]

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

OVERALL SEQUENCE



DETAILED FLOW

1.COLLECT THE INFORMATION FROM THE CUSTOMER

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

>> GO TO 2.

DIAGNOSIS AND REPAIR WORK FLOW

IVDC/TCS/ABS1

< BASIC INSPECTION >	[VDC/TCS/ABS]
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-102 "DTC No	o Index"
$\frac{1}{2}$	
>> GO TO 7.	
${f 4}.$ CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCT	ION
Check that the symptom is a normal operation that is not considered a system malfu	unction. Refer to <u>BRC-110,</u>
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 <u>BRC-84, "Description"</u> .	
 Brake warning lamp: Refer to <u>BRC-85, "Description"</u>. VDC OFF indicator lamp: Refer to BRC-86, "Description". 	
 SLIP indicator lamp: Refer to <u>BRC-87, "Description"</u>. 	
Is ON/OFF timing normal?	
YES >> GO TO 6. NO >> GO TO 2	
$6_{\rm PERFORM}$ 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 comple	etely.
Is no other DTC present and the repair completed?	
YES >> INSPECTION END	

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

Diagnostic Work Sheet

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[VDC/TCS/ABS]

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

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< BASIC INSPECTION >

INSPECTION AND ADJUSTMENT ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description

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[VDC/TCS/ABS]

×: Required -: Not required

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

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

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement

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 ANGLE SENSOR ADJUSTMENT" in	NЛ
2.	order. Touch "START".	IVI
	CAUTION:	
	Do not touch steering wheel while adjusting steering angle sensor.	N
3.	After approximately 10 seconds, touch "END".	
	NOTE:	
	After approximately 60 seconds, it ends automatically.	~
4.	Turn the ignition switch OFF, then turn it ON again.	0
	CAUTION:	
	Be sure to perform above operation.	
		Ρ
	>> 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 $: 0\pm 2.5^{\circ}$

< BASIC INSPECTION >

IVDC/TCS/ABS1

Is the steering angle within the specified range?

YES >> GO TO 4.

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

4.ERASE THE SELF-DIAGNOSIS MEMORY

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

ABS actuator and electric unit (control unit): Refer to <u>BRC-29, "CONSULT-III Function".</u>

• ECM: Refer to EC-102, "Diagnosis Description".

Are the memories erased?

YES >> INSPECTION END

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

CALIBRATION OF YAW RATE/SIDE/DECEL G SENSOR

CALIBRATION OF YAW RATE/SIDE/DECEL G SENSOR : Description

INFOID:00000003247292

×: Required -: Not required

When doing work that applies to the list below, make sure to calibration of yaw rate/side/decel G sensor before running vehicle.

Situation	Calibration of yaw rate/side/decel G sensor
Removing/Installing ABS actuator and electric unit (control unit)	×
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering components	_
Removing/Installing suspension components	_
Change tires to new ones	_
Tire rotation	_
Adjusting wheel alignment	_
Removing/Installing yaw rate/side/decel G sensor	×
Replacing yaw rate/side/decel G sensor	×

CALIBRATION OF YAW RATE/SIDE/DECEL G SENSOR : Special Repair Requirement

INFOID:000000003247293

CALIBRATION OF YAW RATE/SIDE/DECEL G SENSOR **CAUTION:**

- To calibrate yaw rate/side/decel G sensor, make sure to use CONSULT-III. (Calibration cannot be done without CONSULT-III.)
- Perform the G sensor calibration only with the vehicle parked on level surface.

1.ALIGN THE VEHICLE STATUS

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

- Keep all tires inflated to correct pressures. Adjust the tire pressure to the specified pressure value.
- Check that there is specified-load in vehicle other than the driver (or equivalent weight placed in driver's position).

>> GO TO 2.

2.PERFORM THE CALIBRATION OF YAW RATE/SIDE/DECEL G SENSOR

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

After approximately 60 seconds, it ends automatically.

Turn the ignition switch OFF, then turn it ON again. 4. CAUTION: Be sure to perform above operation.

< BASIC INSPECTION >

3: CHECK DATA MONITOR 3: CHECK DATA MONITOR 1: Run the vehicle with front wheels in straight-ahead position, then stop. 8: Select "DECEL G-SEN" in "DATA MONITOR" and check yaw rate/side/decel G sensor signal. 0: C DECEL G-SEN : :::0.08 G C Is the vaw rate/side/decel G within the specified range? C YES >> SO TO 4. C NO >> Perform the calibration of yaw rate/side/decel G sensor again, GO TO 1. 0 4:ERASE THE SELF-DIAGNOSIS MEMORY E Erase the self-diagnosis memories of the ABS actuator and electric unit (control unit) and ECM. E + CM: Refer to EC::02Diagnosis Description'. E Mo >> Perform the calibration of yaw rate/side/decel G sensor again, GO TO 1. E A: ERASE THE SELF-DIAGNOSIS MEMORY E Erase the self-diagnosis memories of the ABS actuator and electric unit (control unit); Refer to BRC::29. "CONSULT-III Function". E CALIBRATION OF PRESSURE SENSOR C C Mon doing work that applies to the list below, make sure to calibrate pressure sensor before sensor Required ~ Not required Removing/installing ABS actuator and electric unit (control unit) — Required ~ Not required Replacing brake components — — _ Removing/installing ABS actuator and elect	00.70.0		Δ
S.CHECK DAIA MONITOR I. Run the vehicle with front wheels in straight-ahead position, then stop. II. Run the vehicle with front wheels in straight-ahead position, then stop. III. 2. Select "DECEL G-SEN : ±0.08 G III. IIII. IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	>> GO TO 3.		
1. Run the vehicle with front wheels in straight-ahead position, then stop. B 2. Select "DECEL G-SEN" in "DATA MONITOR" and check yaw rate/side/decel G sensor signal. C DECEL G-SEN : ±0.08 G C Is the yaw rate/side/decel G within the specified range? C YES >> GO TO 4. D NO >> Perform the calibration of yaw rate/side/decel G sensor again, GO TO 1. D 4.ERASE THE SELF-DIAGNOSIS MEMORY D Frase the self-diagnosis memories of the ABS actuator and electric unit (control unit) and ECM. E * ABS actuator and electric unit (control unit): Refer to BRC-29. "CONSULT-III Function". E * ECM: Refer to EC-102. "Diagnosis Description." E YES >> NOPECTION END C NO >> Check the items indicated by the self-diagnosis. C CALIBRATION OF PRESSURE SENSOR Calibration of pressure sensor e When doing work that applies to the list below, make sure to calibrate pressure sensor before running vehicle. I Requiseid ABS actuator and electric unit (control unit) = . Replacing ABS actuator and electric unit (control unit) = <td< td=""><td colspan="2">J.CHECK DATA MONITOR</td><td></td></td<>	J.CHECK DATA MONITOR		
DECEL G-SEN: ::008 G C Is the year rate/side/decel G within the specified range? C YES: >> S0 T04. C No: >> Perform the calibration of yaw rate/side/decel G sensor again, GO T0 1. D 4.ERASE THE SELF-DIAGNOSIS MEMORY C Erase the self-diagnosis memories of the ABS actuator and electric unit (control unit), and ECM. ABS actuator and electric unit (control unit). Refer to BRC-29. "CONSULT-III Function". * Bit Refer to EC-102. "Diagnosis Description". BRC When the items indicated by the self-diagnosis. CALIBRATION OF PRESSURE SENSOR CALIBRATION OF PRESSURE SENSOR: Description C When doing work that applies to the list below, make sure to calibrate pressure sensor before running vehicle Required -: Not required Immoving/installing base actuator and electric unit (control unit) Replacing ABS actuator and electric unit (control unit) × Required -: Not required Replacing ABS actuator and electric unit (control unit) × Required -: Not required Replacing base components - - - Performing air bloading from bake piping - - K CALIBRATION OF PRESSURE SENSOR Special Repair Requirement Vecconseconcent Replacing braske fluid - -	 Run the vehicle with front wheels in straight-ahead Select "DECEL G-SEN" in "DATA MONITOR" and 	 Run the vehicle with front wheels in straight-ahead position, then stop. Select "DECEL G-SEN" in "DATA MONITOR" and check yaw rate/side/decel G sensor signal. 	
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NO >> Perform the calibration of yaw rate/side/decel is sensor again, GO TO 1. Image: Control 1. 4. ERASE THE SELF-DIAGNOSIS MEMORY Image: Control 1. Image: Contred: 1. Image: Contrel 1. <td>YES >> GO TO 4.</td> <td></td> <td></td>	YES >> GO TO 4.		
41. ERASE THE SELL-DIAGNOSIS MEMORY Frase the self-diagnosis memories of the ABS actuator and electric unit (control unit) and ECM. ABS actuator and electric unit (control unit): Refer to <u>ERC-29. "CONSULT-III Function".</u> ECM: Refer to EC-102. "Diagnosis Description". Are the memories erased? YES >> INSPECTION END NO >> Check the items indicated by the self-diagnosis. CALIBRATION OF PRESSURE SENSOR CALIBRATION OF PRESSURE SENSOR : Description When doing work that applies to the list below, make sure to calibrate pressure sensor before running wehicle.	NO >> Perform the calibration of yaw rate/side/de	cel G sensor again, GO TO 1.	D
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YES >> INSPECTION END Bit NO >> Check the items indicated by the self-diagnosis. G CALIBRATION OF PRESSURE SENSOR Image: Calibration of pressure sensor before running vehicle. 	Are the memories erased?		
NO >>> Check the items indicated by the self-diagnosis. CALIBRATION OF PRESSURE SENSOR G CALIBRATION OF PRESSURE SENSOR : Description wroncoccessees When doing work that applies to the list below, make sure to calibrate pressure sensor before running vehicle.	YES >> INSPECTION END	в.	RC
CALIBRATION OF PRESSURE SENSOR : Description G When doing work that applies to the list below, make sure to calibrate pressure sensor before running vehicle.	CALIBRATION OF PRESSURE SENSOR		
CALIBRATION OF PRESSURE SENSOR : Description NUTROACCONCENSENCE When doing work that applies to the list below, make sure to calibrate pressure sensor before running vehicle.	CALIBRATION OF TRESSORE SENSOR	X	G
When doing work that applies to the list below, make sure to calibrate pressure sensor before running vehicle. :: Required -: Not required Image: Situation Calibration of pressure sensor Removing/Installing ABS actuator and electric unit (control unit) - Replacing ABS actuator and electric unit (control unit) - Replacing ABS actuator and electric unit (control unit) - Replacing ABS actuator and electric unit (control unit) - Replacing brake components - Performing air bleeding from brake piping - Replacing brake fluid - CALIBRATION OF PRESSURE SENSOR M CALIBRATION OF PRESSURE SENSOR - * To calibrate pressure sensor, make sure to use CONSULT-III. (Calibration cannot be done without CONSULT-III.) M * Perform the pressure sensor calibration with the vehicle stopped. M • Never depress the brake pedal during the pressure sensor calibration. - 1.PERFORM THE CALIBRATION OF PRESSURE SENSOR M 1. On the CONSULT-III screen, touch "WORK SUPPORT" and "PRESS SEN CALIBRATION" in order. O 2. Touch "START". O 3. After approximately 10 seconds, touch "END". O 4. Turn the ignition switch OFF, then turn it ON again. CAUTION: Always pef	CALIBRATION OF PRESSURE SENSOR	: Description	
Situation Calibration of pressure sensor Removing/Installing ABS actuator and electric unit (control unit)	When doing work that applies to the list below, make su	ure to calibrate pressure sensor before running vehicle. ×: Required –: Not required	Η
Removing/Installing ABS actuator and electric unit (control unit) - - Replacing ABS actuator and electric unit (control unit) × Removing/Installing brake components - Replacing brake components - Performing air bleeding from brake piping - Replacing brake fluid - CALIBRATION OF PRESSURE SENSOR Special Repair Requirement CALIBRATION OF PRESSURE SENSOR - CAUTION: - To calibrate pressure sensor, make sure to use CONSULT-III. (Calibration cannot be done without CONSULT-III.) Perform the pressure sensor calibration with the vehicle stopped. - • Never depress the brake pedal during the pressure sensor calibration. 1. PERFORM THE CALIBRATION OF PRESSURE SENSOR N 1. On the CONSULT-III screen, touch "WORK SUPPORT" and "PRESS SEN CALIBRATION" in order. - 2. Touch "START". O 3. After approximately 10 seconds, touch "END". - 4. Turn the ignition switch OFF, then turn it ON again. -	Situation	Calibration of pressure sensor	
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Removing/Installing brake components - Replacing brake components - Performing air bleeding from brake piping - Replacing brake fluid - K CALIBRATION OF PRESSURE SENSOR : Special Repair Requirement CALIBRATION OF PRESSURE SENSOR MF000000000000000000000000000000000000	Replacing ABS actuator and electric unit (control unit)	×	
Replacing brake components - - - Performing air bleeding from brake piping - - K Replacing brake fluid - K CALIBRATION OF PRESSURE SENSOR : Special Repair Requirement MF000000000000000000000000000000000000	Removing/Installing brake components	_	
Performing air bleeding from brake piping - Replacing brake fluid - CALIBRATION OF PRESSURE SENSOR Improvide the second seco	Replacing brake components		J
Replacing brake fluid — K CALIBRATION OF PRESSURE SENSOR Special Repair Requirement MFORE 2000000000000000000000000000000000000	Performing air bleeding from brake piping		
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CAUTION: • To calibrate pressure sensor, make sure to use CONSULT-III. (Calibration cannot be done without CONSULT-III.) M • Perform the pressure sensor calibration with the vehicle stopped. • Never depress the brake pedal during the pressure sensor calibration. 1. PERFORM THE CALIBRATION OF PRESSURE SENSOR N 1. On the CONSULT-III screen, touch "WORK SUPPORT" and "PRESS SEN CALIBRATION" in order. N 2. Touch "START". O 3. After approximately 10 seconds, touch "END". O 4. Turn the ignition switch OFF, then turn it ON again. CAUTION: Always perform the above operation. P >> GO TO 2. P 2. CHECK DATA MONITOR CAUTION:	CALIBRATION OF PRESSURE SENSOR		L
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1. PERFORM THE CALIBRATION OF PRESSURE SENSOR N 1. On the CONSULT-III screen, touch "WORK SUPPORT" and "PRESS SEN CALIBRATION" in order. N 2. Touch "START". 3. After approximately 10 seconds, touch "END". O 4. Turn the ignition switch OFF, then turn it ON again. CAUTION: O >> GO TO 2. > P 2. CHECK DATA MONITOR N N	Never depress the brake pedal during the pressu	re sensor calibration.	
 On the CONSULT-III screen, touch "WORK SUPPORT" and "PRESS SEN CALIBRATION" in order. Touch "START". After approximately 10 seconds, touch "END". Turn the ignition switch OFF, then turn it ON again. CAUTION: Always perform the above operation. SGO TO 2. CHECK DATA MONITOR 	1. PERFORM THE CALIBRATION OF PRESSURE SE	ENSOR	Ν
 After approximately to seconds, touch END. Turn the ignition switch OFF, then turn it ON again. CAUTION: Always perform the above operation. > GO TO 2. CHECK DATA MONITOR 	 On the CONSULT-III screen, touch "WORK SUPPORT Touch "START". After approximately 10 accords, touch "END" 	ORT" and "PRESS SEN CALIBRATION" in order.	0
Always perform the above operation.	 4. Turn the ignition switch OFF, then turn it ON again. CAUTION: 		
>> GO TO 2. 2.CHECK DATA MONITOR	Always perform the above operation.		Ρ
2. CHECK DATA MONITOR	>> GO TO 2.		
	2. CHECK DATA MONITOR		

Select "PRESS SENSOR" in "DATA MONITOR" and check pressure sensor signal.

< BASIC INSPECTION >

Condition

DATA MONITOR Approx. 0 bar

Brake pedal is depressed Approx. -40 - 300 bar

Is the pressure within the specified range?

YES >> GO TO 3.

Brake pedal is released

NO >> Check pressure sensor. Refer to <u>BRC-64, "Diagnosis Procedure"</u>.

3. ERASE THE SELF-DIAGNOSIS MEMORY

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

Are the memories erased?

YES >> INSPECTION END

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

FUNCTION DIAGNOSIS

System Diagram





System Description

- In addition to the TCS/ABS function, the driver steering amount and brake operation amount are detected by the steering angle sensor and pressure sensor, and the vehicle's driving status (amount of under steering/ over steering) is determined by the information from the yaw rate/side/decel G sensor, wheel sensor, etc., and this information is used to improve vehicle stability by controlling the braking and engine power to all four wheels.
- The SLIP indicator lamp flashes to inform the driver of VDC operation.
- During VDC operation, the body and brake pedal lightly vibrate and mechanical noises may be heard. This is normal.
- The ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp might turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is on a turn table or a ship while the engine is running or steep slope such as bank. In this case, restart the engine on a normal road, and if the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turn OFF, there is no malfunction.

Component Parts Location

FOR USA

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[VDC/TCS/ABS]

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В



VDC

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

- A. Back of spiral cable assembly
- D. Steering knuckle
- G. Rear axle

- B. Combination meterE. Under center console
- C. Engine room (right side)
- F. Instrument driver lower panel



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[VDC/TCS/ABS]

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

Component Description

INFOID:00000003247131

Compo	onent parts	Reference
	Pump	PPC 11 "Description"
	Motor	BRC-44, Description
APS actuator and algotric unit (control unit)	Actuator relay (Main relay)	BRC-62, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-54, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-73, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-75, "Description"
Wheel sensor		BRC-34, "Description"
Yaw rate/side/decel G sensor		BRC-46, "Description"
Steering angle sensor		BRC-66, "Description"
VDC OFF switch		BRC-82, "Description"
ABS warning lamp		BRC-84, "Description"
Brake warning lamp		BRC-85, "Description"
VDC OFF indicator lamp		BRC-86, "Description"
SLIP indicator lamp		BRC-87, "Description"

System Diagram

ECM

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System Description

- The wheel spin of the drive wheels is detected by the ABS actuator and electric unit (control unit) using the wheel speed signals from the four wheels, so if wheel spin occurs, the drive wheel right and left brake fluid pressure control and engine fuel cut are conducted while the throttle valve opening is restricted to reduce the Κ engine torgue and decrease the amount of wheel spin. In addition, the throttle opening is controlled to achieve the optimum engine torque.
- Depending on road circumstances, the driver may have a sluggish feel. This is normal, because the optimum traction has the highest priority under TCS operation.
- TCS may be activated any time the vehicle suddenly accelerates, depressing accelerator pedal fully, suddenly downshifts, upshifts, or is driven on a road with a varying surface friction coefficient.
- During TCS operation, TCS informs a driver of system operation by flashing SLIP indicator lamp.

Component Parts Location

FOR USA

INFOID:00000003247133

INFOID:000000003305334



AWD control unit

with AWD models

TCS

Steering

angle sensor

[VDC/TCS/ABS]

Combination meter (Brake warning lamp, ABS warning lamp,

INFOID:00000003305333

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TCS

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

- Back of spiral cable assembly Α.
- D. Steering knuckle
- G. Rear axle

- Combination meter В. Ε.
 - Under center console

TCS

- C. Engine room (right side)
- F. Instrument driver lower panel



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[VDC/TCS/ABS]

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

Component Description

INFOID:000000003305335

Compo	onent parts	Reference
	Pump	PPC 44 "Description"
	Motor	BRC-44, Description
APS actuator and alactric unit (control unit)	Actuator relay (Main relay)	BRC-62, "Description"
Abs actuator and electric unit (control unit)	Solenoid valve	BRC-54, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-73, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-75, "Description"
Wheel sensor		BRC-34, "Description"
Yaw rate/side/decel G sensor		BRC-46, "Description"
Steering angle sensor		BRC-66, "Description"
VDC OFF switch		BRC-82, "Description"
ABS warning lamp		BRC-84, "Description"
Brake warning lamp		BRC-85, "Description"
VDC OFF indicator lamp		BRC-86, "Description"
SLIP indicator lamp		BRC-87, "Description"

ABS

System Diagram

INFOID:00000003305336

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В Combination meter (Brake warning lamp, ABS warning lamp, Steering AWD control unit ECM тсм angle sensor with AWD models VDC OFF indicator lamp, SLIP indicator lamp) Injector operation D signal CAN communication Е Front RH wheel sensor Yaw rate/side/decel G sensor Rear RH wheel BRC VDC OFF switch ABS actuator and sensor electric unit (control unit) Rear LH Н Front LH wheel wheel sensor sensor JSFIA0210GE

ABS

System Description

- The Anti-Lock Braking System detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system malfunction, then fail-safe function is activated, ABS becomes inoperative, and ABS warning lamp turns ON.
- Electrical system diagnosis by CONSULT-III is available.
- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting the vehicle after the ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine component. This is a normal status of operation check.
- Μ Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

Component Parts Location

INFOID:00000003305337 Ν

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FOR USA





ABS

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

- A. Back of spiral cable assembly
- D. Steering knuckle
- G. Rear axle

- B. Combination meterE. Under center console
- C. Engine room (right side)
- F. Instrument driver lower panel

[VDC/TCS/ABS]

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[VDC/TCS/ABS]

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

Component Description

INFOID:000000003305338

Compo	onent parts	Reference
	Pump	PPC 44 "Description"
	Motor	BRC-44, Description
APS actuator and alactric unit (control unit)	Actuator relay (Main relay)	BRC-62, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-54, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-73, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-75, "Description"
Wheel sensor		BRC-34, "Description"
Yaw rate/side/decel G sensor		BRC-46, "Description"
Steering angle sensor		BRC-66, "Description"
VDC OFF switch		BRC-82, "Description"
ABS warning lamp		BRC-84, "Description"
Brake warning lamp		BRC-85, "Description"
VDC OFF indicator lamp		BRC-86, "Description"
SLIP indicator lamp		BRC-87, "Description"

EBD

System Diagram



INFOID:00000003305339

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В

[VDC/TCS/ABS]

Combination meter (Brake warning lamp, ABS warning lamp, Steering AWD control unit ECM тсм angle sensor with AWD models VDC OFF indicator lamp, SLIP indicator lamp) Injector operation D signal CAN communication Е Front RH wheel sensor Yaw rate/side/decel G sensor Rear RH wheel BRC VDC OFF switch ABS actuator and sensor electric unit (control unit) Rear LH Н Front LH wheel wheel sensor sensor JSFIA0210GE INFOID:00000003247141

EBD

System Description

- Electronic Brake force Distribution detects subtle slippages between front and rear wheels during braking. and it improves handling stability by electronically controlling brake fluid pressure which results in reduced rear wheel slippage.
- If the electrical system malfunction, fail-safe function is activated, EBD and ABS becomes inoperative, and ABS warning lamp and brake warning lamp are turned ON.
- Electrical system diagnosis by CONSULT-III is available.
- During EBD operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting the vehicle after the ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Μ Stopping distance may be longer than that of vehicles without EBD when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

Component Parts Location

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EBD

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

- Back of spiral cable assembly Α.
- D. Steering knuckle
- G. Rear axle

- Combination meter В. Ε.
 - Under center console

EBD

- Engine room (right side)
- F. Instrument driver lower panel

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Revision: 2008 October

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1. Steering angle sensor 2. ABS warning lamp 3. Brake warning lamp VDC OFF indicator lamp 5. SLIP indicator lamp 6. ABS actuator and electric unit (con-4. trol unit) VDC OFF switch 7. Front wheel sensor 8. Yaw rate/side/decel G sensor 9. 10. Rear wheel sensor Α. Back of spiral cable assembly Β. Combination meter C. Engine room (right side)

EBD

- Steering knuckle D.
- G. Rear axle

Component Description

- Ε. Under center console
- F. Instrument driver lower panel

INFOID:000000003305341

Compo	onent parts	Reference
	Pump	PPC 44 "Description"
	Motor	BRC-44, Description
APS actuator and algotric unit (control unit)	Actuator relay (Main relay)	BRC-62, "Description"
	Solenoid valve	BRC-54, "Description"
	VDC switch-over valve (CV1, CV2)	BRC-73, "Description"
	VDC switch-over valve (SV1, SV2)	BRC-75, "Description"
Wheel sensor		BRC-34, "Description"
Yaw rate/side/decel G sensor		BRC-46, "Description"
Steering angle sensor		BRC-66, "Description"
VDC OFF switch		BRC-82, "Description"
ABS warning lamp		BRC-84, "Description"
Brake warning lamp		BRC-85, "Description"
VDC OFF indicator lamp		BRC-86, "Description"
SLIP indicator lamp		BRC-87, "Description"

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

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

DIAGNOSIS SYSTEM JABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

CONSULT-III Function

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FUNCTION

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

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

WORK SUPPORT

Item	Description	G
ST ANGLE SENSOR ADJUSTMENT	Adjusts the neutral position of the steering angle sensor.	
DECEL G SEN CALIBRATION	Calibrates yaw rate/side/decel G sensor.	Ц
PRESS SEN CALIBRATION	Calibrates pressure sensor.	

SELF-DIAGNOSTIC RESULT

Operation Procedure

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

Display Item List Refer to BRC-102, "DTC No. Index".

How to Erase Self-diagnosis Results

Κ 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. L

CAUTION:

If memory cannot be erased, perform applicable diagnosis. NOTE:

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

DATA MONITOR

Display Item List

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

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

			X: Applicable ▼: Optional item
	SELECT MC	DNITOR ITEM	
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks
FR LH SENSOR [km/h (MPH)]	×	×	
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed
RR LH SENSOR [km/h (MPH)]	×	×	Wheel speed
RR RH SENSOR [km/h (MPH)]	×	×	
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal status
BATTERY VOLT (V)	×	×	Battery voltage supplied to the ABS actuator and electric unit (control unit)
SLCT LVR POSI	×	×	Shift position judged by shift position signal
OFF SW (On/Off)	×	×	VDC OFF switch
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate/side/decel G sensor
DECEL G-SEN (G)	×	×	Decel G detected by yaw rate/side/decel 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/decel G sensor
STR ANGLE SIG (°)	×	▼	Steering angle detected by steering angle sensor
ENGINE RPM [tr/min (rpm)]	×	•	Engine speed
PRESS SENSOR (bar)	×	▼	Brake fluid pressure detected by pressure sensor
FR RH IN SOL (On/Off)	•	×	
FR RH OUT SOL (On/Off)	•	×	
FR LH IN SOL (On/Off)	•	×	
FR LH OUT SOL (On/Off)	•	×	Operation statue of each calencid value
RR RH IN SOL (On/Off)	•	×	
RR RH OUT SOL (On/Off)	•	×	
RR LH IN SOL (On/Off)	•	×	
RR LH OUT SOL (On/Off)	•	×	
MOTOR RELAY (On/Off)	•	×	Motor and motor relay operation
ACTUATOR RLY (On/Off)	▼	×	Actuator relay operation

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

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

	SELECT MONITOR ITEM			
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks	A
ABS WARN LAMP (On/Off)	▼	×	ABS warning lamp	В
OFF LAMP (On/Off)	•	×	VDC OFF indicator lamp	_
SLIP LAMP (On/Off)	▼	×	SLIP indicator lamp	С
CV1 (On/Off)	•	▼	Cut valve 1 monitor	D
CV2 (On/Off)	▼	▼	Cut valve 2 monitor	
SV1 (On/Off)	▼	▼	Suction valve 1 monitor	E
SV2 (On/Off)	▼	▼	Suction valve 2 monitor	BRC
EBD SIGNAL (On/Off)	•	▼	EBD operation	
ABS SIGNAL (On/Off)	•	▼	ABS operation	G
TCS SIGNAL (On/Off)	•	▼	TCS operation	Н
VDC SIGNAL (On/Off)	•	▼	VDC operation	
EBD FAIL SIG (On/Off)	•	▼	EBD fail-safe status	
ABS FAIL SIG (On/Off)	•	▼	ABS fail-safe status	J
TCS FAIL SIG (On/Off)	▼	▼	TCS fail-safe status	_
VDC FAIL SIG (On/Off)	▼	▼	VDC fail-safe status	Κ
EBD WARN LAMP (On/Off)	▼	▼	Brake warning lamp	L
4WD FAIL REQ (On/Off)	▼	•	AWD fail-safe signal status	_
2WD/4WD (2WD/4WD)	•	▼	Distinguish 2WD and AWD	Μ

ACTIVE TEST MODE

CAUTION:

- Do not perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.
- The active test cannot be started when the ABS warning lamp is ON.
- ABS warning lamp and brake warning lamp are ON during active test.

NOTE:

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

Test Item

ABS SOLENOID VALVE

• For ABS solenoid valve, touch "Up", "Keep" and "Down". Then use screen monitor to check that solenoid valve operates as shown in the table below.

BRC-31

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

< FUNCTION DIAGNOSIS >

[VDC/TCS/ABS]

Testitom	Display itom	Display			
lest tielli	Display item	Up	Keep	Down	
	FR RH IN SOL	Off	On	On	
	FR RH OUT SOL	Off	Off	On*	
FR RH SOL	CV1	Off	Off	Off	
	SV1	Off	Off	Off	
	FR LH IN SOL	Off	On	On	
	FR LH OUT SOL	Off	Off	On*	
FR LH SOL	CV2	Off	Off	Off	
	SV2	Off	Off	Off	
	RR RH IN SOL	Off	On	On	
	RR RH OUT SOL	Off	Off	On*	
	CV2	Off	Off	Off	
	SV2	Off	Off	Off	
	RR LH IN SOL	Off	On	On	
	RR LH OUT SOL	Off	Off	On*	
	CV1	Off	Off	Off	
	SV1	Off	Off	Off	

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

ABS SOLENOID VALVE (ACT)

• For 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.

Toot itom	Display itom	Display			
reschem	Display item	Up	ACT UP	ACT KEEP	
	FR RH IN SOL	Off	Off	Off	
FR RH ABS SOLENOID	FR RH OUT SOL	Off	Off	Off	
(ACT)	CV1	Off	On	On	
	SV1	Off	On*	Off	
	FR LH IN SOL	Off	Off	Off	
FR LH ABS SOLENOID	FR LH OUT SOL	Off	Off	Off	
(ACT)	CV2	Off	On	On	
	SV2	Off	On*	Off	
	RR RH IN SOL	Off	Off	Off	
RR RH ABS SOLENOID	RR RH OUT SOL	Off	Off	Off	
(ACT)	CV2	Off	On	On	
	SV2	Off	On*	Off	
	RR LH IN SOL	Off	Off	Off	
RR LH ABS SOLENOID	RR LH OUT SOL	Off	Off	Off	
(ACT)	CV1	Off	On	On	
	SV1	Off	On*	Off	

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

ABS MOTOR

• Touch "On" and "Off" on screen. Make sure motor relay and actuator relay operates as shown in table below.

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

< FUNCTION DIAGNOSIS >

Tost itom	Display itom	Display		
Test item	Display item	On	Off	
	MOTOR RELAY	On	Off	
ABS MOTOR	ACTUATOR RLY	On	On	

ECU PART NUMBER

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

[VDC/TCS/ABS]

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COMPONENT DIAGNOSIS C1101, C1102, C1103, C1104 WHEEL SENSOR

Description

INFOID:000000003247145

[VDC/TCS/ABS]

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:000000003247146

INFOID:00000003247147

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 short circuit. Current signal from sensor is outside limits.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	Harness or connectorWheel sensor
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open or short circuit. Current signal from sensor is outside limits.	

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 procedure. Refer to <u>BRC-34, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

- Do not measure the resistance value and also voltage between sensor terminals with tester etc., because the sensors are active sensors.
- Do not expand terminal of connector with a tester terminal stick, when it does the inspection with the tester.

1.CHECK TIRE

Check air pressure, wear, and size. Refer to WT-111, "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 that there is no damage or adherence of foreign matter on the sensor rotor surface.

- Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.
- Check that there is no deformation on the wheel sensor mounting surface.

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.

BRC-34

ABS actuator and electric unit (control unit) Wheel sensor

	Terminal	Connector		Terminal	Connector	
	4	RH)	E39 (Front	6		
E	2	LH)	E22 (Front	8		
Existed	8	(Rear RH)	C4 (2WD models) C6 (AWD models)	12	E36	
BR	6	(Rear LH)	C3 (2WD models) C5 (AWD models)	2		

ABS actuator and elect	ric unit (control unit)		Wheel sensor			
Connector	Terminal	Connect	Connector		Continuity	
	5	E39 (Front	RH)	3		
9		E22 (Front LH)		1		
E36	11	C4 (2WD models) C6 (AWD models)	(Rear RH)	7	Existed	
	3	C3 (2WD models) C5 (AWD models)	(Rear LH)	5		

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

	ABS actuator and elec	tric unit (control unit)		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	ŀ
	6, 5				_
F20	8, 9	520	E36 13, 26		
E30	12, 11	E30		inot existed	L
	2, 3				
Is the inspection resul	t normal?				N
YES >> GO TO 5.					
NO >> Repair or	replace damaged parts	3.			
5. CHECK WHEEL S	ENSOR POWER SUP	PLY CIRCUIT			ľ
1. Connect ABS act	uator and electric unit (control unit) connector	r.		_
2. Turn the ignition s	switch ON.				(
CAUTION:	_				C
Never start the e	ngine.				

3. Check the voltage between wheel sensor harness connector and ground.

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

Is the inspection result normal?

< COMPONENT DIAGNOSIS >

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 signal circuit

[VDC/TCS/ABS]

Continuity

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C1101, C1102, C1103, C1104 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Wh	eel sensor		Voltago	
Connect	or	Terminal		voltage
E39 (Front	RH)	3	-	
E22 (Front	LH)	1		
C4 (2WD models) C6 (AWD models)	(Rear RH)	7	Ground	Approx. 8 V or more
C3 (2WD models) C5 (AWD models)	(Rear LH)	5	1	

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 <u>BRC-36, "Component Inspection"</u>.

Is the inspection result normal?

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

Component Inspection

1.CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SEN-SOR", 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 <u>BRC-34, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000003251911

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

BRC-36

INFOID:000000003247148
C1101, C1102, C1103, C1104 WHEEL SENSOR

< COMPONENT DIAGNOSIS > [VDC/TCS/ABS]	
 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>". Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF YAW RATE/SIDE/DECEL C SENSOR : Description". 	A
Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u> .	В
>> END	
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C1105, C1106, C1107, C1108 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

C1105, C1106, C1107, C1108 WHEEL SENSOR

Description

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

INFOID:000000003247150

INFOID:000000003390265

INFOID:00000003390264

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	Signal from rear RH wheel sensor does not match other 3 wheel speed signal.	
C1106	RR LH SENSOR-2	Signal from rear LH wheel sensor does not match other 3 wheel speed signal.	Harness or connector Wheel sensor Sensor rotor
C1107	FR RH SENSOR-2	Signal from front RH wheel sensor does not match other 3 wheel speed signal.	ABS actuator and electric unit (control unit)
C1108	FR LH SENSOR-2	Signal from front LH wheel sensor does not match other 3 wheel speed signal.	

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 procedure. Refer to <u>BRC-38. "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

CAUTION:

- Do not measure the resistance value and also voltage between sensor terminals with tester etc., because the sensors are active sensors.
- Do not expand terminal of connector with a tester terminal stick, when it does the inspection with the tester.

1.CHECK TIRE

Check air pressure, wear, and size. Refer to <u>WT-111, "Tire Air Pressure"</u>.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2.CHECK SENSOR AND SENSOR ROTOR

• Check that there is no damage or adherence of foreign matter on the sensor rotor surface.

- Check sensor rotor for damage.
- Check wheel sensor for damage, disconnection or looseness.
- Check that there is no deformation on the wheel sensor mounting surface.

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, loose, etc.

Is the inspection result normal?

C1105, C1106, C1107, C1108 WHEEL SENSOR < COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

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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 signal circuit					_
ABS actuator and elected	ABS actuator and electric unit (control unit)		Wheel sensor	Continuity	C	
Connector	Terminal	Connect	or	Terminal	Continuity	
	6	E39 (Front	RH)	4		D
	8	E22 (Front	E22 (Front LH)			
E36	12	C4 (2WD models) C6 (AWD models)	(Rear RH)	8	Existed	Е
	2	C3 (2WD models) C5 (AWD models)	(Rear LH)	6		
Measurement terminal	for power supply circuit					BRO
ABS actuator and elect	ric unit (control unit)		Wheel sensor		Continuity	
Connector	Terminal	Connect	or	Terminal	Continuity	
	5	E39 (Front	RH)	3		G

		3	C5 (AWD models)	(Rear LH)	D		
2.	Check the continu	uity between ABS	actuator and elect	ric unit (co	ntrol unit) harness	connector.	

C4 (2WD models)

C6 (AWD models) C3 (2WD models)

E22 (Front LH)

(Rear RH)

(Rear LH)

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	ABS actuator and ele	ctric unit (control unit)		Continuity		
Connector	Terminal	Connector	Terminal	Continuity		
	6, 5					
500	8, 9	F20	E26	12.26 Not existe	Not ovicted	
E30	12, 11	E30	13, 20	NOT EXISTED		
	2, 3					

Is the inspection result normal?

YES >> GO TO 5.

E36

NO >> Repair or replace damaged parts.

5.CHECK WHEEL SENSOR POWER SUPPLY CIRCUIT

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1. Connect ABS actuator and electric unit (control unit) connector.

2. Turn the ignition switch ON. **CAUTION:**

Never start the engine.

Check the voltage between wheel sensor harness connector and ground.

Wheel sensor				Voltago
Connector		Terminal		voltage
E39 (Front	RH)	3		
E22 (Front	LH)	1		
C4 (2WD models) C6 (AWD models)	(Rear RH)	7	Ground	Approx. 8 V or more
C3 (2WD models) C5 (AWD models)	(Rear LH)	5		

C1105, C1106, C1107, C1108 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

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 <u>BRC-40, "Component Inspection"</u>.

Is the inspection result normal?

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

Component Inspection

INFOID:000000003390266

1.CHECK DATA MONITOR

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

Wheel sensor	Condition	Vehicle speed (DATA MONITOR)
	Vehicle stopped	0 [km/h (MPH)]
FR LH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)
	Vehicle stopped	0 [km/h (MPH)]
FR RH SENSOR	Vehicle running (Note)	Nearly matches the speedometer dis- play (±10% or less)
	Vehicle stopped	0 [km/h (MPH)]
RR LH SENSOR	Vehicle running (Note)	Nearly matches the speedometer display (±10% or less)
	Vehicle stopped	0 [km/h (MPH)]
RR RH SENSOR	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 <u>BRC-38, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000003390263

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10</u>, "CALIBRATION OF YAW RATE/SIDE/DECEL <u>G SENSOR : Description</u>".
- Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u>.

>> END

C1109 POWER AND GROUND SYSTEM

Description

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

DTC Logic

INFOID:000000003247154

INFOID:000000003247153

DTC DETECTION LOGIC

DTC	Displa	iy item	Malfunction detected con	dition	Possible cause	
C1109	BATTERY VO [ABNORMAL]	LTAGE V g	Vhen the ABS actuator and electric ur ower supply is lower than normal. Po reater than normal limits.	nit (control unit) wer supply is	 Harness or connector ABS actuator and electric unit (control unit) Fuse Vehicle electrical power system 	D
DTC CC	ONFIRMATIO	N PROCEDI	JRE			BR
1.DTC	REPRODUC	FION PROCED	URE			
1. Turn 2. Perfe	the ignition s orm ABS actu	witch OFF to C ator and electr	N. ic unit (control unit) self-diagno	osis.		G
YES NO	>> Proceed t >> INSPECT	o diagnosis pro ION END	ocedure. Refer to <u>BRC-41, "Dia</u>	<u>agnosis Procedu</u>	<u>ure"</u> .	Н
Diagno	osis Proced	lure			INFOID:00000003247155	
1. CHEC	CK CONNEC	FOR				I
1. Turn 2. Disc 3. Che	the ignition s connect ABS a ck terminal fo	witch OFF. actuator and ele r deformation, e	ectric unit (control unit) connec disconnection, looseness, etc.	tor.		J
YES NO 2. CHEC	>> GO TO 2. >> Repair or CK ABS ACT	replace damag	ed parts. ELECTRIC UNIT (CONTROL	. UNIT) POWEF	R SUPPLY CIRCUIT AND	K
GROUNI	D CIRCUIT		·	·		
1. Turn harn	ignition swite less connecto	ch ON or OFF r terminal and	and check voltage between A ground.	BS actuator and	d electric unit (control unit)	N
ABS	actuator and ele	ctric unit (control u	nit)	Condition	Voltago	
Co	onnector	Terminal		Condition	voltage	N
	E36	20	Ground	Ignition switch: ON	Battery voltage	
		20	Croana	Ignition switch: OEI		

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

ABS actuator and electric unit (control unit) IPDM E/R			M E/R	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E36	20	E10	25	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

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[VDC/TCS/ABS]

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C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

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 electr	ic unit (control unit)		Continuity	
Connector	Terminal		Continuity	
E36	13	Ground	Existed	
L30	26	Ground	LAISteu	

Is the inspection result normal?

YES >> Check battery for terminal looseness, low voltage, etc. if any malfunction is found, repair damaged parts.

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

Special Repair Requirement

INFOID:000000003390267

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

• Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

 Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.

Calibration of pressure sensor: Refer to <u>BRC-11</u>, "CALIBRATION OF PRESSURE SENSOR : Description".

>> END

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

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

Description

ABS actuator and electric unit (control unit) is continuously monitoring ECU hardware and software for correct peration.

DTC Logic

INFOID:000000003247157

INFOID:00000003247158

INFOID:000000003390268

INFOID:00000003247156

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DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1110	CONTROLLER FAILURE	Possible internal failure of control unit components.	Internal failure of control unit components. ABS solenoid valve or motor power supply / ground abnormal.	E
C1170	VARIANT CODING	V coding is not functioning.	ABS actuator and electric unit (control unit)	BR

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" or "C1170" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-43, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

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

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.
- Calibration of pressure sensor: Refer to <u>BRC-11</u>, "CALIBRATION OF PRESSURE SENSOR : Description".

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description

PUMP

The pump returns the brake fluid stored in the reservoir to the master cylinder by reducing the pressure.

MOTOR

The motor drives the pump according to the signals transmitted by the ABS actuator and electric unit (control unit).

MOTOR RELAY

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

DTC Logic

INFOID:000000003247160

INFOID:000000003247161

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

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

Is DTC "C1111" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-44, "Diagnosis Procedure"</u>.

NO >> INSPECTION ĔND

Diagnosis Procedure

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair damaged parts.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

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

ABS actuator and electr	ic unit (control unit)		Voltage
Connector	Terminal		voltage
E36	14	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

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

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

BRC-44

[VDC/TCS/ABS]

INFOID:00000003247159

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

INFOID:000000003247162

INFOID:000000003390269

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ABS actuator and electr	ic unit (control unit)		Continuity	
Connector Terminal			Continuity	
F36	13	Ground	Evisted	
E30	26	Ground	Existed	

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.)

Component Inspection

1.CHECK ACTIVE TEST

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

Test item	Display item	Display	
rest item	Display item	On	Off
ABS MOTOR	MOTOR RELAY	On	Off
	ACTUATOR RLY	On	On

Is the inspection result normal?

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

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.
- Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u>

>> END

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

< COMPONENT DIAGNOSIS >

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

Description

Yaw rate/side/decel G sensor detects yaw rate/side/decel G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic

INFOID:000000003247164

INFOID:00000003247163

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1113	G SENSOR	Harness or connector	
C1145	YAW RATE SENSOR		ABS actuator and electric unit (control unit)
C1146	SIDE G-SEN CIRCUIT	Yaw rate/side/decel G sensor is malfunctioning, or signal line of yaw rate/side/decel G sensor is open or shorted.	 Yaw rate/side/decel G sensor Electrical interference Vehicle driven on AWD rolling road

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 "C1113", "C1145" or "C1146" detected?

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

Diagnosis Procedure

INFOID:000000003247165

CAUTION:

- Sudden turns (such as spin turns, acceleration turns), drifting, etc. may cause yaw rate/side/decel G
 sensor circuit indicate a malfunction. However this is not a malfunction if normal operation can be
 resumed after restarting engine.
- When on a turntable, such as at a parking structure entrance, or when on a moving object with engine running, the VDC OFF indicator lamp might turn on and self-diagnosis using the CONSULT-III yaw rate sensor system malfunction might be displayed, but in this case there is no malfunction with yaw rate/side/decel G sensor circuit. As soon as the vehicle leaves the turntable or moving object, restart the engine to return the system 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/decel G sensor connector.
- 4. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair damaged parts.

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

1. Turn the ignition switch ON. CAUTION:

Never start the engine.

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

Yaw rate/side/de	cel G sensor		Voltago
Connector	Terminal		voltage
M52	3	Ground	Battery voltage

[VDC/TCS/ABS]

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR IVDC/TCS/ABS

< COMPONENT DIAGNOSIS >

3. Turn the ignition switch OFF.

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

Yaw rate/side/de	cel G sensor		Voltago	
Connector	Connector Terminal		voitage	
M52	3	Ground	Approx. 0 V	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

${f 3.}$ CHECK YAW RATE/SIDE/DECEL G SENSOR GROUND CIRCUIT

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

Yaw rate/side/de	cel G sensor		Continuity
Connector	Terminal		Continuity
M52	5	Ground	Existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace damaged parts.

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

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

ABS actuator and electric unit (control unit)		Yaw rate/side/o	decel G sensor	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
	25		1		
F00	19	M52	2		
E36	4		3	EXISTED	
	10		5		
Is the inspection result	t normal?				
YES >> GO TO 5.					

NO >> Repair or replace damaged parts.

5.CHECK YAW RATE/SIDE/DECEL G SENSOR

Check yaw rate/side/decel G sensor signal. Refer to BRC-47, "Component Inspection".

Is the inspection result normal?

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

NO >> Replace yaw rate/side/decel G sensor.

Component Inspection

1.CHECK DATA MONITOR

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

YAW RATE SENSOR

Vehicle condition	DATA MONITOR
Vehicle stopped	Approx. 0 d/s
Vehicle running	-100 to 100 d/s

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INFOID:000000003247166

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

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

SIDE G SENSOR

Vehicle condition	DATA MONITOR
Vehicle stopped	Approx. 0 m/s ²
Vehicle running	-16.7 - 16.7 m/s ²
DECEL G SENSOR	
Vehicle condition	DATA MONITOR
Vehicle stopped	Approx. 0 G
Vehicle running	–1.7 – +1.7 G

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-46, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000003258595

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

• After removing/replacing a yaw rate/side/decel G sensor, be sure to perform the following procedure.

 Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.

• After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

 Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.

- Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u>.

>> END

C1115 WHEEL SENSOR

Description

INFOID:000000003390271

DTC L	ogic		INFOID:00000003247168	
DTC DE	ETECTION LOGIC			С
DTC	Display item	Malfunction detected condition	Possible cause	С
C1115	ABS SENSOR [ABNORMAL SIGNAL]	Miss-match between the 4 wheel speed sensor signals.	Harness or connector not a pos- sible cause. Other possible causes tire radius (due to wrong size or pressure) interference.	E
отс сс	ONFIRMATION PROCEI	DURE		
.DTC	REPRODUCTION PROCE	EDURE		BF
I. Star 2. Perf <u>s DTC "</u> YES NO	t the engine and drive the form ABS actuator and election <u>C1115" detected?</u> >> Proceed to diagnosis p >> INSPECTION END	vehicle at 30 km/h (19 MPH) or more for approx ctric unit (control unit) self-diagnosis. procedure. Refer to <u>BRC-49, "Diagnosis Proced</u>	kimately 1 minute. lure".	G
Jiaana				
AUTIO Do no	DSIS Procedure N: In measure the resistance se the sensors are active	e value and also voltage between sensor t	INFOID:000000003390272	I
CAUTIO Do no becau Do no tester.	DSIS Procedure N: It measure the resistanc se the sensors are active t expand terminal of con CK TIRE	e value and also voltage between sensor f e sensors. nector with a tester terminal stick, when it do	INFOID:000000003390272	
AUTIO Do no becau Do no tester.	DSIS Procedure N: In measure the resistance se the sensors are active t expand terminal of con CK TIRE ir pressure, wear, and size	e value and also voltage between sensor f e sensors. nector with a tester terminal stick, when it do e. Refer to <u>WT-111, "Tire Air Pressure"</u> .	INFOID:000000003390272	ľ
AUTIO Do no becau Do no tester. .CHEC Check a sthe ins YES NO 2.CHEC	DSIS Procedure N: of measure the resistance se the sensors are active t expand terminal of com CK TIRE ir pressure, wear, and size spection result normal? >> GO TO 2. >> Repair or replace dam CK SENSOR AND SENSO	e value and also voltage between sensor f e sensors. nector with a tester terminal stick, when it do a Refer to <u>WT-111. "Tire Air Pressure"</u> . aged parts. DR ROTOR	INFOID:000000003390272	l L
AUTIO Do no becau Do no tester. .CHEC Check a s the ins YES NO Check Check Check Check Check	DSIS Procedure N: of measure the resistance se the sensors are active t expand terminal of come CK TIRE ir pressure, wear, and size spection result normal? >> GO TO 2. >> Repair or replace dame CK SENSOR AND SENSO that there is no damage of sensor rotor for damage. wheel sensor for damage.	e value and also voltage between sensor to e sensors. nector with a tester terminal stick, when it do e. Refer to <u>WT-111. "Tire Air Pressure"</u> . aged parts. DR ROTOR r adherence of foreign matter on the sensor roto , disconnection or looseness.	terminals with tester etc.,	L I I
AUTIO Do no becau Do no tester. CHEC Check a <u>s the ins</u> YES NO Check Check Check Check Check Check S the ins	DSIS Procedure N: t measure the resistance se the sensors are active t expand terminal of come CK TIRE ir pressure, wear, and size spection result normal? >> GO TO 2. >> Repair or replace dame CK SENSOR AND SENSO that there is no damage of sensor rotor for damage. wheel sensor for damage. wheel sensor for damage. wheel sensor for damage. wheel sensor for damage.	e value and also voltage between sensor to e sensors. nector with a tester terminal stick, when it do a. Refer to <u>WT-111, "Tire Air Pressure"</u> . aged parts. DR ROTOR r adherence of foreign matter on the sensor roto , disconnection or looseness. on on the wheel sensor mounting surface.	terminals with tester etc., bes the inspection with the	L N
AUTIO Do no becau Do no tester. .CHEC Check a the ins YES NO CHEC Check Check Check Check Check Check Check Check Check Check Check Check	DSIS Procedure N: t measure the resistance se the sensors are active t expand terminal of come CK TIRE ir pressure, wear, and size spection result normal? >> GO TO 2. >> Repair or replace dame CK SENSOR AND SENSO that there is no damage of sensor rotor for damage. wheel sensor for damage. Section result normal? >> GO TO 3. >> Repair wheel sensor no CK CONNECTOR	e value and also voltage between sensor to e sensors. nector with a tester terminal stick, when it do a. Refer to <u>WT-111, "Tire Air Pressure"</u> . aged parts. DR ROTOR r adherence of foreign matter on the sensor roto disconnection or looseness. on on the wheel sensor mounting surface.	INFOID:00000003390272 terminals with tester etc., bes the inspection with the or surface. self-diagnosis.	I I I I I I I I I I I I I I I I I I I

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C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

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 signal circuit				
ABS actuator and elect	ric unit (control unit)		Wheel senso	r	Continuity
Connector	Terminal	Connector		Terminal	Conunuity
	6	E39 (Front RH)		4	
	8	E22 (Front	LH)	2	
E36	12	C4 (2WD models) C6 (AWD models)	(Rear RH)	8	Existed
	2	C3 (2WD models) C5 (AWD models)	(Rear LH)	6	
Measurement terminal	for power supply circuit				
ABS actuator and elect	ric unit (control unit)		Wheel senso	r	Continuity
Connector	Terminal	Connect	or	Terminal	Continuity
	5	E39 (Front	RH)	3	
	9	E22 (Front	LH)	1	
E36	11	C4 (2WD models) C6 (AWD models)	(Rear RH)	7	Existed
	3	C3 (2WD models) C5 (AWD models)	(Rear LH)	5	

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

	Continuity			
Connector	Terminal	Connector	Terminal	Continuity
	6, 5			Not existed
E26	8, 9	E36	12.26	
E30	12, 11		15, 20	
	2, 3			

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.

Wh	eel sensor	_	Voltage	
Connector		Terminal		voltage
E39 (Front RH)		3		
E22 (Front LH)		1		
C4 (2WD models) C6 (AWD models) (Rear RH)		7	Ground	Approx. 8 V or more
C3 (2WD models) C5 (AWD models)	(Rear LH)	5		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace damaged parts.

C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >

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6. CHECK DATA MONITOR

1. Turn the ignition switch OFF.

- Connect each wheel sensor connector. 2.
- Check wheel sensor signal. Refer to <u>BRC-51, "Component Inspection"</u>. 3.

Is the inspection result normal?

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

Component Inspection

1.CHECK DATA MONITOR

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

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

Confirm tire pressure is normal.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-49, "Diagnosis Procedure"</u>.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

Μ After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

 Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9, "ADJUSTMENT OF STEERING</u> Ν ANGLE SENSOR NEUTRAL POSITION : Description".

 Calibration of yaw rate/side/decel G sensor: Refer to BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL G SENSOR : Description".

Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u>.

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INFOID:000000003390274

C1116 STOP LAMP SWITCH

Description

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

DTC Logic

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INFOID:000000003247173

INFOID:00000003247171

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 <u>BRC-52, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

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

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Replace or repair damaged parts.
- 2. CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to <u>BRC-53, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace stop lamp switch.

3.CHECK STOP LAMP SWITCH CIRCUIT

- 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)			Condition	Voltago	
Connector	Terminal		Condition	voltage	
E36 16 Group		Ground	Brake pedal is depressed	Battery voltage	
	10	Clound	Brake pedal is released	Approx. 0 V	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace damaged parts.

C1116 STOP LAMP SWITCH

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

Component Ins	spection		INFOID:00000003247174	
1.CHECK STOP	LAMP SWITCH			А
 Turn the ignition Disconnect store Check the corr 	on switch OFF. op lamp switch connector. ntinuity between stop lamp switch	n connector termir	nals.	В
Stop lamp switch Terminal	Condition	Continuity		С
$3 - 4^{*1}$	Release stop lamp switch (When brake pedal is depressed.)	Existed	-	D
$1 - 2^{*2}$	Push stop lamp switch (When brake pedal is released.)	Not existed	-	_
 *1: Up to VIN: JN8A (For Mexico) 	Z18U*9W100000, JN8AZ18W*9W2000	00 (Except for Mexice	o), JN8AZ18U*9W710000, JN8AZ18W*9W810000	E
• *2: From VIN: JN8A (For mexico)	Z18U*9W100001, JN8AZ18W*9W2000	01 (Except for Mexico	o), JN8AZ18U*9W710001, JN8AZ18W*9W810001	BR
Is the inspection re YES >> INSPE NO >> Repla	<u>esult normal?</u> ECTION END ce stop lamp switch. Refer to <u>BR</u>	-20, "Exploded Vi	ew".	G
Special Repair	Requirement		INF01D:00000003390275	
1. ADJUSTMENT SIDE/DECEL G SE	OF STEERING ANGLE SENSO	OR NEUTRAL PC PRESSURE SEN	SITION, CALIBRATION OF YAW RATE/	Η
After removing/rep	placing an ABS actuator and elec	tric unit (control u	init), be sure to perform the following pro-	I
Adjustment of s <u>ANGLE SENSO</u>	teering angle sensor neutral po <u>R NEUTRAL POSITION : Descri</u>	psition: Refer to j ption".	BRC-9, "ADJUSTMENT OF STEERING	J
G SENSOR : De	escription".		DE DEESCURE SENSOR : Deparintion"	
	essure sensor. Relef to <u>BRC-11.</u>		DF PRESSURE SENSOR . Description.	Κ
>> END				I
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C1120, C1122, C1124, C1126 IN ABS SOL

Description

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

INFOID:000000003247179

INFOID:00000003247180

INFOID:00000003247178

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch ON.

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

Is DTC "C1120", "C1122", "C1124" or "C1126" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>BRC-54, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair 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 electr	ic unit (control unit)		Voltago
Connector	Connector Terminal		voltage
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

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

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

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

INFOID:000000003247181

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ABS actuator and electr	ic unit (control unit)		Continuity	
Connector	Terminal	_		
F36	13	Ground	Evisted	
E36 26		Ground	LAISted	

Is the inspection result normal?

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

NO >> Repair or replace damaged parts.

Component Inspection

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.

Toot itom	Diaplay itom		Display		BRC
Test lient	Display item	Up	Кеер	Down	
	FR RH IN SOL	Off	On	On	G
	FR RH OUT SOL	Off	Off	On*	0
FR RH 30L	CV1	Off	Off	Off	
	SV1	Off	Off	Off	Н
	FR LH IN SOL	Off	On	On	
	FR LH OUT SOL	Off	Off	On*	
FR LH SOL	CV2	Off	Off	Off	
	SV2	Off	Off	Off	
	RR RH IN SOL	Off	On	On	J
	RR RH OUT SOL	Off	Off	On*	
KK KH SUL	CV2	Off	Off	Off	
	SV2	Off	Off	Off	K
	RR LH IN SOL	Off	On	On	
	RR LH OUT SOL	Off	Off	On*	L
	CV1	Off	Off	Off	
	SV1	Off	Off	Off	

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-54, "Diagnosis Procedure"</u>.

Special Repair Requirement

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10. "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.
- Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u>.

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INFOID:000000003390276

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

>> END

C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

INFOID:00000003247183

INFOID:000000003390278

DTC DETECTION LOGIC

DTC	Disp	lay item	Malfund	tion detected condition	Possible cause	D
C1121	FR LH OUT	ABS SOL	When the control un LH outlet solenoid ci	it detects a malfunction in the front rcuit.		
C1123	FR RH OUT	ABS SOL	When the control un RH outlet solenoid c	it detects a malfunction in the front ircuit.	ABS actuator and electric unit	E
C1125	RR LH OUT	ABS SOL	When the control unit outlet solenoid circuit	t detects a malfunction in the rear LH t.	(control unit)	BR
C1127	RR RH OUT	ABS SOL	When the control un RH outlet solenoid c	it detects a malfunction in the rear ircuit.		
DTC CC	NFIRMATI	ON PROCE	DURE			G
1. DTC F	REPRODUC	TION PROCE	DURE			
1. Turn 2. Perfe	the ignition orm ABS act	switch ON. tuator and elec	ctric unit (control u	ınit) self-diagnosis.		Η
<u>Is DTC "(</u>	<u>C1121", "C1</u>	<u>123", "C1125"</u>	or "C1127" detect	ed?		
YES NO	>> Proceed >> INSPEC	to diagnosis p TION END	rocedure. Refer to	o <u>BRC-57, "Diagnosis Proced</u>	lure".	I
Diagno	sis Proce	dure			INFOID:00000003390279	J.
1. CHEC		TOR				0
 Turn Disco Cheo 	the ignition onnect ABS ck terminal f	switch OFF. actuator and or or deformation	electric unit (contr , disconnection, lo	ol unit) connector. poseness, etc.		Κ
<u>Is the ins</u> YES	pection resu	<u>ult normal?</u> 2.				L
NO	>> Replace	or repair dama	aged parts.			
2. CHEC	K SOLENO	ID, VDC SWI	CH-OVER VALV	E AND ACTUATOR RELAY P	OWER SUPPLY CIRCUIT	M
Check th	e voltage be	etween ABS ad	tuator and electri	c unit (control unit) harness co	onnector and ground.	
		• • • • • •	0			N
ABS actu	ator and electr		t)	Voltage		IN
Co	nnector	Ierminal				
	E36	1	Ground	Battery voltage		0
Is the ins	pection resu	<u>uit normal?</u>				
YES NO	>> GO TO 3 >> Repair o	s. r replace dam:	aged parts.			
3.CHEC	K SOLENO	ID. VDC SWIT		E AND ACTUATOR RELAY G	ROUND CIRCUIT	Р
				tric unit (control unit) borness	connector and ground	
	e continuity	Detween ADO			o connector and ground.	

[VDC/TCS/ABS]

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C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator and electr	ic unit (control unit)		Continuity	
Connector	Terminal			
F36	13	Ground	Existed	
L30	26	Ground	Existed	

Is the inspection result normal?

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

NO >> Repair or replace damaged parts.

Component Inspection

INFOID:000000003390280

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.

Testitom	Display item	Display		
lest tielli		Up	Кеер	Down
	FR RH IN SOL	Off	On	On
	FR RH OUT SOL	Off	Off	On*
TR RH SOL	CV1	Off	Off	Off
	SV1	Off	Off	Off
	FR LH IN SOL	Off	On	On
	FR LH OUT SOL	Off	Off	On*
	CV2	Off	Off	Off
	SV2	Off	Off	Off
	RR RH IN SOL	Off	On	On
	RR RH OUT SOL	Off	Off	On*
	CV2	Off	Off	Off
	SV2	Off	Off	Off
RR LH SOL	RR LH IN SOL	Off	On	On
	RR LH OUT SOL	Off	Off	On*
	CV1	Off	Off	Off
	SV1	Off	Off	Off

 $^{\ast}:$ On for 1 to 2 seconds after the touch, and then Off.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-57, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000003390277

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.
- Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u>.

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C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >	[VDC/TCS/ABS]
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C1130 ENGINE SIGNAL

Description

INFOID:000000003247186

[VDC/TCS/ABS]

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

DTC Logic

INFOID:000000003247187

INFOID:000000003247188

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1	ECM signals are invalid or ECM self diagnosis indicates a fault that prevents correct TCS operation.	 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 <u>BRC-60, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

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 vehicle. 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

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.
- Calibration of pressure sensor: Refer to <u>BRC-11</u>, "CALIBRATION OF PRESSURE SENSOR : Description".

BRC-60

INFOID:00000003390281

C1130 ENGINE SIGNAL

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C1140 ACTUATOR RELAY SYSTEM

Description

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

DTC Logic

INFOID:000000003247190

INFOID:00000003247189

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1140		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	
01140		During the actuator relay operating with ON, when the actuator relay turns ON, or when the control line for the relay is open.	(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 "C1140" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-62, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.

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

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair 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 electr	ic unit (control unit)		Voltago
Connector Terminal		_	voltage
E36	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

${f 3.}$ 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		Continuity
E36	13	Ground	Existed
E30	26	Ground	Existed

BRC-62

INFOID:000000003247191

C1140 ACTUATOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

INFOID:00000003390270

Is the inspection result normal?

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

Component Inspection

1.CHECK ACTIVE TEST

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

Test item	Display itom	Display	
	Display item	On	Off
ABS MOTOR	MOTOR RELAY	On	Off
	ACTUATOR RLY	On	On

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-62, "Diagnosis Procedure"</u>.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR H

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.
- Calibration of pressure sensor: Refer to <u>BRC-11</u>, "CALIBRATION OF PRESSURE SENSOR : Description".

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C1142 PRESS SENSOR

Description

INFOID:000000003247311

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:000000003247312

INFOID:000000003247313

DTC DETECTION LOGIC

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

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 <u>BRC-64, "Diagnosis Procedure"</u>.

NO >> INSPECTION ĔND

Diagnosis Procedure

1.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to BRC-52. "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2. CHECK DATA MONITOR

Check pressure sensor signal. Refer to <u>BRC-64, "Component Inspection"</u>.

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-9, "Inspection and Adjustment".
 - Brake booster: Refer to <u>BR-15, "Inspection"</u>.
 - Master cylinder: Refer to <u>BR-14, "Inspection"</u>.

$\mathbf{3}$. 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:000000003247314

1.CHECK DATA MONITOR

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

BRC-64

C1142 PRESS SENSOR

< COMPONENT DIAGNOSIS >

Condition	PRESS SENSOR (DATA MONITOR)		А
With ignition switch turned ON and brake pedal released.	Approx. 0 bar		_
With ignition switch turned ON and brake pedal depressed.	0 to 170 bar		В
Is the inspection result normal?YES>> INSPECTION ENDNO>> Proceed to diagnosis procedure. Reference	er to <u>BRC-64, "Diac</u>	inosis Procedure".	С
Special Repair Requirement		INFOID:00000003398543	
1. ADJUSTMENT OF STEERING ANGLE SENSIBLE/DECEL G SENSOR AND CALIBRATION O	SOR NEUTRAL PO F PRESSURE SEN	SITION, CALIBRATION OF YAW RATE/	D
After removing/replacing an ABS actuator and ele	ectric unit (control u	nit), be sure to perform the following pro-	Е
 Adjustment of steering angle sensor neutral r 	position: Refer to I	BRC-9. "ADJUSTMENT OF STEERING	
ANGLE SENSOR NEUTRAL POSITION : Desc	ription".		BR
 Calibration of yaw rate/side/decel G sensor: Ref G SENSOR : Description" 	fer to <u>BRC-10, "CAI</u>	IBRATION OF YAW RATE/SIDE/DECEL	
Calibration of pressure sensor: Refer to <u>BRC-11</u>	I, "CALIBRATION C	OF PRESSURE SENSOR : Description".	G
>> END			Н
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C1143 STEERING ANGLE SENSOR

Description

The steering angle sensor detects the rotation amount, angular velocity and direction of the steering wheel, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

DTC Logic

INFOID:000000003247194

INFOID:00000003247195

INFOID:00000003247193

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1143	ST ANG SEN CIRCUIT	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	 Harness or connector Steering angle sensor ABS actuator and electric unit (control unit)

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 <u>BRC-66, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK CONNECTOR

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace or repair damaged parts.

2.CHECK STEERING ANGLE SENSOR HARNESS

1. Turn the ignition switch ON. CAUTION:

Never start the engine.

2. Check the voltage between steering angle sensor harness connector and ground.

Steering angle sensor Connector Terminal			Voltage
			voltage
M30	4	Ground	Battery voltage

3. Turn ignition switch OFF.

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

Steering angle sensor			Continuity	
Connector	Terminal		Continuity	
M30	1	Ground	Existed	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

C1	143 STEERING ANGLE SEN	ISOR
< COMPONENT DIAGNOSIS >		[VDC/TCS/ABS]
3. CHECK STEERING WHEEL P	LAY	
Check steering wheel play. Refer t	o ST-12, "Inspection".	
Is the inspection result normal?		
YES >> GO TO 4.	where the second s	
	piay.	
 Connect the steering angle se Check steering angle sensor s 	nsor connector and ABS actuator and signal. Refer to BRC-67, "Component	I electric unit (control unit) connector.
Is the inspection result normal?		
YES >> Replace ABS actuator	and electric unit (control unit).	
NO >> Adjust neutral position	of steering angle sensor.	
Component Inspection		INFOID:00000003247196
Select "STR ANCLE SIC" in "DAT	A MONITOP" and shock stooring and	
Select STR ANGLE SIG III DAI	A MONTOR and check steering ang	e sensor signal.
Steering condition	STR ANGLE SIG (DATA MONITOR)	
Driving straight	-3.5 - +3.5°	
Turn 90 ° to right	Approx. –90 °	
Turn 90 ° to left	Approx. +90 °	
Is the inspection result normal?		
YES >> INSPECTION END		
NO >> Proceed to diagnosis		<u>sis Procedure</u> .
Special Repair Requirement	nt	INFOID:000000003247197
1. ADJUSTMENT OF STEERING	ANGLE SENSOR NEUTRAL POSIT	ION, CALIBRATION OF YAW RATE/
SIDE/DECEL G SENSOR AND CA	LIBRATION OF PRESSURE SENSO)R
 After removing/replacing a steer 	ng angle sensor, be sure to perform th	he following procedure.
 Adjustment of steering angle s ANGLE SENSOR NEUTRAL PC 	ensor neutral position: Refer to <u>BRC</u>)SITION · Description"	<u>C-9, "ADJUSTMENT OF STEERING</u>
• After removing/replacing an AB	S actuator and electric unit (control u	init), be sure to perform the following
procedure.	ensor neutral position. Refer to BR(C-9 "AD IUSTMENT OF STEERING
ANGLE SENSOR NEUTRAL PC	SITION : Description".	53, ADUCONNENT OF OTELLING
 Calibration of yaw rate/side/dece CSENSOR : Description" 	I G sensor: Refer to <u>BRC-10, "CALIB</u>	RATION OF YAW RATE/SIDE/DECEL
 Calibration of pressure sensor: F 	Refer to <u>BRC-11, "CALIBRATION OF F</u>	PRESSURE SENSOR : Description".
>> END		

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< COMPONENT DIAGNOSIS >

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Logic

INFOID:000000003251895

[VDC/TCS/ABS]

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch ON.
- 2. Select "ST ANGLE SENSOR 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 <u>BRC-68, "Diagnosis Procedure"</u>.
- NO >> INSPECTION ĔND

Diagnosis Procedure

1.CHECK STEERING ANGLE SENSOR

Check steering angle sensor. Refer to BRC-66. "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:000000003398544

INFOID:00000003251896

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

- After removing/replacing a steering angle sensor, be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".
- After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.
- Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u>.

>> END

C1155 BRAKE FLUID LEVEL SWITCH

Description

The brake fluid level switch converts the brake fluid level to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

DTC Logic

INFOID:000000003247199

INFOID:000000003247198

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С

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	D
C1155	BR FLUID LEVEL LOW	Ignition switch ON and brake fluid signal low or not avail- able for 10 seconds.	 Brake fluid level low Brake fluid level switch failure Wiring to brake fluid level switch short circuit 	E
DTC CO	NFIRMATION PROCEI	DURE		
1. DTC F	REPRODUCTION PROCE	EDURE		BRC
1. Turn	the ignition switch ON.			
2. Perfo	orm ABS actuator and ele	ctric unit (control unit) self-diagnosis.		G
IS DTC "(C1155" detected?			
YES NO	>> Proceed to diagnosis p >> INSPECTION END	procedure. Refer to <u>BRC-69, "Diagnosis Proced</u>	<u>ure"</u> .	
Diagno	sis Procedure		INFO ID-000000000 47000	Н
A			INFOID.00000003247200	
1. CHEC	K BRAKE FLUID LEVEL			
Check th	e brake fluid level.			
<u>Is the ins</u>	pection result normal?			.1
YES	>> GO TO 2.			0
	K BRAKE WARNING LAI	MP 1		Κ
Check th	at the brake warning lamp	illuminates after the ignition switch is turned OI	Ν.	
IS the ins	pection result normal?			I
NO	>> Check wiring to brake	fluid level switch.		-
3.CHEC	K BRAKE WARNING I AI	MP 2		
Check th	at the brake warning lamp	\sim in the combination meter turns ON/OFE correct	ly when operating the park-	\mathbb{M}
ing brake	er the brake warning lamp		ily when operating the park	
Is the ins	pection result normal?			N
YES	>> GO TO 4.			1 1
NO 1	> Check parking brake s	switch.		
4. CHEC	K CONNECTOR			0
1. Turn	the ignition switch OFF.			
2. Disci 3 Cher	onnect brake fluid level sv	vitch connector and combination meter connector disconnection looseness etc	Dr.	D
Is the ins	pection result normal?			F
YES	>> GO TO 5.			
NO	>> Replace or repair dam	aged parts.		
5. CHEC	K BRAKE FLUID LEVEL	SWITCH		
Check br	ake fluid level switch. Ref	er to BRC-70, "Component Inspection".		
Is the inspection result normal?				

C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

YES >> GO TO 6.

NO >> Brake fluid level switch is malfunction. Replace reservoir tank.

6.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT

1. Check the continuity between brake fluid level switch harness connector and combination meter harness connector.

Combination meter		Brake fluid level switch		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M34	27	E37	1	Existed

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

Brake fluid level switch		Continuity		
Connector	Terminal		Continuity	
E37	2	Ground	Existed	

Is the inspection result normal?

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

NO >> Repair or replace damaged parts.

Component Inspection

1. CHECK BRAKE FLUID LEVEL SWITCH

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

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-69, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000003398545

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.
- Calibration of pressure sensor: Refer to <u>BRC-11</u>, "CALIBRATION OF PRESSURE SENSOR : Description".

>> END

INFOID:000000003247201

C1160, C1161 INCOMPLETE YAW RATE/SIDE/DECEL G SENSOR CALIBRA-TION

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

C1160, C1161 INCOMPLETE YAW RATE/SIDE/DECEL G SENSOR CALI-BRATION

DTC Logic

INFOID:000000003251900

А

В

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	С
C1160	DECEL G SEN SET		Harness or connector	
C1161	SIDE G SEN SET	Calibration of yaw rate/side/decel G sensor is not fin- ished.	 Yaw rate/side/decel G sensor ABS actuator and electric unit (control unit) 	D
DTC CC	NFIRMATION PROCEI	DURE		_
1.DTC	REPRODUCTION PROCE	EDURE		E
 Turn Sele dece Perfe Is DTC " 	the ignition switch ON. ect "DECEL G SEN CALIB of G sensor. orm ABS actuator and ele C1160" or "C1161" detected	RATION" in "WORK SUPPORT", and perform ctric unit (control unit) self-diagnosis.	calibration of yaw rate/side/	BRC
YES NO	>> Proceed to diagnosis p >> INSPECTION END	procedure. Refer to <u>BRC-71, "Diagnosis Procec</u>	<u>lure"</u> .	9
Diagno	sis Procedure		INFOID:00000003251901	Н
1				
I.CHECK YAW RATE/SIDE/DECEL & SENSOR				
Check yaw rate/side/decel G sensor. Refer to <u>BRC-47, "Component Inspection"</u> .				
YES NO	 >> Replace ABS actuator >> Repair or replace dam 	and electric unit (control unit). aged parts.		J
Specia	I Repair Requiremer	nt	INFOID:00000003406710	
1.ADJU SIDE/DE	ISTMENT OF STEERING	ANGLE SENSOR NEUTRAL POSITION, CAL	IBRATION OF YAW RATE/	K
After re Calibra G SEN	emoving/replacing a yaw rate/side/dece	ate/side/decel G sensor, be sure to perform the I G sensor: Refer to <u>BRC-10, "CALIBRATION C</u>	following procedure. DF YAW RATE/SIDE/DECEL	L
After re proced	emoving/replacing an ABS lure.	S actuator and electric unit (control unit), be s	ure to perform the following	M
 Adjustr <u>ANGLE</u> Calibra <u>G SEN</u> 	ment of steering angle so <u>SENSOR NEUTRAL PC</u> ation of yaw rate/side/dece <u>ISOR : Description"</u> .	ensor neutral position: Refer to <u>BRC-9, "ADJ</u> <u>SITION : Description"</u> . I G sensor: Refer to <u>BRC-10, "CALIBRATION C</u>	DF YAW RATE/SIDE/DECEL	Ν
- Calibra	ation of pressure sensor: R	tefer to <u>BRC-11, "CALIBRATION OF PRESSUF</u>	<u>RE SENSOR : Description"</u> .	0
	>> END			U

C1162 INCOMPLETE PRESSURE SENSOR CALIBRATION

< COMPONENT DIAGNOSIS >

C1162 INCOMPLETE PRESSURE SENSOR CALIBRATION

Description

INFOID:000000004684888

[VDC/TCS/ABS]

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:000000004684885

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1162	PRESS SEN SET	Calibration of pressure sensor is not finished.	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch ON.
- 2. Perform calibration of pressure sensor. Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR :</u> <u>Description"</u>.
- 3. Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is DTC "C1162" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-72, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000004684886

1.PERFORM PRESSURE SENSOR CALIBRATION

Select "PRESS SEN CALIBRATION" of "WORK SUPPORT". Perform the pressure sensor calibration. <u>Is pressure sensor calibration completed?</u>

YES >> INSPECTION END

2.CHECK PRESSURE SENSOR

Check pressure sensor. Refer to BRC-64. "Diagnosis Procedure".

Is the inspection result normal?

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

NO >> Repair or replace error-detected parts.

Special Repair Requirement

INFOID:000000004685075

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.
- Calibration of pressure sensor: Refer to <u>BRC-11</u>, "CALIBRATION OF PRESSURE SENSOR : Description".

>> END
C1164, C1165 CV SYSTEM

< COMPONENT DIAGNOSIS >

C1164, C1165 CV SYSTEM

Description

INFOID:000000003247202

А

В

С

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

DTC Logic

INFOID:000000003247203

DTC DETECTION LOGIC

DTC	Displa	ay item	Malfun	ction detected condit	tion	Possible cause	
C1164	CV1	V s o	DC switch-over so ide is open circuit o r shorted to the po	lenoid valve (CV1) o or shorted, or the cor wer supply or the gro	n the primary htrol line is open bund.	Harness or connector ABS actuator and electric unit	D
C1165	CV2	V s o	DC switch-over so ide is open circuit o r shorted to the po	lenoid valve (CV2) of or shorted, or the cor wer supply or the gro	n the secondary htrol line is open bund.	(control unit)	E
DTC CC	ONFIRMATIO	ON PROCEDU	JRE				BR
1.DTC	REPRODUC	TION PROCED	URE				
1. Turn 2. Perfe Is DTC " YES NO	the ignition s orm ABS actu <u>C1164" or "C</u> >> Proceed t >> INSPECT	switch ON. Jator and electr 1165" detected to diagnosis pro TON END	ic unit (control 2 ocedure. Refer	unit) self-diagnos to <u>BRC-73, "Diac</u>	sis. Inosis Proced	ure".	G H
Diagno	sis Proced	dure				INFOID:00000003247204	
1.снес	CK CONNEC	TOR					I
 Turn Disc Chee 	the ignition s connect ABS a ck terminal fo	witch OFF. actuator and ele or deformation, o	ectric unit (conti disconnection, l	rol unit) connecto looseness, etc.	or.		J
Is the ins YES NO 2 CHEC	Spection results Solution results	<u>It normal?</u> or repair damag	ed parts.				K
Check th	ne voltage bet	ween ABS actu	ator and electr	ic unit (control ur	nit) harness co	onnector and ground.	L
ABS actu	lator and electric		_	Voltage			IVI
	E36	1	Ground	Battery voltage	-		
Is the ins	spection resul	It normal?					Ν
YES NO 3. CHEC	- >> GO TO 3. >> Repair or CK SOLENOI	replace damag	ed parts. H-OVER VALV	'E AND ACTUAT	OR RELAY G	ROUND CIRCUIT	0
Check th	ne continuity b	petween ABS a	ctuator and ele	ctric unit (control	unit) harness	connector and ground.	
				•	•	-	Ρ
ABS actu	uator and electric	c unit (control unit)		Continuity			

ABS actuator and electr	ic unit (control unit)		Continuity	
Connector	Terminal			
F36	13	Ground	Existed	
230	26	Ground	Existed	

Is the inspection result normal?

[VDC/TCS/ABS]

< COMPONENT DIAGNOSIS >

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

Component Inspection

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.

Tost itom	Display itom	Display			
leschem	Display item	Up	ACT UP	ACT KEEP	
	FR RH IN SOL	Off	Off	Off	
FR RH ABS SOLENOID	FR RH OUT SOL	Off	Off	Off	
(ACT)	CV1	Off	On	On	
	SV1	Off	On*	Off	
	FR LH IN SOL	Off	Off	Off	
FR LH ABS SOLENOID (ACT)	FR LH OUT SOL	Off	Off	Off	
	CV2	Off	On	On	
	SV2	Off	On*	Off	
	RR RH IN SOL	Off	Off	Off	
RR RH ABS SOLENOID	RR RH OUT SOL	Off	Off	Off	
(ACT)	CV2	Off	On	On	
	SV2	Off	On*	Off	
RR LH ABS SOLENOID (ACT)	RR LH IN SOL	Off	Off	Off	
	RR LH OUT SOL	Off	Off	Off	
	CV1	Off	On	On	
_	SV1	Off	On*	Off	

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-73, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000003398547

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

• Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".

 Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10. "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.

Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u>.

>> END

INFOID:000000003247205

C1166, C1167 SV SYSTEM

< COMPONENT DIAGNOSIS >

C1166, C1167 SV SYSTEM

Description

INFOID:000000003247206

А

В

С

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

DTC Logic

INFOID:000000003247207

DTC DETECTION LOGIC

DTC	Disp	lay item	Malfund	ction detected condit	ion	Possible cause	
C1166	SV1	\ s c	/DC switch-over solution bide is open circuit of or shorted to the power	lenoid valve (SV1) o or shorted, or the con wer supply or the gro	n the primary trol line is open ound.	Harness or connector APS actuator and electric unit	D
C1167	C1167 SV2 VDC switch-over solenoid valve (SV2) on the secondary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground. (control unit)						E
DTC CC	ONFIRMATI	ON PROCEDU	JRE				BR
1.DTC	REPRODUC	TION PROCED	URE				
1. Turn 2. Perfe	the ignition orm ABS ac C1166" or "C	switch ON. tuator and electr 21167" detected	ic unit (control u	unit) self-diagnos	is.		G
YES NO	>> Proceed >> INSPEC	to diagnosis pro TION END	bcedure. Refer t	o <u>BRC-75, "Diac</u>	Inosis Proced	ure".	Η
Diagno	osis Proce	dure				INFOID:00000003398549	
1.снес	CK CONNEC	TOR					I
 Turn Disc Chee 	the ignition connect ABS ck terminal f	switch OFF. actuator and ele or deformation,	ectric unit (contr disconnection, l	ol unit) connecto ooseness, etc.	or.		J
Is the ins	spection resu	<u>ult normal?</u>					K
NO	>> GO TO 2	2. or repair dama <u>c</u>	ed parts.				
2.снес	CK SOLENO	DID, VDC SWITC	CH-OVER VALV	E AND ACTUAT	OR RELAY P	OWER SUPPLY CIRCUIT	
Check th	ne voltage be	etween ABS actu	uator and electri	ic unit (control ur	nit) harness co	onnector and ground.	L
ABS actu	uator and electr	ic unit (control unit)					M
Co	onnector	Terminal		Voltage			
	E36	1	Ground	Battery voltage			NI
Is the ins YES NO	Spection rest >> GO TO 3 >> Repair o	ult normal? 3. r replace damaç	ged parts.				N
				E AND ACTUAT			
Check th	e continuity	between ABS a	ctuator and elec	ctric unit (control	unit) harness	connector and ground.	Р
ABS actu	uator and electr	ic unit (control unit)		0			-
		- · ·		Continuity			

ABS actuator and electr	ic unit (control unit)		Continuity	
Connector	Terminal	_		
F36	13	Ground	Existed	
L30	26	Globalid		

Is the inspection result normal?

C1166, C1167 SV SYSTEM

< COMPONENT DIAGNOSIS >

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

Component Inspection

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.

Tost itom	Display itom	Display			
leschem	Display item	Up	ACT UP	ACT KEEP	
	FR RH IN SOL	Off	Off	Off	
FR RH ABS SOLENOID	FR RH OUT SOL	Off	Off	Off	
(ACT)	CV1	Off	On	On	
	SV1	Off	On*	Off	
	FR LH IN SOL	Off	Off	Off	
FR LH ABS SOLENOID (ACT)	FR LH OUT SOL	Off	Off	Off	
	CV2	Off	On	On	
	SV2	Off	On*	Off	
	RR RH IN SOL	Off	Off	Off	
RR RH ABS SOLENOID	RR RH OUT SOL	Off	Off	Off	
(ACT)	CV2	Off	On	On	
	SV2	Off	On*	Off	
RR LH ABS SOLENOID	RR LH IN SOL	Off	Off	Off	
	RR LH OUT SOL	Off	Off	Off	
(ACT)	CV1	Off	On	On	
_	SV1	Off	On*	Off	

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-75, "Diagnosis Procedure"</u>.

Special Repair Requirement

INFOID:000000003398548

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION, CALIBRATION OF YAW RATE/ SIDE/DECEL G SENSOR AND CALIBRATION OF PRESSURE SENSOR

After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.

• Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9</u>, "ADJUSTMENT OF STEERING <u>ANGLE SENSOR NEUTRAL POSITION : Description</u>".

• Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/DECEL</u> <u>G SENSOR : Description"</u>.

Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Description"</u>.

>> END

INFOID:000000003398550

< COMPONENT DIAGNOSIS >

U1000, U1002 CAN COMM CIRCUIT

Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:000000003247215

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	E
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	BRC
U1002	SYSTEM COOM	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or less.	(control unit)	G
DTC CC	NFIRMATION PROCE	DURE		
1.DTC	REPRODUCTION PROCE	DURE		Н
1. Turn 2. Perfo Is DTC "I YES NO	the ignition switch ON. form ABS actuator and elect J1000" or "U1002" detected >> Proceed to diagnosis p >> INSPECTION END	ctric unit (control unit) self-diagnosis. ed? procedure. Refer to <u>BRC-77, "Diagnosis Proced</u>	ure".	I
Diagno	sis Procedure		INFOID:00000003247216	J
1.снес	K CONNECTOR			K
1. Turn 2. Disc 3. Cheo Is the ins YES NO	the ignition switch OFF. onnect ABS actuator and ck terminal for deformation <u>pection result normal?</u> >> INSPECTION END >> Proceed to diagnosis p	electric unit (control unit) connector. n, disconnection, looseness, etc. procedure. Refer to <u>LAN-25, "CAN System Spec</u>	cification Chart".	L
Special	Repair Requiremer	ht	INFOID:00000003398551	IVI
1. ADJU SIDE/DE	STMENT OF STEERING CEL G SENSOR AND CA	ANGLE SENSOR NEUTRAL POSITION, CAL	IBRATION OF YAW RATE/	Ν
After rem cedure. • Adjustr <u>ANGLE</u> • Calibra <u>G SEN</u> • Calibra	noving/replacing an ABS a nent of steering angle se <u>SENSOR NEUTRAL PO</u> tion of yaw rate/side/dece <u>SOR : Description"</u> . tion of pressure sensor: R	actuator and electric unit (control unit), be sure the ensor neutral position: Refer to <u>BRC-9, "ADJ SITION : Description"</u> . I G sensor: Refer to <u>BRC-10, "CALIBRATION OF PRESSUR</u>	o perform the following pro- USTMENT OF STEERING OF YAW RATE/SIDE/DECEL	O

>> END

INFOID:000000003247214

А

POWER SUPPLY AND GROUND CIRCUIT

< COMPONENT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Description

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

Diagnosis Procedure

INFOID:000000003736973

INFOID:000000003736972

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 a (contr	and electric unit ol unit)	_	Voltage (Approx.)			
Connector	Terminal					
E36	20	Ground	0 V			

 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			
E36	20	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 a (contr	and electric unit ol unit)	_	Voltage			
Connector	Terminal					
E36	1	Ground	Battery voltage			

3. Turn the ignition switch ON. CAUTION:

Never start the engine.

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

ABS actuator a (contr	and electric unit ol unit)	_	Voltage
Connector	Terminal		
E36	1	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

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

BRC-78

^{1.} Turn the ignition switch OFF.

POWER SUPPLY AND GROUND CIRCUIT

< COMPONENT DIAGNOSIS >

[VDC/TCS/ABS]

ABS actuator a (contr	and electric unit ol unit)	_	Continuity
Connector	Terminal		
E26	13	Cround	Existed
E30	26	Ground	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace damaged parts.

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PARKING BRAKE SWITCH

Component Function Check

1.CHECK PARKING BRAKE SWITCH OPERATION

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

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-80, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000003247222

1.CHECK PARKING BRAKE SWITCH

Check parking brake switch. Refer to BRC-80, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace parking brake switch.

2. CHECK COMBINATION METER

Check the indication and operation of combination meter are normal. Refer to <u>MWI-33. "Diagnosis Descrip-</u>tion".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check combination meter. Refer to <u>MWI-33</u>, "Diagnosis Description".

3.CHECK PARKING BRAKE SWITCH CIRCUIT

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

Parking bi	Parking brake switch		tion meter	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E27	1	M34	26	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace damaged parts.

Component Inspection

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.

INFOID:00000003247223

INFOID:00000003247221

PARKING BRAKE SWITCH

< COMPONENT DIAGNOSIS >

Parking bi	ake switch		Condition	
Connector	Terminal		Condition	Continuity
E27	1	Ground	When the parking brake switch is operated.	Existed
E27 1 Ground When the parking brail is not operated.		When the parking brake switch is not operated.	Not existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace parking brake switch. Refer to <u>PB-6, "Exploded View"</u>.

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VDC OFF SWITCH

< COMPONENT DIAGNOSIS >

VDC OFF SWITCH

Description

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

Component Function Check

1.CHECK VDC OFF SWITCH OPERATION

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

Condition	VDC OFF indicator lamp illumination status
Press the VDC OFF switch when VDC OFF indicator lamp is OFF.	ON
Press the VDC OFF switch when VDC OFF indicator lamp is ON.	OFF
Is the inspection result normal?	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-82, "Diagnosis Procedure"</u>.

Diagnosis Procedure

1.CHECK VDC OFF SWITCH

Check VDC OFF switch. Refer to <u>BRC-83</u>, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace VDC OFF switch.

2. CHECK VDC OFF SWITCH HARNESS

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

ABS actuator and electric unit (control unit)		VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E36	22	M5	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		Continuity
E36	22	Ground	Not existed

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

VDC OFF switch			Continuity
Connector	Terminal		Continuity
M5	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

BRC-82

INFOID:000000003247224

INFOID:000000003247225

INFOID:000000003247226

VDC OFF SWITCH

< COMPONENT DIAGNOSIS >

3. CHECK COMBINATION METER				Δ
1. Connect AB	Connect ABS actuator and electric unit (control unit) connector.			
3. Check the i	 Connect VDC OFF switch connector. Check the indication and operation of combination meter are normal. Refer to <u>MWI-33, "Diagnosis</u> <u>Description"</u>. 			
Is the inspection	result normal?			
NO >> Repa	air or replace combination meter.			С
Component I	nspection		INF0ID:000000003247227	
1. CHECK VDC	OFF SWITCH			D
1. Turn the igni 2. Disconnect	tion switch OFF. /DC OFF switch connector.			E
3. Check the co	ontinuity between VDC OFF switch	connector termin	als.	
VDC OFF switch	Condition	Condition		BRC
Terminal				
1 – 2	When VDC OFF switch is hold pressed.	Existed		G
	When releasing VDC OFF switch.	Not existed		0
Is the inspection YES >> INSP NO >> Repl	<u>result normal?</u> PECTION END lace VDC OFF switch.			Н
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ABS WARNING LAMP

< COMPONENT DIAGNOSIS >

ABS WARNING LAMP

Description

INFOID:000000003247228

[VDC/TCS/ABS]

×: ON -: OFF

Condition	ABS warning lamp
Ignition switch OFF	-
For 2 seconds after turning ignition switch ON	×
2 seconds later after turning ignition switch ON	-
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:000000003247229

1.CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON. <u>Is the inspection result normal?</u>

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to <u>BRC-84, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000003247230

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 the indication and operation of combination meter are normal. Refer to <u>MWI-33, "Diagnosis Descrip-</u>tion".

Is the inspection result normal?

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

BRAKE WARNING LAMP

< COMPONENT DIAGNOSIS >

BRAKE WARNING LAMP

Description

[VDC/TCS/ABS]

INFOID:000000003247231

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	×: ON –: OFF B
Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
For 2 seconds after turning ignition switch ON	× (Note 2) C
2 seconds later after turning ignition switch ON	× (Note 2)
EBD function is malfunctioning.	× D
NOTE:	
 1: Brake warning lamp will turn on in case of parking brake ope (when brake fluid is insufficient). 	ration (when switch is ON) or of brake fluid level switch operation $\hfill \in$
• 2: After starting the engine, brake warning lamp is turned off.	
Component Function Check	INF0ID:00000003247232
1. BRAKE WARNING LAMP OPERATION CHECK 1	
Check that the lamp illuminates for approximately 2 see	conds after the ignition switch is turned ON.
Is the inspection result normal?	G
YES >> GO TO 2.	
2 proceed to diagnosis procedure. Refer to <u>1</u>	H
Z .BRAKE WARNING LAMP OPERATION CHECK 2	
Check that the brake warning lamp in the combination r ing brake pedal.	neter turns ON/OFF correctly when operating the park-
Is the inspection result normal?	
YES >> INSPECTION END	
NO >> Check parking brake switch. Refer to <u>BRC</u>	-80. Diagnosis Procedure .
Diagnosis Procedure	INFOID:00000003247233
1. CHECK PARKING BRAKE SWITCH	K
Check that the brake warning lamp in the combination r	neter turns ON/OFF correctly when operating the park-
Is the inspection result normal?	L
YES $>>$ GO TO 2.	
NO >> Check parking brake switch. Refer to BRC	-80. "Diagnosis Procedure".
2.CHECK SELF-DIAGNOSIS	
Perform ABS actuator and electric unit (control unit) se	lf-diagnosis.
Is the inspection result normal?	N
YES >> GO TO 3.	
NO >> Check items displayed by self-diagnosis.	0
3. CHECK COMBINATION METER	0
Check the indication and operation of combination metion".	eter are normal. Refer to <u>MWI-33. "Diagnosis Descrip-</u>
Is the inspection result normal?	
YES >> Replace ABS actuator and electric unit (co NO >> Repair or replace combination meter.	ntrol unit).

VDC OFF INDICATOR LAMP

< COMPONENT DIAGNOSIS >

VDC OFF INDICATOR LAMP

Description

INFOID:000000003247234

[VDC/TCS/ABS]

×:	ON	-:	0	F	F
···	0.1		\sim		

Condition	VDC OFF indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ignition switch ON	×
2 seconds later after turning ignition switch ON	_
VDC OFF switch turned ON. (VDC function is OFF.)	×
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	X

Component Function Check

INFOID:000000003247235

1.VDC OFF INDICATOR LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

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

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check VDC OFF switch. Refer to <u>BRC-82. "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:00000003247236

1.CHECK VDC OFF SWITCH

Perform the trouble diagnosis for VDC OFF switch. Refer to BRC-82. "Diagnosis Procedure".

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Check VDC OFF switch. Refer to <u>BRC-82, "Diagnosis Procedure"</u>.

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 the indication and operation of combination meter are normal. Refer to <u>MWI-33, "Diagnosis Descrip-</u> tion".

Is the inspection result normal?

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

NO >> Repair or replace combination meter.

SLIP INDICATOR LAMP

< COMPONENT DIAGNOSIS >

SLIP INDICATOR LAMP

Description

INFOID:000000003247237

	×: ON <u></u> : Blink –: OFF
Condition	SLIP indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ignition switch ON	×
2 seconds later after turning ignition switch ON	-
VDC/TCS is activated while driving.	Δ
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×
Component Function Check	INFOID:00000003247238
4	
I.CHECK SLIP INDICATOR LAMP OPERATION	
Check that the lamp illuminates for approximately 2	2 seconds after the ignition switch is turned ON.
Is the inspection result normal?	
YES >> INSPECTION END	
NO >> Proceed to diagnosis procedure. Refer	to <u>BRC-87, "Diagnosis Procedure"</u> .
Diagnosis Procedure	INF01D:00000003247239
1.CHECK SELF-DIAGNOSIS	
Perform ABS actuator and electric unit (control unit	t) self-diagnosis.
Is the inspection result normal?	, 3
YES >> GO TO 2.	
NO >> Check items displayed by self-diagnos	is.
2. CHECK COMBINATION METER	
Check the indication and operation of combination tion".	n meter are normal. Refer to MWI-33, "Diagnosis Descrip-
Is the inspection result normal?	
YES >> Replace ABS actuator and electric unit	t (control unit).
NO >> Repair or replace combination meter.	

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[VDC/TCS/ABS]

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< ECU DIAGNOSIS >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

INFOID:000000003247240

[VDC/TCS/ABS]

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

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

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
	Wheel speed	Vehicle stopped	0 [km/h (MPH)]	
FR LH SENSOR		Vehicle running (Note 1)	Nearly matches the speedometer dis- play (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
FR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
RR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
RR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer dis- play (± 10% or less)	
	Brake pedal operation	When brake pedal is depressed	On	
STOP LAWP SW		When brake pedal is not depressed	Off	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
SLCT LVR POSI	Select shift position	CVT shift position (P, R, N, D, L)	P R N D L	
		Manual mode	##	
OFE SW	VDC OFF switch ON/OFF status	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	On	
OFF SW	VDC OFF Switch ON/OFF status	VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	Off	
VAW RATE SEN	Yaw rate detected by yaw rate/side/decel sen- sor	Vehicle stopped	Approx. 0 d/s	
TAW RALE SEN		Vehicle running	-100 to 100 d/s	
	Decel G detected by yaw rate/side/decel G sensor	Vehicle stopped	Approx. 0 G	
		Vehicle running	–1.7 – +1.7 G	
	Open/Close condition of throttle valve	Accelerator pedal not depressed (Engine stopped)	0 %	
	(Linked with accelerator pedal)	Depress accelerator pedal (Engine stopped)	0 - 100 %	

< ECU DIAGNOSIS >

[VDC/TCS/ABS]

		Data monitor	
Monitor item	Display content	Condition	A Reference value in normal operation
	Transverse G detected by yaw rate/side/decel	Vehicle stopped	Approx. 0 m/s ²
SIDE G-SEINSOR	G sensor	Vehicle running	– 16.7 – 16.7 m/s ²
		Driving straight	-3.5 - +3.5°
STR ANGLE SIG	Steering angle detected by steering angle	Turn 90 ° to right	Approx. –90 ° C
		Turn 90 ° to left	Approx. +90 °
		With engine stopped	0 [tr/min (rpm)]
ENGINE SPEED	With engine running	Engine running	Almost in accor- dance with tachome- ter display
	Dealer fluid laurel avritate airmal atatus	When brake fluid level switch ON	On
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch OFF	Off
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On BR
FR RH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On
FR RH OUT SOL	Operation status of each solenoid valve	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 ("AC- TIVE TEST" with CONSULT-III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off J
FR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On
RR RH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On N
RR RH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On
RR LH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On
RR LH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off

< ECU DIAGNOSIS >

[VDC/TCS/ABS]

		Data monitor	
Monitor item Display content		Condition	Reference value in normal operation
	Motor and motor relay apprection	Ignition switch ON or engine running (ABS operated)	On
MOTOR RELAT	Motor and motor relay operation	Ignition switch ON or engine running (ABS not operated)	Off
	Actuator ralay operation	Vehicle stopped (Engine running)	On
ACTUATOR REF		Vehicle stopped (Ignition switch ON)	Off
	ABS warning lamp	When ABS warning lamp is ON	On
ABS WARN LAMP	(Note 2)	When ABS warning lamp is OFF	Off
	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	On
OFF LAMP	(Note 2)	When VDC OFF indicator lamp is OFF	Off
		When SLIP indicator lamp is ON	
SLIP LAMP	SLIP indicator lamp	When SLIP indicator lamp is blinking	On
	(Note 2)	When SLIP indicator lamp is OFF	Off
		EBD is active	On
EBD SIGNAL	EBD operation	EBD is inactive	Off
		ABS is active	On
ABS SIGNAL	ABS operation	ABS is inactive	Off
		TCS is active	On
TCS SIGNAL	TCS operation	TCS is inactive	Off
	VDC operation	VDC is active	On
VDC SIGNAL		VDC is inactive	Off
		In EBD fail-safe	On
EBD FAIL SIG	EBD fail-safe signal	EBD is normal	Off
		In ABS fail-safe	On
ABS FAIL SIG	ABS fail-safe signal	ABS is normal	Off
		In TCS fail-safe	On
TCS FAIL SIG	TCS fail-safe signal	TCS is normal	Off
		In VDC fail-safe	On
VDC FAIL SIG	VDC fail-safe signal	VDC is normal	Off
	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On
CV1		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On
CV2		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
		Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On
SV1	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off

< ECU DIAGNOSIS >

(VDC/TCS/ABS]

	Display content	Data monitor		0
Monitor item		Condition	Reference value in normal operation	- A
SV2	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC- TIVE TEST" with CONSULT-III)	On	В
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off	С
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	With ignition switch ON and brake pedal released	Approx. 0 bar	-
		With ignition switch ON and brake pedal depressed	0 – 170 bar	D
EBD WARN LAMP	Brake warning lamp (Note 2, Note 3)	When brake warning lamp is ON	On	-
		When brake warning lamp is OFF	Off	E
4WD FAIL REQ	ETS fail status	ETS fail	On	-
		ETS normal	Off	BR
2WD/4WD	Drive evie	2WD model	2WD	
		AWD model	4WD	-
NOTE:	·			G

- 1: Confirm tire pressure is normal.
- 2: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-84, "Description".
- Brake warning lamp: Refer to BRC-85, "Description".
- VDC OFF indicator lamp: Refer to BRC-86, "Description".
- SLIP indicator lamp: Refer to BRC-87, "Description".
- 3: Serves as EBD warning lamp.

Wiring Diagram -BRAKE CONTROL SYSTEM-

UP	ТО	VIN:	JN8AZ18U*9W100000,	JN8AZ18W*9W200000	(EXCEPT	FOR	MEXICO),
JN8/	AZ18l	J*9W7	10000, JN8AZ18W*9W810	0000 (FOR MEXICO)			

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INFOID:000000003247241



Revision: 2008 October

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Revision: 2008 October

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< ECU DIAGNOSIS >

[VDC/TCS/ABS]



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[VDC/TCS/ABS]



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FROM VIN: JN8AZ18U*9W100001, JN8AZ18W*9W200001 (EXCEPT FOR MEXICO), JN8AZ18U*9W710001, JN8AZ18W*9W810001 (FOR MEXICO)

JCFWM0284GE

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) < ECU DIAGNOSIS > [VDC/TCS/ABS]



< ECU DIAGNOSIS >

[VDC/TCS/ABS]



JCFWM0286GE

< ECU DIAGNOSIS >

[VDC/TCS/ABS]



JCFWM0287GE

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< ECU DIAGNOSIS >

[VDC/TCS/ABS]



JCFWM0288GE

ABS ACTUATOR AND ELECTRIC UN	NIT (CONTROL UNIT)
< ECU DIAGNOSIS >	[VDC/TCS/ABS]

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Fail-Safe

INFOID:000000003247242

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.

BRC-101

< ECU DIAGNOSIS >

[VDC/TCS/ABS]

• 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.

DTC No. Index

INFOID:000000003247243

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	
C1103	FR RH SENSOR-1	BRC-34, DTC Logic
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	
C1107	FR RH SENSOR-2	BRC-38, DTC Logic
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"
C1113	G SENSOR	BRC-46, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-49, "DTC Logic"
C1116	STOP LAMP SW	BRC-52, "DTC Logic"
C1120	FR LH IN ABS SOL	BRC-54, "DTC Logic"
C1121	FR LH OUT ABS SOL	BRC-57, "DTC Logic"
C1122	FR RH IN ABS SOL	BRC-54, "DTC Logic"
C1123	FR RH OUT ABS SOL	BRC-57, "DTC Logic"
C1124	RR LH IN ABS SOL	BRC-54, "DTC Logic"
C1125	RR LH OUT ABS SOL	BRC-57, "DTC Logic"
C1126	RR RH IN ABS SOL	BRC-54, "DTC Logic"
C1127	RR RH OUT ABS SOL	BRC-57, "DTC Logic"
C1130	ENGINE SIGNAL 1	BRC-60, "DTC Logic"
C1140	ACTUATOR RLY	BRC-62, "DTC Logic"
C1142	PRESS SEN CIRCUIT	BRC-64, "DTC Logic"
C1143	ST ANG SEN CIRCUIT	BRC-66, "DTC Logic"
C1144	ST ANG SEN SIGNAL	BRC-68, "DTC Logic"
C1145	YAW RATE SENSOR	BRC-46 "DTC Logic"
C1146	SIDE G-SEN CIRCUIT	
C1155	BR FLUID LEVEL LOW	BRC-69, "DTC Logic"
C1160	DECEL G SEN SET	BRC-71 "DTC Logic"
C1161	SIDE G SEN SET	<u>BRO FI, BTO Logio</u>

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

< ECU DIAGNOSIS >

DTC	Items (CONSULT screen terms)	Reference	
C1162	PRESS SEN SET	BRC-72, "DTC Logic"	A
C1164	CV1	PPC 72 "DTC Logio"	
C1165	CV2	BRC-73, "DTC Logic"	В
C1166	SV1	PPC 75 "DTC Logio"	
C1167	SV2	BRC-75, DTC LOgic	
C1170	VARIANT CODING	BRC-43, "DTC Logic"	С
U1000	CAN COMM CIRCUIT	PPC 77 "DTC Logio"	
U1002	SYSTEM COMM (CAN)	BRC-11, DTC LOGIC	D

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EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:000000003247244

1.CHECK START

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

YES >> GO TO 2.

NO >> Check brake system.

2. CHECK FRONT AND REAR AXLE

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

- Front
- 2WD models: Refer to FAX-8, "Inspection".
- AWD models: Refer to FAX-35, "Inspection".
- Rear
- 2WD models: Refer to <u>RAX-4, "Inspection"</u>.

- AWD models: Refer to RAX-11, "Inspection"

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

 $\mathbf{3}.$ 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

>> Check brake system.

NO

UNEXPECTED PEDAL REACTION А **Diagnosis Procedure** INFOID:00000003247245 **1.**CHECK BRAKE PEDAL STROKE В Check brake pedal stroke. Refer to BR-9, "Inspection and Adjustment". Is the stroke too large? С YES >> • Bleed air from brake tube and hose. Refer to BR-13, "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-9, "Inspection and Adjustment". D - Brake master cylinder: Refer to BR-14, "Inspection". - Brake booster: Refer to BR-15, "Inspection". NO >> GO TO 2. Е 2. CHECK FUNCTION Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. Check if braking force is BRC normal in this condition. Connect connector after inspection. Is the inspection result normal? YES >> Normal

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THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:000000003247246

[VDC/TCS/ABS]

CAUTION:

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

1.CHECK FUNCTION

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

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >	[VDC/TCS/ABS]	
ABS FUNCTION DOES NOT OPERATE		٨
Diagnosis Procedure	INFOID:000000003247247	A
CAUTION: ABS does not operate when speed is 10 km/h (6 MPH) or lower. 1.CHECK ABS WARNING LAMP DISPLAY		В
Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when	n driving.	С
<u>Is the inspection result normal?</u> YES >> Normal NO >> Perform self-diagnosis.		D

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PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

< SYMPTOM DIAGNOSIS >

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

INFOID:000000003247248

[VDC/TCS/ABS]

CAUTION:

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

- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]
- **1.**SYMPTOM CHECK 1

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

Do vibrations occur?

YES >> GO TO 2.

NO >> Inspect the brake pedal.

2.SYMPTOM CHECK 2

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

Do the operation noises occur?

YES >> GO TO 3.

NO >> Perform self-diagnosis.

3.SYMPTOM CHECK 3

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

Do symptoms occur?

- YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.
- NO >> Normal
| VEHICLE JERKS DURING VDC/TCS/ABS CONTROL | |
|---|-----|
| < SYMPTOM DIAGNOSIS > [VDC/TCS/ABS] | |
| VEHICLE JERKS DURING VDC/TCS/ABS CONTROL | Λ |
| Diagnosis Procedure | A |
| 1. SYMPTOM CHECK | В |
| Check if the vehicle jerks during VDC/TCS/ABS control. | |
| Is the inspection result normal? | C |
| YES >> Normal.
NO >> GO TO 2. | 0 |
| 2. CHECK SELF-DIAGNOSIS RESULTS | D |
| Perform self-diagnostic of ABS actuator and electric unit (control unit). | D |
| <u>Are self-diagnosis results indicated?</u> YES >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis. NO >> GO TO 3. | E |
| 3. CHECK CONNECTOR | BRC |
| Turn the 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. | G |
| Are self-diagnosis results indicated? | |
| YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. | Н |
| 4. CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS | |
| Perform ECM self-diagnosis and TCM self-diagnosis. | |
| Are self-diagnosis results indicated? | |
| YES >> Check the corresponding items. ECM: Refer to <u>EC-102, "Diagnosis Description"</u>. TCM: Refer to TM-32, "Diagnosis Description". | J |
| NO >> Replace ABS actuator and electric unit (control unit). | |
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< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.	This is a normal condi- tion 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 op- eration check.	
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because	
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	rucs places the highest priority on the optimum traction (stability).	
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 con- dition 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 dur- ing 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 be- fore performing an in- spection on a chassis dynamometer.)	

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< PRECAUTION > PRECAUTION PRECAUTIONS FOR USA AND CANADA

FOR USA AND CANADA : Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" INFOID:000000004790234

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 BRC 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".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors while ignition switch is ON or engine is running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration may activate the sensor(s), deploy the airbag(s), possibly cause serious injury. When using air or electric power tools or hammers, always turn OFF ignition switch, disconnect the battery, and wait 3 minutes or more before performing any service.

FOR USA AND CANADA : Precaution for Procedure without Cowl Top Cover



FOR USA AND CANADA : Precaution for Brake System

WARNING:

Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Only use "DOT 3" brake fluid. Refer to <u>MA-15, "FOR NORTH AMERICA : Fluids and Lubricants"</u>.
- Never reuse drained brake fluid.

the lower end of windshield with urethane, etc.

- 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 to clean. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.

PRECAUTIONS

< PRECAUTION >

[VDC/TCS/ABS]

- Tighten the brake tube flare nut to the specified torque with crowfoot (A) and torque wrench (B).
- Always confirm the specified tightening torque when installing the brake pipes.
- 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.
- Check that no brake fluid leakage is present after replacing the parts.



FOR USA AND CANADA : Precaution for Brake Control

INFOID:000000003247254

- 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: Suspensionrelated 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.

FOR MEXICO

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

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

Information necessary to service the system safely is included in the "SRS 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".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors while ignition switch is ON or engine is running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration may activate the sensor(s), deploy the airbag(s), possibly cause serious injury.

When using air or electric power tools or hammers, always turn OFF ignition switch, disconnect the battery, and wait 3 minutes or more before performing any service.

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• 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: Suspensionrelated 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.

WARNING:

< PRECAUTION >

Clean any dust from the front brake and rear brake with a vacuum dust collector. Never blow with compressed air.

CAUTION:

- Only use "DOT 3" brake fluid. Refer to <u>MA-16, "FOR MEXICO : Fluids and Lubricants"</u>.
- 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 to clean. 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

FOR MEXICO : Precaution for Brake System

- crowfoot (A) and torque wrench (B).
 Always confirm the specified tightening torque when installing the brake pipes.
- 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.
- Check that no brake fluid leakage is present after replacing the parts.

FOR MEXICO : Precaution for Brake Control

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

FOR MEXICO : Precaution for Procedure without Cowl Top Cover

PRECAUTIONS

Revision: 2008 October

BRC-113

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collector. Never blow with comBRC
and Lubricants".
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[VDC/TCS/ABS]



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ON-VEHICLE REPAIR WHEEL SENSOR

FRONT WHEEL SENSOR

FRONT WHEEL SENSOR : Exploded View

INFOID:000000003247255



- 1. Front LH wheel sensor connector 2. Front LH wheel sensor
- B. White line (slant line)
- ∠ : Vehicle front

Refer to <u>GI-4, "Components"</u> for symbol in the figure.

NOTE:

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

FRONT WHEEL SENSOR : Removal and Installation

INFOID:00000003247256

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

INSTALLATION

Be careful with the following when installing wheel sensor. Tighten installation bolts to the specified torques.

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

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WHEEL SENSOR

< ON-VEHICLE REPAIR >

• 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.

REAR WHEEL SENSOR

REAR WHEEL SENSOR : Exploded View

INFOID:00000003247257 B

[VDC/TCS/ABS]



- 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.

- 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.

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FRONT SENSOR ROTOR : Removal and Installation

Refer to FAX-10, "Exploded View" (2WD models), FAX-37, "Exploded View" (AWD models).

REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to FAX-10, "Removal and Installation" (2WD models), FAX-37, "Removal and Installation" (AWD models).

INSTALLATION

< ON-VEHICLE REPAIR > SENSOR ROTOR

FRONT SENSOR ROTOR

Sensor rotor cannot be disassembled. Install the sensor rotor together with hub bearing assembly. Refer to FAX-10, "Removal and Installation" (2WD models), FAX-37, "Removal and Installation" (AWD models). REAR SENSOR ROTOR

REAR SENSOR ROTOR : Exploded View

FRONT SENSOR ROTOR : Exploded View

Refer to RAX-5, "Exploded View" (2WD models), RAX-13, "Exploded View" (AWD models).

REAR SENSOR ROTOR : Removal and Installation

REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to RAX-5, "Removal and Installation" (2WD models), RAX-15, "Removal and Installation" (AWD models).

INSTALLATION

Sensor rotor cannot be disassembled. Install the sensor rotor together with hub bearing assembly. Refer to RAX-5, "Removal and Installation" (2WD models), RAX-15, "Removal and Installation" (AWD models).

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INFOID:000000003247259

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ON-VEHICLE REPAIR >

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View

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[VDC/TCS/ABS]



- Remove ABS actuator and electric unit (control unit) bracket mounting nut. 4.
- 5. Remove ABS actuator and electric unit (control unit) from vehicle.

INSTALLATION

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

CAUTION:

1.

2.

Before servicing, disconnect the battery cable from negative terminal.

BRC-117

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ON-VEHICLE REPAIR >

- 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-13, "Bleeding Brake System".
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked.
- After removing/replacing an ABS actuator and electric unit (control unit), be sure to perform the following procedure.
- Adjustment of steering angle sensor neutral position: Refer to <u>BRC-9, "ADJUSTMENT OF STEERING</u> <u>ANGLE SENSOR NEUTRAL POSITION : Description"</u>.
- Calibration of yaw rate/side/decel G sensor: Refer to <u>BRC-10, "CALIBRATION OF YAW RATE/SIDE/</u> <u>DECEL G SENSOR : Description"</u>.
- Calibration of pressure sensor: Refer to <u>BRC-11, "CALIBRATION OF PRESSURE SENSOR : Descrip-</u> tion".

Install ABS actuator and electric unit (control unit) as per the following steps.

- 1. Temporarily tighten mounting bolt (1) because the bracket (2) is temporarily being hold.
- 2. Tighten mounting bolt (3) while holding the bracket.
- 3. Tighten mounting bolts to the specified torque in the order of (4), (1).



G SENSOR

Exploded View

[VDC/TCS/ABS]

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side/decel G sensor is sensitive to the impact.

Ν After work, make sure to calibration of yaw rate/side/decel G sensor. Refer to <u>BRC-10, "CALIBRA-</u> TION OF YAW RATE/SIDE/DECEL G SENSOR : Description".

1.

2.

3.

4.

STEERING ANGLE SENSOR

< ON-VEHICLE REPAIR >

STEERING ANGLE SENSOR

Exploded View

INFOID:000000003247267

[VDC/TCS/ABS]



- 1. Steering angle sensor
- C: Vehicle front

Removal and Installation

INFOID:000000003247268

REMOVAL

- 1. Remove spiral cable assembly. Refer to <u>SR-8, "Exploded View"</u>.
- 2. Remove steering angle sensor from spiral cable assembly.

INSTALLATION

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

CAUTION:

After work, make sure to adjust neutral position of steering angle sensor. Refer to <u>BRC-9, "ADJUST-MENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description"</u>.