STEERING CONTROL SYSTEM

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4WAS FRONT CONTROL UNIT	
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< BASIC INSPECTION >

BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

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DETAILED FLOW

1.COLLECT THE INFORMATION FROM THE CUSTOMER

It is also important to clarify customer complaints before inspection. First of all, reproduce symptoms, and understand them fully. Ask customer about his/her complaints carefully. In some cases, it is necessary to check symptoms by driving vehicle with customer.

CAUTION:

Customers are not professional. It is dangerous to make an easy guess like "maybe the customer means that...," or "maybe the customer mentions this symptom".

>> GO TO 2.

2. CHECK THE STATUS

- 1. Power steering fluid leakage and check the power steering fluid level. Refer to <u>ST-10, "Inspection"</u>.
- 2. Check the drive belt tension. Refer to EM-12. "Checking".
- 3. Check the power steering gear for damages, cracks and fluid leakage. Refer to ST-10, "Inspection".
- 4. Check the relief oil pressure. Refer to <u>ST-32, "Inspection"</u>.

>> GO TO 3.

3. DIAGNOSIS CHART BY SYMPTOM

Perform the diagnosis by symptom. Refer to STC-22, "Diagnosis Procedure".

>> GO TO 4.

4.FINAL CHECK

Check the input/output standard values for the power steering control unit.

Are the power steering control unit input/output values within standard ranges respectively?

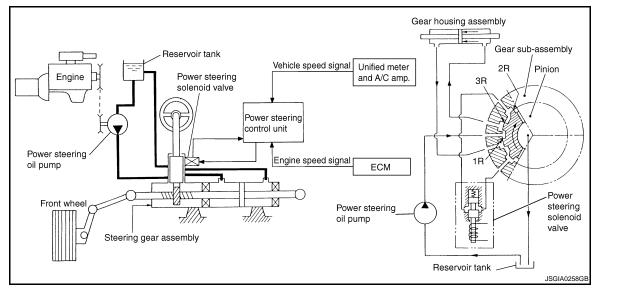
YES >> INSPECTION END

NO >> GO TO 2.

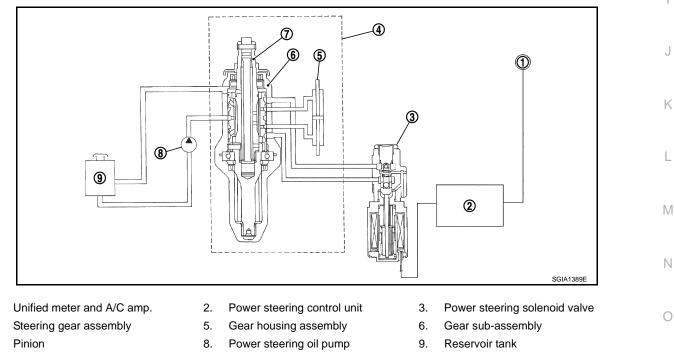
FUNCTION DIAGNOSIS EPS SYSTEM

System Diagram

CONTROL DIAGRAM



CROSS-SECTIONAL VIEW



System Description

1.

4. 7.

• The EPS system controls the power steering solenoid valve through the power steering control unit.

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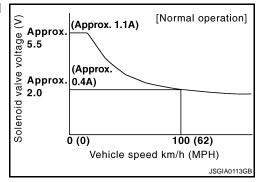
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EPS SYSTEM

< FUNCTION DIAGNOSIS >

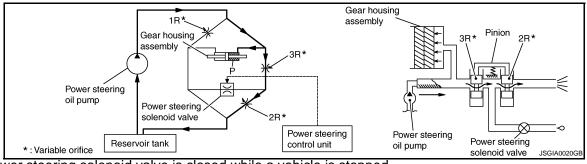
[WITHOUT 4WAS]

• The valve driving voltage to control the power steering solenoid valve varies according to the vehicle speed.



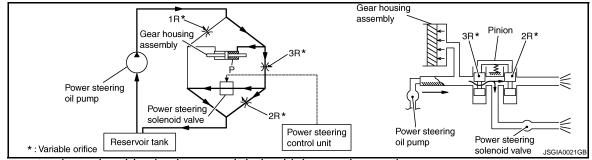
OPERATION PRINCIPLE

During Parking (When Turning The Steering Wheel To The Right.)



- 1. Power steering solenoid valve is closed while a vehicle is stopped.
- 2. Pinion "1R", "2R" and "3R" are closed depending on steering torque of steering wheel.
- 3. Oil pressure "P" in the gear housing assembly is the sum of oil pressures occurred in "2R" and "3R". This results in a light steering force because of high pressure.

During High-speed Operation



- 1. Power steering solenoid valve is opened during high-speed operation.
- 2. Pinion "1R", "2R" and "3R" are closed depending on steering torque of steering wheel.
- 3. Oil pressure "2R" does not occur because the power steering solenoid valve is on full throttle.
- 4. Oil pressure "P" in the gear housing assembly includes only oil pressure occurred in "3R" and results in a heavy steering force.

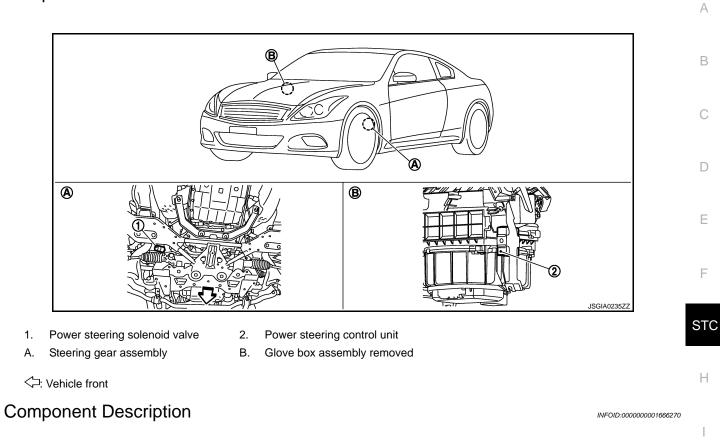
EPS SYSTEM

< FUNCTION DIAGNOSIS >

Component Parts Location

[WITHOUT 4WAS]

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Component parts	Reference/Function		
Power steering control unit	 Signals from various sensors control the driving voltage to the power steering solenoid valve. The power steering control unit controls the driving voltage to the power steering solenoid valve for maintaining the power steering assist force when the fail-safe function is activated. (The engine speed signals control EPS system if any vehicle speed signal error is detected.) 		
Unified meter and A/C amp.	STC-15, "Description"		
ECM	STC-13, "Description"		
Power steering solenoid valve	STC-11, "Description"		

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COMPONENT DIAGNOSIS POWER SUPPLY AND GROUND CIRCUIT

Description

• Power supply to EPS system

Diagnosis Procedure

1.CHECK POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect power steering control unit harness connector.
- 3. Check voltage between power steering control unit harness connector and ground.

Pov	ver steering control unit	Voltage (Approx.)
Connector	Terminal	Vollage (Applox.)
M108	3 – Ground	0 V

4. Turn the ignition switch ON.

CAUTION: Never start the engine.

5. Check voltage between power steering control unit harness connector and ground.

Pov	ver steering control unit	Voltage (Approx.)
Connector	Terminal	vollage (Applox.)
M108	3 – Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2. NO >> Check th

- >> Check the following. If any items are damaged, repair or replace damaged parts.
 - 10A fuses (#45) open
 - Harness for short or open between ignition switch and power steering control unit harness connector No. 3 terminal.
 - Ignition switch. Refer to SEC-61, "Component Inspection".

2. CHECK GROUND CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check continuity between power steering control unit harness connector and ground.

	Continuity	
Connector	Terminal	Continuity
M108	6 – Ground	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to power in harness or connectors.

 $\mathbf{3}$. CHECK TERMINALS AND HARNESS CONNECTORS

Check power steering control unit pin terminals for damage or loose connection with harness connector. <u>Is the inspection result normal?</u>

YES >> INSPECTION END

NO >> Repair or replace damaged parts.

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POWER STEERING SOLENOID VALVE

< COMPONENT DIAGNOSIS >

POWER STEERING SOLENOID VALVE

Description

Power steering solenoid valve controls the power steering oil pressure in the gear housing assembly.

Diagnosis Procedure

1.CHECK POWER STEERING SOLENOID VALVE SIGNAL

1. Turn the ignition switch OFF.

2. Check signal between power steering control unit harness connector and ground.

	Value (Approx.)			
Connector	Connector Terminal Condition			
M108 1 –	M108 1 – Ground	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	4.4 – 6.6 V	
		Vehicle speed: 100 km/h (62 MPH)	2.4 – 3.6 V	

Is the inspection result normal?

YES >> GO TO 2. NO >> GO TO 4.

2.CHECK HARNESS BETWEEN POWER STEERING SOLENOID VALVE AND POWER STEERING CON-

- 1. Turn the ignition switch OFF.
- 2. Disconnect power steering solenoid valve harness connector.
- 3. Disconnect power steering control unit harness connector.
- 4. Check the continuity between power steering solenoid valve harness connector and the power steering control unit harness connector.

	ring solenoid Ive	Power steerir	ng control unit	Continuity
Connector	Terminal	Connector	Terminal	
F45	1	M108	1	Existed
F45	2	M108	5	Existed

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

 $\mathbf{3}$. Check power steering solenoid value

1. Check resistance between power steering solenoid valve connector terminals.

Power steering solenoid valve		Resistance (Approx.)	
Connector	Terminal		
F45	1 – 2	4-6 Ω	

2. Check power steering solenoid valve connector by listening for its operation sound while applying battery voltage to power steering solenoid valve connector F45 terminals 1 (positive) and 2 (negative).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace gear-sub assembly. Refer to <u>ST-26, "Exploded View"</u>.

4.CHECK TERMINALS AND HARNESS CONNECTORS

Check power steering control unit pin terminals for damage or loose connection with harness connector.

STC-11

[WITHOUT 4WAS]

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POWER STEERING SOLENOID VALVE

< COMPONENT DIAGNOSIS >

<u>Is the inspection result normal?</u> YES >> INSPECTION END

NO >> Repair or replace damaged parts.

Component Inspection

INFOID:000000001666275

1.CHECK POWER STEERING SOLENOID VALVE

- 1. Turn the ignition switch OFF.
- 2. Disconnect power steering solenoid valve harness connector.
- 3. Check resistance between power steering solenoid valve connector terminals.

Powe	er steering solenoid valve	Resistance (Approx.)
Connector	Terminal	Resistance (Approx.)
F45	1 – 2	4 – 6 Ω

4. Check power steering solenoid valve connector by listening for its operation sound while applying battery voltage to power steering solenoid valve connector F45 terminals 1 (positive) and 2 (negative).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace gear-sub assembly. Refer to <u>ST-26, "Exploded View"</u>.

ENGINE SPEED SIGNAL CIRCUIT

			ED SIGNAL CIRCUIT [WITHOUT 4WAS]
		SIGNAL CIRCUI	
Descriptio	on		/ INFOID:000000001666276
-		ed signal to power steer	ing control unit
	s Procedure	- .	
			INFOID:000000001666277
-		-DIAGNOSIS	(
With CON Perform EC	NSULT-III M self-diagno:	sis.	
<u>Is any error</u>	system detect	ted?	
	Check the err GO TO 2.	or system.	
•		TWEEN ECM AND PO	WER STEERING CONTROL UNIT
-	e ignition swite		
		ness connectors. ering control unit harne	es connector
			nector and power steering control unit harness connector.
	014	D	S
Connector	CM Terminal	Power steering control unit Connector Terminal	Continuity
M107	110	M108 10	Existed
		or short to ground and s	
Is the inspec	ction result no	rmal?	
	GO TO 3. Repair or repl	ace damaged parts.	
•	-	ED SIGNAL (1)	
	e ignition swite	. ,	
2. Connec	t ECM harnes	s connectors.	
3. Check s	signal betweer	TECM namess connect	or and ground with oscilloscope.
		ECM	Value (Approx.)
Connector	Terminal	Condition	
			(V)
			6 ·····
		Engine speed: At idle (Warm-up condition)	
			0 ⊢lt==lt==lt==lt==lt==lt== ====== 20ms
1407	140 Oracia d		PBIA3654J
M107	110 – Ground		
		Engine speed: Approx. 2,00 (Warm-up condition)	
			20ms
Also ch	eck harness fo	or short to ground and s	

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

ENGINE SPEED SIGNAL CIRCUIT

< COMPONENT DIAGNOSIS >

NO >> Replace ECM. Refer to <u>EC-16. "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT</u> (ECM) : Description".

4.CHECK ENGINE SPEED SIGNAL (2)

- 1. Turn the ignition switch OFF.
- 2. Connect power steering control unit harness connector.
- 3. Check signal between power steering control unit harness connector and ground with oscilloscope.

	Power ste	Value (Approx.)	
Connector	Terminal	Condition	
M108 10 – Ground	Engine speed: At idle (Warm-up condition)	(V) 6 4 2 0 20ms PBIA3664J	
WITCO	io – Giouna	Engine speed: Approx. 2,000 rpm (Warm-up condition)	(V) 6 4 2 0

Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace power steering control unit. Refer to <u>STC-24, "Exploded View"</u>.

5.CHECK TERMINALS AND HARNESS CONNECTORS

• Check power steering control unit pin terminals for damage or loose connection with harness connector.

Check ECM pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace damaged parts.

VEHICLE SPEED SIGNAL CIRCUIT

< COMPON			ED SIGNAL CIRCUIT [WITHOUT 4WAS]
		D SIGNAL CIRCL	
Descriptio	n		INF0ID:00000001666278
		amp_sends vehicle spec	ed signal to power steering control unit.
Diagnosis			INFOID:000000001666279
4		METER AND A/C AMP.	
_		METER AND A/C AMP.	SELF-DIAGNOSIS
With CON Perform unit		nd A/C amp. self-diagnos	sis.
ls any error s	•		
	Check the e GO TO 2.	rror system.	
2.снеск н	HARNESS E	BETWEEN UNIFIED ME	TER AND A/C AMP. AND POWER STEERING CONTROL
	e ignition swi ect unified n	tch OFF. neter and A/C amp. harn	ess connector.
3. Disconn	ect power st	eering control unit harne	ss connector.
	continuity be connector.	ween unified meter and	A/C amp. harness connector and power steering control unit
11	and 6 (0	Device et al.	
Unified meter Connector	and A/C amp. Terminal	Power steering control unit Connector Terminal	Continuity
M66	8	M108 8	Existed
Also che	eck harness	for short to ground and s	hort to power.
Is the inspec		ormal?	
	GO TO 3. Repair or re	place damaged parts.	
~	-	PEED SIGNAL (1)	
	ignition swi		
		er and A/C amp. harness	s connector. out standard values. Refer to <u>MWI-69, "Reference Value"</u> .
Is the inspec			
	GO TO 4.		
4	•	PEED SIGNAL (2)	Refer to <u>MWI-160, "Exploded View"</u> .
	ignition swi		
2. Connect	t power stee	ring control unit harness	
3. Check s	ignal betwee	en power steering contro	l unit harness connector and ground with oscilloscope.
	Power st	eering control unit	
Connector	Terminal	Condition	
		Vehicle speed:	
M108	8 – Ground	40 km/h (25 MPH) CAUTION:	
		Check air pressure of tire u standard condition.	
Also che	eck harness	standard condition. for short to ground and s	hort to power.

VEHICLE SPEED SIGNAL CIRCUIT

< COMPONENT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace power steering control unit. Refer to STC-24, "Exploded View".

5. CHECK TERMINALS AND HARNESS CONNECTORS

Check power steering control unit pin terminals for damage or loose connection with harness connector.
Check unified meter and A/C amp. pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

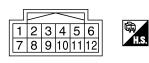
>> INSPECTION END YES

NO >> Repair or replace damaged parts.

ECU DIAGNOSIS POWER STEERING CONTROL UNIT

Reference Value

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No.		\\/ire	Description			
+	-	Wire color	Signal name	Input/ Output	Condition	Value (Approx.)
1	Ground	LG	Power steering so- lenoid valve voltage	Output	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	4.4 – 6.6 V
					Vehicle speed: 100 km/h (62 MPH)	2.4 – 3.6 V
3	Ground	G	Ignition switch pow- er supply	Input	Ignition switch: ON	Battery voltage
					Ignition switch: OFF	0 V
5	Ground	В	Power steering so- lenoid valve ground	_	Always	0 V
6	Ground	В	Ground	_	Always	0 V
8	Ground	L	Vehicle speed sig- nal	Input	Vehicle speed: 40 km/h (25 MPH) CAUTION: Check air pressure of tire under standard condition.	(V) 6 4 2 0 • • • 70 ms SEIA0775E
10	Ground	R	Engine speed signal	Input -	Engine speed: At idle (Warm-up condition)	(V) 6 4 0 2 0 2 0 2 0 5 2 0 9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
					Engine speed: Approx. 2,000 rpm (Warm-up condition)	(V) 6 4 2 0 20ms PBIA3655J

CAUTION:

JSGIA0023ZZ

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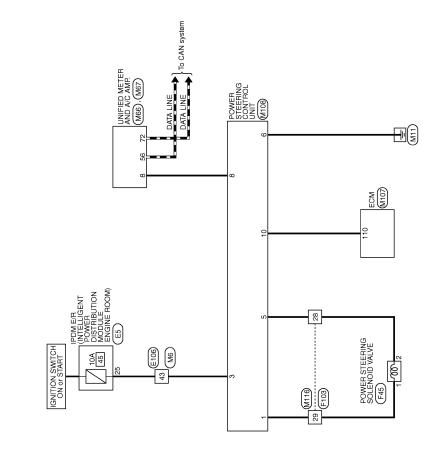
< ECU DIAGNOSIS >

[WITHOUT 4WAS]

When using circuit tester or oscilloscope to measure voltage for inspection, be sure not to forcibly extend any connector terminals.

Wiring Diagram - ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM -

Click here to view the eWD.



2007/05/18

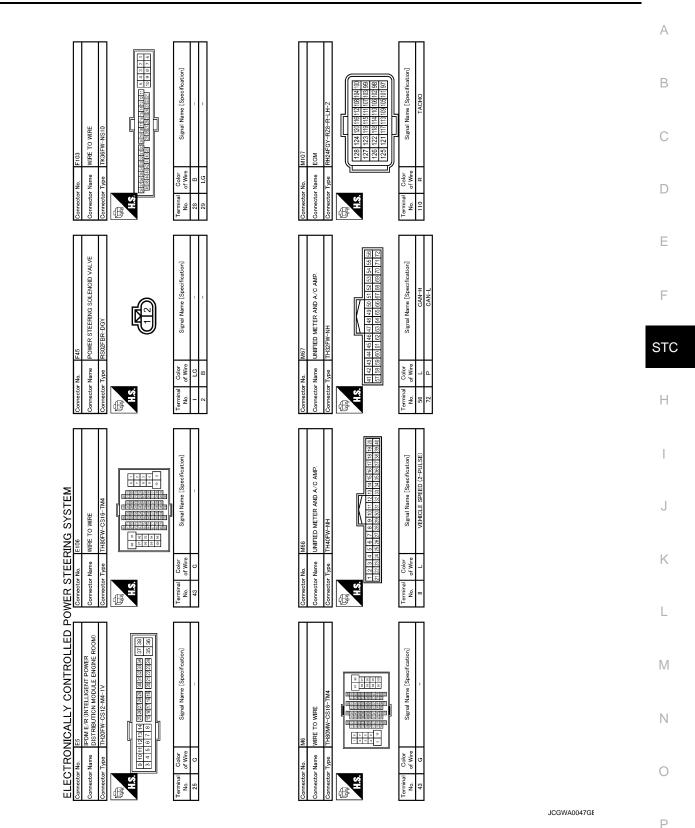
JCGWA0046GE

ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

< ECU DIAGNOSIS >

POWER STEERING CONTROL UNIT

[WITHOUT 4WAS]



POWER STEERING CONTROL UNIT

 ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

 connector Name
 MI08

 connector Name
 POWER STEERING SYSTEM

 connector Type
 MI16

 connector Type
 Tradameter Name

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 1

 fig
 Signal Name [Specification]

 no
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 no
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 signal Name [Specification]
 Point

Fail Safe

EPS system

< ECU DIAGNOSIS >

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INFOID:000000001666282

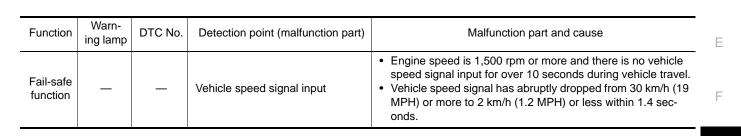
POWER STEERING CONTROL UNIT

< ECU DIAGNOSIS >

• EPS system enters the fail-safe mode (that allows the steering force to be controlled without impairing the drive ability) if any of the input/output values to/from EPS system (power steering control unit) deviate from the standard range.

The system enters the fail-safe mode if the engine speed remains at 1,500 rpm or more for over 10 seconds while the vehicle is stopped. This is normal.

 The fail-safe function is canceled when a vehicle speed signal of 2 km/h (1.2 MPH) or more is inputted or the key switch is turned OFF→ON. EPS system restores the normal operation at that time.





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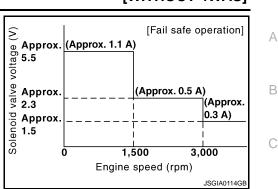
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[[]WITHOUT 4WAS]

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION) < SYMPTOM DIAGNOSIS > [WITHOUT 4WAS]

SYMPTOM DIAGNOSIS

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIA-TION)

Description

INFOID:000000001666283

- Hard steering when fully turning the steering wheel.
- Light steering when driving at a high speed.

Diagnosis Procedure

INFOID:000000001666284

1.CHECK SYSTEM FOR POWER SUPPLY AND GROUND

Perform trouble diagnosis for power supply and ground. Refer to <u>STC-10, "Diagnosis Procedure"</u>. Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2.CHECK SYSTEM FOR VEHICLE SPEED SIGNAL

Perform trouble diagnosis for vehicle speed signal. Refer to STC-15, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

 $\mathbf{3.}$ CHECK SYSTEM FOR ENGINE SPEED SIGNAL

Perform trouble diagnosis for engine speed signal. Refer to STC-13, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace damaged parts.

4.CHECK SYSTEM FOR POWER STEERING SOLENOID VALVE

Perform trouble diagnosis for power steering solenoid valve. Refer to <u>STC-11, "Diagnosis Procedure"</u>. Is the inspection result normal?

- YES >> Perform the symptom diagnosis for the steering system. Refer to <u>ST-3, "NVH Troubleshooting</u> <u>Chart"</u>.
- NO >> Repair or replace damaged parts.

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INFOID:000000001751538

< PRECAUTION > PRECAUTION PRECAUTIONS

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

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

WARNING:

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

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

NOTE:

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

This vehicle is equipped with a push-button ignition switch and a steering lock unit.

If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.

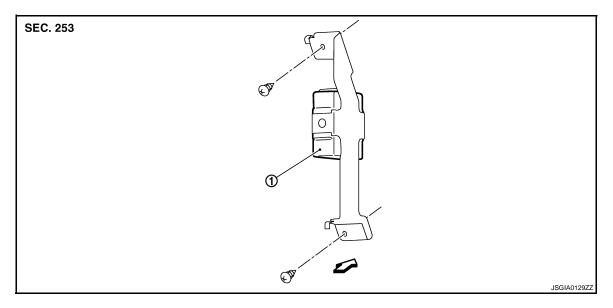
NOTE:

Supply power using jumper cables if battery is discharged.

- 2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
- 3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
- 4. Perform the necessary repair operation.
- 5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
- 6. Perform self-diagnosis check of all control units using CONSULT-III.

ON-VEHICLE REPAIR POWER STEERING CONTROL UNIT

INFOID:000000001666287



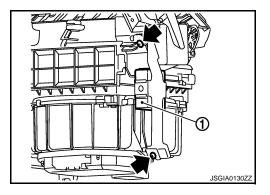
1. Power steering control unit

C: Vehicle front

Removal and Installation

REMOVAL

- 1. Remove glove box assembly. Refer to IP-11, "Exploded View".
- 2. Remove power steering control unit screws.
- 3. Remove power steering control unit (1).
- 4. Disconnect power steering control unit connector.



INSTALLATION Install in the reverse order of removal. INFOID:000000001666288

BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW Work Flow INFOID:000000001666289 DETAILED FLOW 1.INTERVIEW FROM THE CUSTOMER It is also important to clarify customer complaints before inspection. First of all, reproduce symptoms, and understand them fully. Ask customer about his/her complaints carefully. In some cases, it is necessary to check symptoms by driving vehicle with customer. CAUTION: Customers are not professional. It is dangerous to make an easy guess like "maybe the customer means that...," or "maybe the customer mentions this symptom". >> GO TO 2. 2.CHECK SYMPTOM Start the engine. **CAUTION:** Stop the vehicle. Does 4WAS warning lamp turn ON? YES >> GO TO 3. NO >> GO TO 6. **3.** PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT) (P)With CONSULT-III Perform 4WAS main control unit self-diagnosis. Is any DTC detected other than "C1930" or "C1931"? YES >> GO TO 4. NO >> GO TO 5. ${f 4.}$ PERFORM TROUBLE DIAGNOSIS (4WAS MAIN CONTROL UNIT) (P)With CONSULT-III Check the error system detected from the self-diagnosis. CAUTION: Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Erase 4WAS main control unit self-diagnosis memory. CAUTION: • Never erase the self-diagnosis result (record) history when replacing 4WAS main control unit. Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR". >> GO TO 5. **5.** PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT AND 4WAS MAIN CONTROL UNIT) With CONSULT-III 1. Perform 4WAS front control unit self-diagnosis. 2. Check the error system detected from the self-diagnosis. CAUTION: Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. 3. Erase 4WAS front control unit self-diagnosis memory.

CAUTION:

< BASIC INSPECTION >

- Never erase the self-diagnosis result (record) history when replacing 4WAS front control unit.
- Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".
- 4. Perform 4WAS main control unit self-diagnosis.

[WITH 4WAS]

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< BASIC INSPECTION >

- 5. Check the error system detected from the self-diagnosis.
 - Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function.
- 6. Erase 4WAS main control unit self-diagnosis memory. CAUTION:
 - Never erase the self-diagnosis result (record) history when replacing 4WAS main control unit.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

>> GO TO 6.

6.CHECK TERMINAL

Check each harness connector pin terminal for disconnection.

>> GO TO 7.

7. CHECK SYMPTOM REPRODUCTION

With CONSULT-III

Perform DTC reproduction procedure for the error system.

Is any error system detected?

YES >> GO TO 2. NO >> GO TO 8.

8.PERFORM SYMPTOM DIAGNOSIS

With CONSULT-III

Perform the symptom diagnosis for each system.

Is any error detected?

YES >> GO TO 2. NO >> GO TO 9.

9.FINAL CHECK

With CONSULT-III

Check input/output signal standard of 4WAS front control unit and 4WAS main control unit.

Is the input/output the standard value?

YES >> INSPECTION END NO >> GO TO 2.

INSPECTION AND ADJUSTMENT	
< BASIC INSPECTION > [WITH 4WAS]	
INSPECTION AND ADJUSTMENT	
ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT	А
ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description	В
 Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Perform 4WAS front actuator adjustment when performing any service below. 4WAS front actuator and the steering components (including wheel alignment) removal. Refer to <u>STC-27.</u> <u>"4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 1)".</u> 	С
• Check the following items before the removal:	D
 4WAS warning lamp is turned OFF after the engine starts. Self-diagnosis of each control unit of 4WAS system (4WAS front control unit/4WAS main control unit) is performed. Check that 4WAS system is controlled properly. 	E
- 4WAS front actuator and the steering components (including wheel alignment) installation. Refer to <u>STC-28</u> , <u>"4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern</u>	_
 <u>2)"</u>. <u>4WAS</u> front control unit and the steering angle sensor replacement. Refer to <u>STC-28</u>, "<u>4WAS FRONT</u> <u>ACTUATOR NEUTRAL POSITION ADJUSTMENT</u>: <u>Special Repair Requirement (Pattern 3)</u>". When driving while misaligning the steering wheel position (center) after installing 4WAS front actuator. Refer to <u>STC-30</u>, "<u>4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT</u>: <u>Special Repair</u> 	F
Requirement (Pattern 4)". 4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT	
4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Description	Η
 Perform 4WAS front actuator adjustment when performing any service below. 4WAS front actuator and the steering components (including wheel alignment) removal. Refer to <u>STC-27</u>. <u>"4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 1)"</u>. <u>CAUTION:</u> 	l J
 Check the following items before the removal: 4WAS warning lamp OFF after the engine starts. Self-diagnosis of each control unit of 4WAS system (4WAS front control unit/4WAS main control unit) is performed. Check that 4WAS system controlled properly. 4WAS front actuator and the steering components (including wheel alignment) installation. Refer to <u>STC-28</u>. 	K
<u>"4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern</u> 2)".	L
 - 4WAS front control unit and the steering angle sensor replacement. Refer to <u>STC-28</u>, "4WAS FRONT <u>ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)</u>". - When driving while misaligning the steering wheel position (center) after installing 4WAS front actuator. Refer to <u>STC-30</u>, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair <u>Requirement (Pattern 4)</u>". 	Μ
4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 1)	Ν
1.4WAS FRONT ACTUATOR ADJUSTMENT	0
(P)With CONSULT-III	
1. Start the engine. CAUTION:	Ρ
 Stop the vehicle. 2. Turn the steering wheel to adjust "ACTR ROTA ANG" of the 4WAS front control unit "DATA MONITOR" so that it falls within the range shown below: 	

ACTR ROTA ANG : -3.5 - 3.5 deg

3. Turn the ignition switch OFF.

< BASIC INSPECTION >

CAUTION:

Never touch the steering wheel after turning ignition switch OFF.

>> END

4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 2) INFOID:000000001666293

1.4WAS FRONT ACTUATOR ADJUSTMENT

With CONSULT-III

- Turn the ignition switch ON. 1. **CAUTION:**
 - Never start the engine.
- Steer 30° leftward slowly. Steer 30° rightward and return the steering wheel to the straight-ahead position. 2.
- Perform the steering angle sensor neutral position adjustment. Refer to <u>BRC-8</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".
- Turn the ignition switch OFF. 4.

>> GO TO 2.

2. PERFORM ACTIVE TEST (SLOW MODE)

(P)With CONSULT-III

1. Start the engine. **CAUTION:**

Stop the vehicle.

- Select "SLOW MODE" item on "ACTIVE TEST" of 4WAS front control unit. 2.
- Perform "MODE START" of "ACTIVE TEST".
- 4. Steer the steering wheel leftward slowly until the turning stops.
- Steer the steering wheel rightward slowly until the turning stops. 5.

Is "OK" indicated on both right and left on "SLOW MODE"?

- YES >> GO TO 3.
- NO >> Refer to STC-30, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 4)".

3. PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

(P)With CONSULT-III

Perform 4WAS front control unit self-diagnosis.

NOTE:

Detect DTC "C1671" when replacing 4WAS front control unit or performing 4WAS front actuator adjustment. DTC "C1671" becomes past record if 4WAS front actuator adjustment is completed normally.

Is any error system detected?

YES >> Check the error system.

NO >> GO TO 4.

4.ERASE ERROR HISTORY

With CONSULT-III

Erase the memory of 4WAS main control unit and 4WAS main control unit self-diagnosis result.

>> END

4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)

INFOID:000000001666294

1.PERFORM ACTIVE TEST (LOCK OPERATION)

(R) With CONSULT-III

Stop the vehicle to the straight-ahead position. 1.

INSPECTION AND ADJUSTMENT < BASIC INSPECTION > 2. Turn the ignition switch ON. CAUTION: Never start the engine. Select "LOCK OPERATION" item on "ACTIVE TEST" of 4WAS front control unit. 4. Perform "RELEASE" of "ACTIVE TEST". CAUTION: Turn the steering wheel 90°. Check that the front wheels do not move. • Never turn the steering wheel during "RELEASE". 5. Turn the steering wheel to adjust "4WAS STR ANG" of the 4WAS front control unit "DATA MONITOR" so that it falls within the range shown below: **4WAS STR ANG** : -3.5 - 3.5 deg Perform "LOCK" item on "ACTIVE TEST" of 4WAS front control unit. 7. Steer 30° leftward slowly. Steer 30° rightward and return the steering wheel to the straight-ahead position. 8. Finish 4WAS front control unit active test. >> GO TO 2. 2.steering angle sensor neutral position adjustment 1. "ADJUSTMENT OF Perform the steering angle sensor neutral position adjustment. Refer to BRC-8. STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement". 2. Turn the ignition switch OFF. >> GO TO 3. ${f 3.}$ RETURN TO 4WAS FRONT ACTUATOR INITIAL POSITON 1. Start the engine. **CAUTION:** Stop the vehicle. 2. Steer 90° leftward slowly. Then steer 90° rightward. Steer 90° leftward slowly again. Then steer 90° rightward. Return the steering wheel to the straight-ahead position. 4. Stop the vehicle in the straight-ahead position after driving for a period of time. (When engine is running) >> GO TO 4. 4.CHECK 4WAS FRONT ACTUATOR INSPECTION (P)With CONSULT-III Check "4WAS STR ANG" item on "DATA MONITOR" of 4WAS front control unit. 1 CAUTION: Never touch the steering wheel during the service. **4WAS STR ANG** : -3.5 - 3.5 deg

Turn the ignition switch OFF. Is the inspection result normal?

YES >> GO TO 5. >> GO TO 1. NO

5.PERFORM ACTIVE TEST (SLOW MODE)

With CONSULT-III

- Start the engine. 1. **CAUTION:** Stop the vehicle.
- Select "SLOW MODE" item on "ACTIVE TEST" of 4WAS front control unit.
- 3. Perform "MODE START" of "ACTIVE TEST".
- 4 Steer the steering wheel leftward slowly until the turning stops.
- 5. Steer the steering wheel rightward slowly until the turning stops.

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INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

Is "OK" indicated on both right and left on "SLOW MODE"?

- YES >> GO TO 6.
- NO >> Refer to STC-30, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 4)".

$\mathbf{6}$.PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

(R)With CONSULT-III

Perform 4WAS front control unit self-diagnosis.

Is any error system detected?

YES >> Check the error system.

NO >> GO TO 7.

7.ERASE ERROR HISTORY

(R)With CONSULT-III

Erase the memory of 4WAS main control unit and 4WAS main control unit self-diagnosis result.

>> END

4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 4)

INFOID:000000001666295

1.CHECK 4WAS FRONT ACTUATOR

- 1. Stop the vehicle to the straight-ahead position.
- 2. Remove and install 4WAS front actuator again. Check the installation condition.
- Check that the steering wheel is neutral. 3

>> GO TO 2.

2.PERFORM ACTIVE TEST (LOCK OPERATION)

(R) With CONSULT-III

- 1. Stop the vehicle to the straight-ahead position.
- Turn the ignition switch ON. 2.

CAUTION:

Never start the engine.

- Select "LOCK OPERATION" item on "ACTIVE TEST" of 4WAS front control unit.
- 4. Perform "RELEASE" of "ACTIVE TEST".
 - **CAUTION:**
 - Turn the steering wheel 90°. Check that the front wheels do not move.
 - Never turn the steering wheel during "RELEASE".
- Turn the steering wheel to adjust "4WAS STR ANG" of the 4WAS front control unit "DATA MONITOR" so 5. that it falls within the range shown below:

4WAS STR ANG : -3.5 - 3.5 deg

- Perform "LOCK" item on "ACTIVE TEST" of 4WAS front control unit. 6.
- Finish 4WAS front control unit active test.

>> GO TO 3.

 ${f 3}.$ STEERING ANGLE SENSOR NEUTRAL POSITION ADJUSTMENT

- 1. Perform the steering angle sensor neutral position adjustment. Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".
- 2. Turn the ignition switch OFF.

>> GO TO 4.

4.RETURN TO 4WAS FRONT ACTUATOR INITIAL POSITON

1. Start the engine.

INSPECTION AND ADJUSTMENT

 CAUTION: Stop the vehicle. Steer 90° leftward slowly. Then steer 90° rightward. Steer 90° leftward slowly again. Then steer 90° rightward. Return the steering wheel to the straight-aher position. Stop the vehicle in the straight-ahead position after driving for a period of time. (Engine running) > GO TO 5. CHECK 4WAS FRONT ACTUATOR 	аd
 Stop the vehicle in the straight-ahead position after driving for a period of time. (Engine running) >> GO TO 5. 	
_	
5. CHECK 4WAS FRONT ACTUATOR	
 With CONSULT-III Check "4WAS STR ANG" item on "DATA MONITOR" of 4WAS front control unit. CAUTION: Never touch the steering wheel during the service. 	
Never touch the steering wheel during the service.	
4WAS STR ANG : -3.5 - 3.5 deg	
2. Turn the ignition switch OFF.	
<u>Is the inspection result normal?</u> YES >> GO TO 6.	
NO >> GO TO 1.	
6.PERFORM ACTIVE TEST (SLOW MODE)	00
With CONSULT-III Start the engine. CAUTION:	
 Stop the vehicle. Select "SLOW MODE" item on "ACTIVE TEST" of 4WAS front control unit. Perform "MODE START" of "ACTIVE TEST". Steer the steering wheel leftward slowly until the turning stops. 	
 Steer the steering wheel rightward slowly until the turning stops. <u>Is "OK" indicated on both right and left on "SLOW MODE"?</u> 	
YES >> GO TO 7.	
NO >> GO TO 1.	
PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)	
With CONSULT-III Perform 4WAS front control unit self-diagnosis.	
Is any error system detected?	
YES >> Check the error system. NO >> GO TO 8.	
8. ERASE ERROR HISTORY	
With CONSULT-III Erase the memory of 4WAS front control unit and 4WAS main control unit self-diagnosis result.	
>> END	

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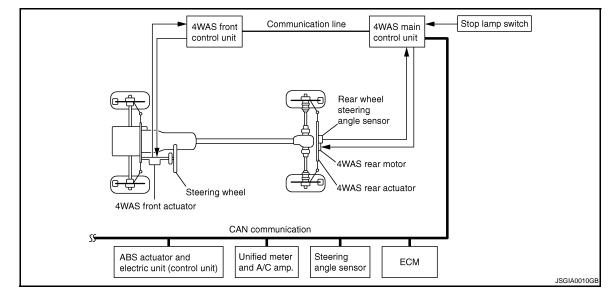
FUNCTION DIAGNOSIS 4WAS SYSTEM

System Diagram

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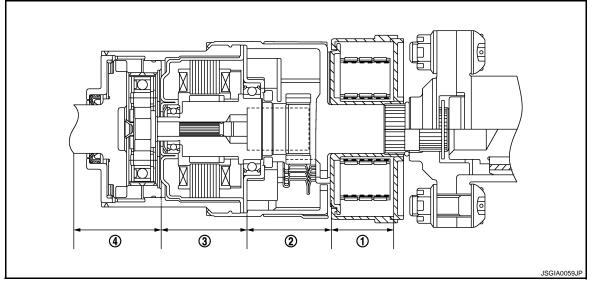
[WITH 4WAS]

CONTROL DIAGRAM



CROSS-SECTIONAL VIEW

4WAS Front Actuator



1. Front wheel steering angle sensor

2. 4WAS front lock solenoid valve (lock 3. 4WAS front motor structure)

4. Gear shaft

< FUNCTION DIAGNOSIS >

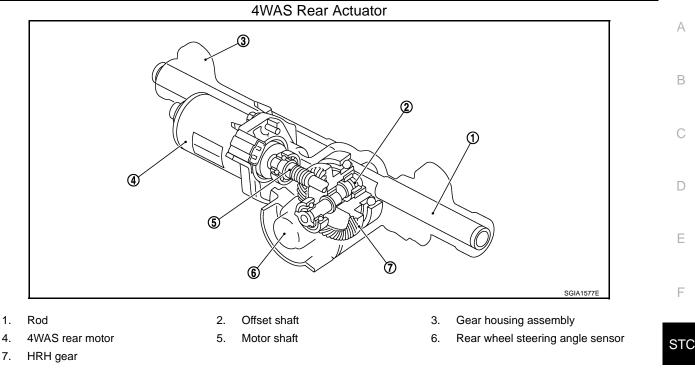
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System Description

DESCRIPTION

- 4WAS system consists of two control units (4WAS front control unit and 4WAS main control unit) and 4WAS rear actuator components.
- 4WAS main control unit calculates front wheel and rear wheel angles via CAN communication based on the information of the steering angle sensor signal and vehicle speed signal.
- 4WAS main control unit controls 4WAS rear actuator according to the value calculated in 4WAS main control unit.
- It transmits the value that is calculated by 4WAS main control unit to 4WAS front control unit via 4WAS communication line (exclusive line of 4WAS system). 4WAS front control unit controls 4WAS front actuator based on the received demand.
- Self-diagnosis can be performed with CONSULT-III at each control unit to another (4WAS front control unit and 4WAS main control unit).
- It transmits/receives each signal from the following control unit via CAN communication line.

Component parts	Function	
Steering angle sensor	It mainly transmits the following signals to 4WAS main control unit with CAN communication. • Steering angle sensor signal	
ABS actuator and electronic unit (con- trol unit)	It mainly transmits the following signals to 4WAS main control unit with CAN communication. • Vehicle speed signal	
ECM	It mainly transmits the following signals to 4WAS main control unit with CAN communication. Engine speed signal 	
Combination meter	It mainly transmits the following signals from 4WAS main control unit with CAN communica- tion. 4WAS warning lamp signal 	

*: Communication line between 4WAS front control unit and 4WAS main control unit

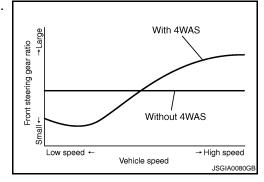
Operation Description

- The following performance is gained by controlling the best front wheel steering angle and the rear wheel steering angle.
- The desirable vehicle movement is gained toward the driver's steering angle operation (steering angle).

< FUNCTION DIAGNOSIS >

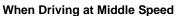
[WITH 4WAS]

The steering gear ratio changes according to the vehicle speed. The steering wheel operation (steering angle) load decreases.

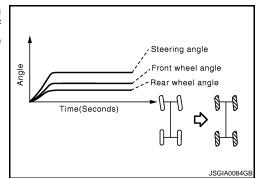


When Driving at Low Speed

• Increased front wheel angle gains the optimum front wheel angle by minimum steering wheel operation (steering angle).



 Increase the front steering angle while controlling to turn the rear wheel steering angle to the same steering angle side of steering wheel operation (steering angle). these operations make response better for vehicle yaw rate/lateral acceleration and also decrease the angle of sideslip.



When Driving at High Speed Decrease the front wheel steering angle while controlling to turn

the rear wheel steering angle to the same steering angle side of steering wheel operation (steering angle). these operations make car response better and vehicle stability higher.

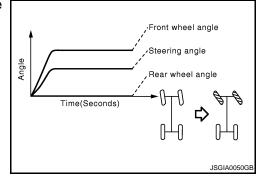
Operation Feature

4WAS FRONT ACTUATOR

- It is driven by 4WAS front motor.
- The front steering gear ratio (4WAS front actuator) changes with 4WAS front motor and the gear shaft when releasing the lock structure (4WAS front lock solenoid valve).
 NOTE:
 - The lock structure is released when turning 4WAS lock solenoid valve ON.

STC-34

Front wheel angle Steering angle - Rear wheel angle Time(Seconds)



< FUNCTION DIAGNOSIS >

[WITH 4WAS]

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 The lock structure (holder) absorbs force and applies the lock when applying strong force to 4WAS front actuator.

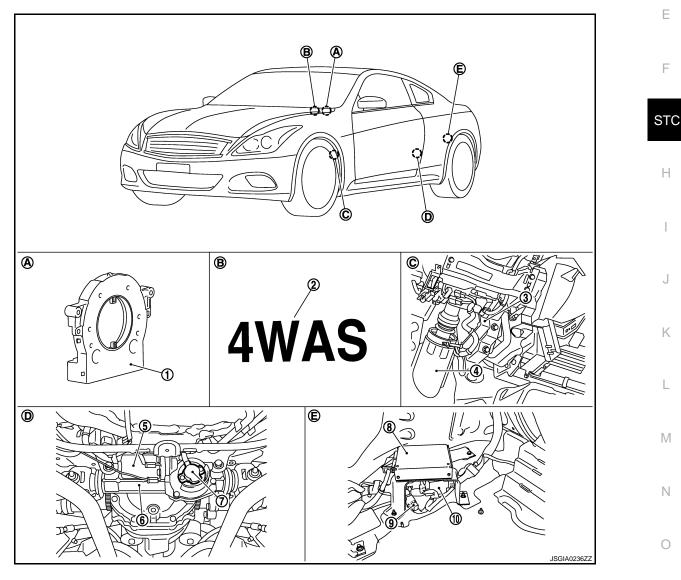
CAUTION:

Replace 4WAS front actuator when the system breaks down due to the excessive external force (rotating direction) applied to 4WAS front actuator.

4WAS REAR ACTUATOR

- It is driven by 4WAS rear motor.
- The irreversible efficiency performance hypoid gear secure the toe-stiffness of rear wheels against the road external force and keep the steering angle when system is malfunction.
- The power from the pinion gear (motor side) is transmitted, but the pinion gear does not rotate as caused by the gear mechanical characteristics (teeth angle) even though the ring gear (tire side) starts to rotate.

Component Parts Location



- 1. Steering angle sensor
- 4. 4WAS front actuator
- 7. Rear wheel steering angle sensor
- 10 Noise suppressor

- 2. 4WAS warning lamp
- 5. 4WAS rear motor
- 8. 4WAS main control unit
- 3. 4WAS front control unit
- 6. 4WAS rear actuator
- 9. 4WAS rear motor relay

Ρ

< FUNCTION DIAGNOSIS >

Component Description

- A. Combination switch
- D. 4WAS rear actuator assembly
- B. Inside combination meter

C. Inside the instrument driver lower panel

E. Inside the rear wheel house finisher (left)

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[WITH 4WAS]

Component parts	Reference/Function		
4WAS front control unit	STC-55, "Description"		
4WAS front actuator	The front wheel steering angle is activated.		
Front wheel steering angle sensor	The front wheel steering angle increased/decreased degree is detected. It is output to 4WAS front control unit.		
4WAS front motor	The front wheel steering angle increased/decreased degree is activated.		
4WAS front lock solenoid valve	Secure the inside of 4WAS front actuator temporarily. (It operates when performing active test with fail-safe function and CONSULT-III.)		
Steering angle sensor	STC-112, "Description"		
4WAS main control unit	STC-87, "Description"		
4WAS rear actuator	The rear wheel steering angle is activated.		
Rear wheel steering angle sensor	The rear wheel steering angle increased/decreased degree is detected. It is output to 4WAS main control unit.		
4WAS rear motor	4WAS rear actuator is activated.		
ABS actuator and electronic unit (con- trol unit)	STC-110, "Description"		
ECM	STC-115, "Description"		
Combination meter	It mainly transmits the following signals from 4WAS main control unit with CAN communica- tion. • 4WAS warning lamp signal		
Power steering solenoid valve	The power steering oil pressure in the gear housing assembly is controlled.		
Stop lamp switch	The stop lamp switch condition is detected.		

*: Communication line between 4WAS front control unit and 4WAS main control unit

< FUNCTION DIAGNOSIS >

EPS SYSTEM

System Diagram

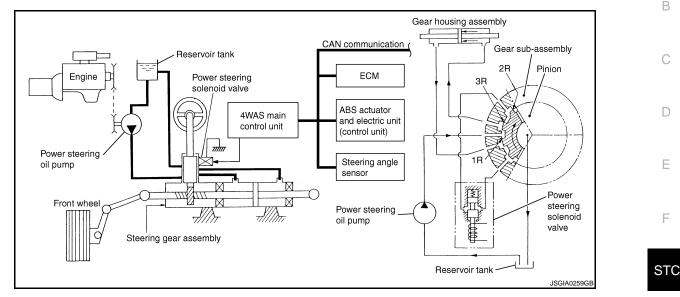
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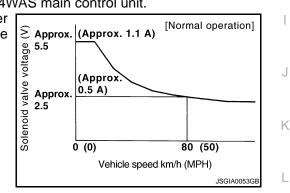
А



System Description

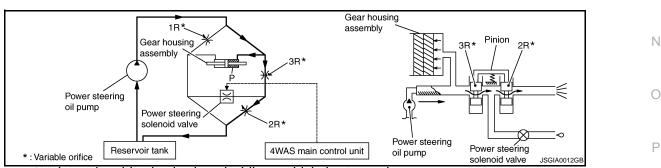
DESCRIPTION

- The EPS system controls the power steering solenoid valve with 4WAS main control unit.
- The power steering solenoid valve control changes the power steering solenoid valve activation voltage according to the vehicle speed.



OPERATION PRINCIPLE

During Parking (When Turning The Steering Wheel To The Right.)

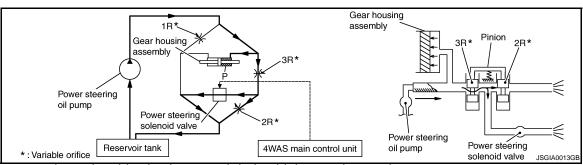


- 1. Power steering solenoid valve is closed while a vehicle is stopped.
- 2. Pinion "1R", "2R" and "3R" are closed depending on steering torque of steering wheel.
- 3. Oil pressure "P" in the gear housing assembly is the sum of oil pressures occurring in "2R" and "3R". This results in a light steering force because of high pressure.

During High-speed Operation

Revision: 2007 June

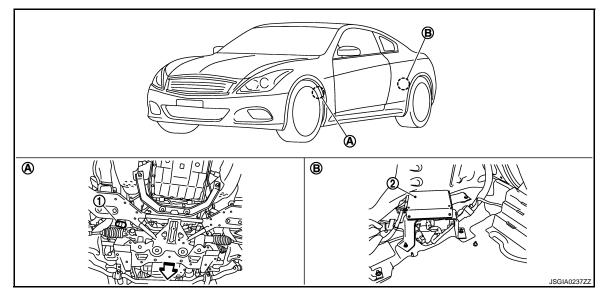
EPS SYSTEM



- 1. Power steering solenoid valve is opened during high-speed operation.
- 2. Pinion "1R", "2R" and "3R" are closed depending on steering torque of steering wheel.
- 3. "2R" is bypassed to the return port by the EPS solenoid valve.
- 4. Oil pressure "P" in the gear housing assembly includes only oil pressure occurring in "3R" and results in a heavy steering force.

Component Parts Location

INFOID:000000001666302



- 1. Power steering solenoid valve
- A. Steering gear assembly
- 2. 4WAS main control unit
- B. Inside the rear wheel hose finisher (left)

C:Vehicle front

Component Description

Component parts	Function	
4WAS main control unit	 The power steering solenoid valve activation voltage is controlled by each sensor signal. The power steering solenoid valve activation voltage is controlled by 4WAS main control unit for maintaining the power steering force in the fail-safe mode. (EPS system is controlled by the engine speed signal if the vehicle speed signal error is detected.) 	
ABS actuator and electric unit (control unit)	It mainly transmits the following signals to 4WAS main control unit with CAN communication. • Vehicle speed signal	
ECM	It mainly transmits the following signals to 4WAS main control unit with CAN communication. Engine speed signal 	
Power steering solenoid valve	The power steering oil pressure in the gear housing assembly is controlled.	

< FUNCTION DIAGNOSIS >

DIAGNOSIS SYSTEM (4WAS FRONT CONTROL UNIT)

CONSULT-III Function [4WAS(FRONT)]

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[WITH 4WAS]

FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown as follows:

Diagnostic test mode	Function	(
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	•
Data monitor	Input/Output data in the 4WAS front control unit can be read.	
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.	. [
Active test	• Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the 4WAS front control unit and also shifts some parameters in a specified range.	
ECU part number	4WAS front control unit part number can be read.	•

SELF-DIAG RESULT MODE

Display Item List

Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause	STC
ACTUATOR [C1621]	4WAS front motor current error is detected. (4WAS front motor current is excessively large.)	4WAS front control unit or 4WAS front motor error is de- tected.	Н
ACTUATOR [C1622]	4WAS front motor voltage or current error is detected. (4WAS front motor voltage error is detected.) (Voltage or current error is detected when starting the system.)	4WAS front control unit or 4WAS front motor error is de- tected.	I
ACTUATOR [C1627]	The indication value from 4WAS front actuator (front wheel angle) dif- fers from the value from 4WAS front control unit.	4WAS front actuator error	
ACTUATOR [C1628]	The front wheel steering angle sensor error is detected.	Front wheel steering angle sensor error	J
CONTROL UNIT [C1631]	An error is detected inside 4WAS front control unit.	4WAS front control unit or 4WAS front control unit power supply error is detected.	K
CONTROL UNIT [C1632]	An error is detected inside 4WAS front control unit.	4WAS front control unit or 4WAS front control unit power supply error is detected.	L
CONTROL UNIT [C1633]	An error is detected inside 4WAS front control unit.	4WAS front control unit error	
IGN POWER SUPPLY [C1651]	The ignition voltage signal error is detected.	4WAS front control unit or the ignition power supply error is detected.	Μ
MOTOR POWER SUPPLY [C1652]	4WAS front motor main power supply error is detected.	4WAS front control unit or 4WAS front motor power sup- ply error is detected.	Ν
ACTUATOR RELAY [C1654]	An error is detected on the main relay power supply inside 4WAS front control unit.	The main relay power supply inside 4WAS front control unit error is detected.	0
PRE-DRIVER [C1655]	4WAS rear motor 3-phase current error is detected. (Current is not applied to 4WAS front motor.)	4WAS front control unit or 4WAS front motor power sup- ply error is detected.	Ρ
LOCK SOLENOID [C1661]	4WAS front lock solenoid valve error is detected. (An electric activation error is detected.)	4WAS front control unit or 4WAS front lock solenoid valve error is detected.	
LOCK INSERTION [C1667]	4WAS front lock solenoid valve (lock) error is detected. (An error is detected in lock condition.)	The inside 4WAS front actua- tor error is detected.	

< FUNCTION DIAGNOSIS >

[WITH 4WAS]

Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
LOCK HLD GAP DETCT [C1668]	4WAS front lock solenoid valve (lock) error is detected. (Excessive force is applied to the lock.)	The inside 4WAS front actua- tor error is detected.
INCOMP LOCK RELEAS [C1669]	4WAS front actuator error is detected. (An error is detected in unlock condition.)	The power steering oil pres- sure or the inside 4WAS front actuator error is detected.
ACT ADJ NOT PRFRM [C1671]	4WAS front actuator adjustment is not performed.	4WAS front actuator adjust- ment is not performed.
INCOMP ACTUATR ADJ [C1672]	4WAS front actuator adjustment is incomplete.	4WAS front actuator adjust- ment is incomplete.
4WAS MAIN ECU COMM [C1684]	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS main control unit.)	4WAS communication line*/ 4WAS main control unit/ 4WAS front control unit error
4WAS MAIN ECU COMM [C1685]	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS main control unit.)	4WAS communication line*/ 4WAS main control unit/ 4WAS front control unit error
4WAS MAIN ECU [C1686]	An error is detected on 4WAS main control unit side. (4WAS main control unit fail-safe mode.)	4WAS main control unit fail- safe mode
CAN COMM CIRCUIT [U1000]	When 4WAS front control unit is not transmitting or receiving 4WAS communication signal for 2 seconds or more.	4WAS communication line*/ 4WAS main control unit/ 4WAS front control unit error
SYSTEM COMM(CAN) [U1002]	When 4WAS front control unit is not transmitting or receiving 4WAS communication signal for 2 seconds or less.	4WAS communication line*/ 4WAS main control unit/ 4WAS front control unit error
CONTROL UNIT (CAN) [U1010]	When detecting error during the initial diagnosis of 4WAS controller of 4WAS front control unit.	4WAS communication line*/ 4WAS main control unit/ 4WAS front control unit error

*: Communication line between 4WAS front control unit and 4WAS main control unit.

DATA MONITOR MODE

Display Item List

Monitor item (Unit)	Remarks
4WAS STR ANG [deg]	The steering angle sensor signal received from 4WAS main control unit via 4WAS commu- nication line * is indicated.
VEHICLE SPEED [km/h] or [mph]	The vehicle speed signal received from 4WAS main control unit via 4WAS communication line * is indicated.
MOTOR CURRENT [A]	4WAS front motor power supply current is indicated. (4WAS front control unit main power supply)
MTR CRNT ESTM [A]	The value, which 4WAS front control unit presumes 4WAS front motor power supply current, is indicated. (4WAS front control unit main power supply)
ACTR ROTA ANG [deg]	4WAS front actuator increased/decreased angle is indicated.
LG VOLT [V]	4WAS front lock solenoid valve voltage is indicated.
THERM TEMP [°C]	4WAS front control unit internal temperature is indicated.
MOTOR VOLT [V]	4WAS front motor power supply voltage is indicated. (4WAS front control unit main power supply)
IGN VOLT [V]	4WAS front control unit power supply voltage is indicated. (Ignition switch power supply voltage)
ACTR ANG COMM [deg]	The command value of 4WAS front actuator increased/decreased angle received from 4WAS main control unit via 4WAS communication line* is indicated.
ACTR ROTA SPD [deg/s]	4WAS front actuator increased/decreased rotation speed is indicated.
DUTY COMMAND [%]	4WAS front actuator command voltage ratio is indicated.

< FUNCTION DIAGNOSIS >

[WITH 4WAS]

Monitor item (Unit)	Remarks	
LOCK DTY COMM [%]	4WAS front lock solenoid valve command voltage ratio is indicated.	
MTR U VOLT [V]	4WAS front motor U terminal voltage is indicated.	
MTR V VOLT [V]	4WAS front motor V terminal voltage is indicated.	
MTR W VOLT [V]	4WAS front motor W terminal voltage is indicated.	
ACT TEMP ESTM [°C]	The value, which 4WAS front control unit presumes 4WAS front actuator temperature, is indicated.	
MTR PHZ CRNT [A]	4WAS front motor U, V, and W terminal current is indicated.	
ACTR DEVI ANG [deg]	4WAS front actuator command value and the activation angle difference are indicated.	
ACTR ANGL SUB [deg]	The final command value, which 4WAS front control unit calculates 4WAS front actuator command value transmitted from 4WAS front control unit through 4WAS communication line*, is indicated.	
STR ANGL SPD [deg/s]	It displays an engine speed value obtained from an angle calculated with the 4WAS front con- trol unit, based on steering angle sensor speed signals transmitted from the 4WAS main con- trol unit through the 4WAS communication line*.	
OVRLD JDG TMG	It displays record of 4WAS system (entire 4WAS system) high load. (It displays time of occurrence before turning ignition switch ON.)	
ACT PRTCT TMG	It displays record of 4WAS system (4WAS front actuator) overheating. (It displays time of occurrence before turning ignition switch ON.)	
ECU PRTCT TMG	It displays record of 4WAS system (4WAS front control unit) overheating. (It displays time of occurrence before turning ignition switch ON.)	
DRV TMPO TMG	It displays record of 4WAS system (terminal power supply converter of 4WAS front motor) intermittent abnormal. (It displays time of occurrence before turning ignition switch ON.)	
MTR PW TMP TM	It displays record of 4WAS system (terminal voltage of 4WAS front motor) intermittent abnor- mal. (It displays time of occurrence before turning ignition switch ON.)	
LOW VOLT TMG	It displays record of 4WAS system (terminal voltage of 4WAS front control unit and 4WAS front actuator) low voltage. (It displays time of occurrence before turning ignition switch ON.)	
HIGH VOLT TMG	It displays record of 4WAS system (terminal voltage of 4WAS front control unit and 4WAS front actuator) extreme voltage. (It displays time of occurrence before turning ignition switch ON.)	
OVRLD JDG FLG [On/Off]	 4WAS system (the entire system) heavy load condition is indicated. 4WAS system protection function mode 	
ACT PRTCT FLG [On/Off]	 4WAS system (4WAS front actuator) over-heated condition is indicated. 4WAS system protection function mode 	
ECU PRTCT FLG [On/Off]	 4WAS system (4WAS front control unit) over-heated condition is indicated. 4WAS system protection function mode 	
DRV TMPO FLG [On/Off]	 4WAS system (4WAS front motor terminal power supply converter) intermittent error is indicated. 4WAS system protection function mode 	
MTR PW TMP FL [On/Off]	 4WAS system (4WAS front motor terminal power supply front driver) intermittent error is indicated. 4WAS system protection function mode 	
LOW VOLT FLG [On/Off]	 4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) voltage- dropped condition 4WAS system protection function mode 	
HIGH VOLT FLG [On/Off]	 4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) voltage- jumped condition 4WAS system protection function mode 	
MTR SEN U OUT [Hi/Low]	4WAS front motor U terminal output voltage is indicated.	
MTR SEN V OUT [Hi/Low]	4WAS front motor V terminal output voltage is indicated.	
MTR SEN W OUT [Hi/Low]	4WAS front motor W terminal output voltage is indicated.	

Revision: 2007 June

< FUNCTION DIAGNOSIS >

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Monitor item (Unit)	Remarks
MAIN ECU FAIL [On/Off]	4WAS main control unit fail-safe function condition transmitted from 4WAS main control unit through 4WAS communication line * is indicated.
M-ECU TMPO FL [On/Off]	The protection function mode status of 4WAS main control unit transmitted from 4WAS main control unit through 4WAS communication line* is indicated.
LOCK MODE [0/1/2/3/4/5]	 4WAS front lock solenoid valve (lock structure) condition is indicated. 0: Lock released condition 1 – 5: Lock condition
NEUTRAL OUT [On/Off]	4WAS front actuator misaligned angle adjustment control condition is indicated.
EX OPERAT [On/Off]	4WAS system enters in the protection function due to the heavy load condition and tempo- rarily abnormal voltage is indicated.
SLOW MODE [Ok/-]	ACTIVE TEST "SLOW MODE" judgment condition is indicated.

*: Communication line between 4WAS front control unit and 4WAS main control unit

CAN DIAGNOSTIC SUPPORT MONITOR

Description

- The communication condition from 4WAS front control unit to 4WAS main control unit and malfunction counter are displayed.
- Error counter displays OK if any malfunction is not detected in the past. If the malfunction is detected, it displays 0. The upper limit of the counters is 39.

Item	PRSNT	PAST
TRANSMIT DIAG	OK / UNKWN	OK / 0 – 39
4WAS(MAIN)	OK / UNKWN	OK / 0 – 39

ACTIVE TEST MODE

Description

- 4WAS front actuator assembly activation is checked according to the control signal from CONSULT-III.
- 4WAS front lock solenoid valve (lock structure) is activated forcibly (ON/OFF) using each control signal of "LOCK OPERATION". Perform this mode when performing 4WAS front actuator adjustment.
 CAUTION:

Never steer the steering wheel during "RELEASE".

 The steering angle sensor neutral point judgment (OK/NG) is performed using each control signal of "SLOW MODE".

Select test item	Control signal	Remarks
LOCK OPERATION	RELEASE	4WAS front lock solenoid valve lock is re- leased.
LUCK OPERATION	LOCK	4WAS front lock solenoid valve lock is applied.
SLOW MODE	MODE START	Steering angle sensor neutral point check starts. (Turn the steering wheel rightward and left- ward slowly. Steer until the turning stops.)
	MODE END	Steering angle sensor neutral point check ends.

< FUNCTION DIAGNOSIS >

DIAGNOSIS SYSTEM (4WAS MAIN CONTROL UNIT)

CONSULT-III Function [4WAS(MAIN)/RAS/HICAS]

FUNCTION

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

Diagnostic test mode	Function	С
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	
Data monitor	Input/Output data in the 4WAS main control unit can be read.	
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.	
Active test	• Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the 4WAS main control unit and also shifts some parameters in a specified range.	-
ECU part number	4WAS main control unit part number can be read.	E

SELF-DIAG RESULT MODE

Display Item List

Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
CONTROL UNIT [ABNORMAL1] [C1900]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
CONTROL UNIT [ABNORMAL2] [C1901]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
MOTOR OUTPUT [REV CURRENT] [C1902]	4WAS rear motor current error is detected. (4WAS rear motor current output direction differs.)	4WAS rear motor error
MOTOR OUTPUT [NO CURRENT] [C1903]	4WAS rear motor current error is detected. (Current is input to 4WAS main control unit if 4WAS main control unit output is "OFF".)	4WAS rear motor error
MOTOR OUTPUT [OVERCURRENT] [C1904]	4WAS rear motor current error is detected. (4WAS rear motor output current is large.)	4WAS rear motor error
CONTROL UNIT [ABNORMAL3] [C1905]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
CONTROL UNIT [ABNORMAL5] [C1906]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
CONTROL UNIT [ABNORMAL4] [C1907]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
CONTROL UNIT [ABNORMAL7] [C1908]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
CONTROL UNIT [ABNORMAL6] [C1909]	An error is detected inside 4WAS main control unit.	4WAS main control unit
MOTOR OUTPUT [MOTOR LOCK] [C1910]	Inside 4WAS rear motor error is detected. (4WAS main motor does not move or the rear wheel angle sensor value does not change if 4WAS main control unit output is 14A or more.)	4WAS rear motor error

[WITH 4WAS]

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< FUNCTION DIAGNOSIS >

[WITH 4WAS]

Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
MOTOR VOLTAGE [LOW VOLTAGE] [C1911]	4WAS rear motor voltage error is detected. (4WAS rear motor voltage is low.)	4WAS rear motor power supply error
MOTOR VOLTAGE [BAD OBSTRCT] [C1912]	4WAS rear motor voltage error is detected. (Voltage is applied to 4WAS main motor if 4WAS main control unit output is "OFF".)	4WAS rear motor power supply error
MOTOR OUTPUT [ABNORML SIG] [C1913]	4WAS rear motor current error is detected. (4WAS main motor does not move or the rear wheel angle sensor output does not change when 4WAS main control unit output is 18A or more and 4WAS main motor output is low.)	4WAS rear motor error
RR ST ANGLE SENSOR [ABNORML VOL] [C1914]	The rear wheel angle sensor power supply error is detected.	Rear wheel steering sensor power supply error
RR ST ANGLE SENSOR [MAIN SIGNAL] [C1915]	The rear wheel angle sensor signal (main) output voltage value error is detected.	Rear wheel steering sensor out- put voltage error
RR ST ANGLE SENSOR [SUB SIGNAL] [C1916]	The rear wheel angle sensor signal (sub) output voltage value error is detected.	Rear wheel steering sensor out- put voltage error
RR ST ANGLE SENSOR [OFFSET SIG1] [C1917]	The rear wheel angle sensor signal (main and sub) error is detected. (The output signal value differs temporarily between main and sub.)	Rear wheel steering sensor (main and sub) output signal val- ue error signal
RR ST ANGLE SENSOR [OFFSET SIG2] [C1918]	The rear wheel angle sensor signal (main and sub) error is detected. (The output signal value differs between main and sub.)	Rear wheel steering sensor (main and sub) output signal er- ror
VEHICLE SPEED SEN [NO SIGNAL] [C1919]	Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) via CAN communication. (Improper signal is input while driving.)	Vehicle speed signal error
STEERING ANGLE SEN [NO SIGNAL] [C1920]	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. (No transmission from the steering angle sensor)	Steering angle sensor input sig- nal error
ENG REV SIGNAL [C1921]	Malfunction is detected in engine speed signal that is output from ECM via CAN communication. (Improper signal is input to the engine speed.)	Engine speed signal error
CONTROL UNIT [ABNORMAL8] [C1922]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
STEERING ANGLE SEN [NO CHANGE] [C1923]	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. [Steering angle sensor input signal error is detected when driving at 60 km/h (37MPH) or more.]	Steering angle sensor input sig- nal error
STEERING ANGLE SEN [NO NEUT STATE] [C1924]	Driving continuously at 10 km (6 mile) while the steering angle sen- sor value is other than L10° – R10°. (Not detected in 4WAS front control unit fail-safe mode)	Steering angle sensor input sig- nal error
AD CONVERTER [C1925]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
STEERING ANGLE SEN [C1926]	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. (When improper signal inputs to steering angle sensor and steering angle sensor itself detects the malfunction)	Steering angle sensor error
CONTROL UNIT [ABNORMAL5] [C1927]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
CONTROL UNIT [ABNORMAL9] [C1928]	An error is detected inside 4WAS main control unit.	4WAS main control unit error

< FUNCTION DIAGNOSIS >

[WITH 4WAS]

Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause	1
4WAS FRONT ECU [C1930]	An error is detected on 4WAS front control unit side. (4WAS front control unit fail safe mode)	4WAS front control unit fail-safe mode	
4WAS FRONT ECU COMM [C1931]	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS front control unit.)	4WAS communication line/ 4WAS front control unit/4WAS main control unit error	E
STEERING ANGLE SEN [C1932]	If the steering angle sensor error is detected. (Steering angle sensor output value is abnormal.)	Steering angle sensor input sig- nal error	(
CONTROL UNIT [C1933]	An error is detected inside 4WAS main control unit.	4WAS main control unit error	[
CAN COMM [U1000]	When 4WAS main control unit is not transmitting or receiving CAN communication signal for 2 seconds or more.	CAN communication error	
CONTROL UNIT (CAN) [U1010]	When detecting error during the initial diagnosis of CAN controller of 4WAS main control unit.	CAN communication line and 4WAS main control unit/ECM/ ABS actuator and electric unit (control unit) error	E

*: Communication line between 4WAS front control unit and 4WAS main control unit

DATA MONITOR MODE

Display Item List

Monitor item (Unit)	Remarks
VHCL SPEED SE [km/h] or [mph]	The vehicle speed signal from ABS actuator and electric unit (control unit) is indicated with CAN communication line.
STEERING ANG [°]	The steering angle sensor signal from the steering angle sensor is indicated with CAN com- munication line.
ENGINE SPEED [rpm]	The engine speed signal from ECM is indicated with CAN communication line.
STR ANGL SPD [deg/s]	The steering angle speed signal from the steering angle sensor is indicated with CAN com- munication line.
POWER STR SOL [A]	The current value of the power steering solenoid valve is indicated.
RR ST ANG-MAI [V]	The voltage of the rear wheel steering angle sensor (main) is indicated.
RR ST ANG-SUB [V]	The voltage of the rear wheel steering angle sensor (sub) is indicated.
RR ST ANG-VOL [V]	The power supply voltage of the rear wheel steering angle sensor is indicated.
C/U VOLTAGE [V]	The power supply voltage value of 4WAS main control unit is indicated.
MOTOR VOLTAGE [V]	The voltage value of 4WAS rear motor is indicated.
MOTOR CURRENT [A]	The current value of 4WAS rear motor is indicated.
MTR CRNT OPE [A]	The current value input to 4WAS rear motor is indicated.
RR ANG OPE [deg]	The angle command value is indicated for activating 4WAS rear motor.
FR ANGLE OPE [°]	The front wheel angle value transmitted from 4WAS main control unit to 4WAS front control unit is indicated.
STOP LAMP SW [On/Off]	The stop lamp switch status is indicated.
HICAS RELAY [On/Off]	4WAS rear motor relay condition is indicated.
FAIL SAFE [On/Off]	The fail-safe mode status of 4WAS main control unit is indicated.
WARNING LAMP [On/Off]	4WAS warning lamp ON/OFF condition is indicated.
FRONT ECU FAIL [On/Off]	The fail-safe mode status of 4WAS main control unit transmitted from 4WAS front control unit via 4WAS communication line* is indicated.
FRONT ECU EX [On/Off]	The protection function mode status of 4WAS front control unit transmitted from 4WAS front control unit via 4WAS communication line* is indicated.

*: Communication line between 4WAS front control unit and 4WAS main control unit

CAN DIAGNOSTIC SUPPORT MONITOR

STC

< FUNCTION DIAGNOSIS >

Description

- The communication status and the number of errors of 4WAS main control unit, ECM, ABS actuator and electric unit (control unit), 4WAS front control unit and the steering angle sensor are indicated.
- Error counter displays OK if any malfunction is not detected in the past. If the malfunction is detected, it displays 0. The upper limit of the counters is 39.

Item	PRSNT	PAST
TRANSMIT DIAG	OK / UNKWN	OK / 0 – 39
ECM	OK / UNKWN	OK / 0 – 39
VDC/TCS/ABS	OK / UNKWN	OK / 0 – 39
STRG	OK / UNKWN	OK / 0 – 39
4WAS	OK / UNKWN	OK / 0 – 39

ACTIVE TEST MODE

Description

- 4WAS rear actuator assembly activation is checked according to the control signal from CONSULT-III.
- The control signal forcibly activates (ON/OFF) 4WAS rear assembly, performs the self-diagnosis and checks each sensor in "SELF DIAGNOSTIC MODE".

CAUTION:

Perform the active test while the vehicle is stopped.

Select test item	Contr	ol signal	Remarks	
SELF DIAGNOSTIC MODE	ON CAUTION: Perform the active is stopped.	orm the active test while the vehicle		
	OFF		4WAS rear actuator assembly stops the ac- tivation.	
Standard value				
Monitor item		Active test "ON"		
STEERING ANG	0° (Neutral)	R 90°	L 90°	
	0.4.1/	A	N/ 0.4.V/	

RR ST ANG-MAI	2.4 V	Approx. 4.4 V	Approx. 0.4 V
RR ST ANG-SUB	2.4 V	Approx. 4.4 V	Approx. 0.4 V
MOTOR CURRENT	No output (Approx. 0 A)	Output (change)	

C1621, C1622 4WAS FRONT ACTUATOR

< COMPONENT DIAGNOSIS >

COMPONENT DIAGNOSIS C1621, C1622 4WAS FRONT ACTUATOR

Description

- Wiring connected to 4WAS front actuator is integrated with 4WAS front actuator.
- 4WAS front actuator rotates together with steering wheel.
- 4WAS front actuator mainly consists of five components. [4WAS front lock solenoid valve (lock structure), front wheel steering angle sensor, 4WAS front motor, gear shaft, and spiral cable]
- 4WAS front lock solenoid valve (lock structure) is controlled by the 4WAS front control unit, and locks/ unlocks 4WAS front actuator.
- If a strong force (rotation direction) is applied to 4WAS front actuator, the locking mechanism (holder) absorbs the force and locks 4WAS front actuator.
- Front wheel steering angle sensor detects a turning angle of 4WAS front motor.
- 4WAS front motor controls number of revolutions by a command value from the 4WAS front control unit.
- Gear shaft is an output axis of 4WAS front motor. (Gear shaft = 4WAS front motor revolution + steering angle)
- Spiral cables mean the power line and signal lines of 4WAS front motor.

DTC Logic

INFOID:000000001666307

[WITH 4WAS]

INFOID:000000001666306

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DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause	ŀ
C1621	ACTUATOR	4WAS front motor current valve error is detected. (4WAS front motor current valve is excessively large.)	4WAS front control unit or 4WAS front motor error is detected.	I
C1622	ACTUATOR	4WAS front motor voltage valve or current error valve is detected. (4WAS front motor voltage valve error is detected.) (Voltage valve or current valve error is detected when starting the system.)	4WAS front control unit or 4WAS front motor error is detected.	J

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- 1. Start the engine.
 - CAUTION:

Stop the vehicle.

- Steer 360° leftward slowly. Then steer 360° rightward to return the steering wheel to the straight-ahead M position. Repeat the same service for 1 minute or more.
 - NOTE:

The protection function mode (overheat protection) activates and the system stops if steering repeats for a long time.

3. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1621" or "C1622" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-47. "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK 4WAS FRONT MOTOR CIRCUIT

1. Turn the ignition switch OFF.

2. Disconnect 4WAS front actuator harness connector.

3. Check the resistance between 4WAS front actuator harness connectors.

[WITH	4WAS]
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4WAS front actuator				Resistance
Connector	Terminal	Terminal	(Approx.)	
	1		5	
M351	1	M351	6	0.1 – 1 Ω
	5		6	

4. Check the continuity between 4WAS front actuator harness connector and the ground.

4WAS front actuator		Continuity
Connector	Terminal	Continuity
	1 – Ground	
M351	5 – Ground	Not existed
	6 – Ground	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace 4WAS front actuator. Refer to STC-179, "Removal and Installation".

2. PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

With CONSULT-III

- 1. Connect 4WAS front control unit harness connector.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1621" or "C1622" detected?

YES >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u>.

NO >> GO TO 3.

3.CHECK INFORMATION

With CONSULT-III

Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-142.</u> "Reference Value".

Is each data the standard value?

- YES >> Check each harness connector pin terminal for disconnection.
- NO >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u>.

Component Inspection (4WAS Front Motor)

1.CHECK 4WAS FRONT MOTOR

1. Turn the ignition switch OFF.

2. Disconnect 4WAS front actuator harness connector.

3. Check the resistance between 4WAS front actuator harness connectors.

	Resistance			
Connector	Terminal	Connector	Terminal	(Approx.)
	1		5	
M351	1	M351	6	0.1 – 1 Ω
	5		6	

4. Check the continuity between 4WAS front actuator harness connector and the ground.

C1621, C1622 4WAS FRONT ACTUATOR

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

	4WAS front actuator		-	А
Connector	Terminal	Continuity		
	1 – Ground		-	
M351	5 – Ground	Not existed		В
	6 – Ground			
Is the inspection	on result normal?		-	С
	SPECTION END			
-	eplace 4WAS front actuator. Refer	to <u>STC-179</u>	"Removal and Installation".	
Special Re	pair Requirement		INFOID:00000001666310	D
• Perform 4W		r replacing	4WAS front actuator. Refer to <u>STC-28, "4WAS</u> : Special Repair Requirement (Pattern 2)".	E
	PLACING 4WAS FRONT CON self-diagnosis results (history).		-	F
CAUTION: • Never era after diag	se the memory (history) of self-d nosis.	-	esults when replacing 4WAS front control unit	ST
	e memory of the self-diagnosis re ATA MONITOR".	esults (reco	ord) after printing out or recording all the val-	
				Н
	LACING 4WAS FRONT CONTR		WAS front control unit. Refer to STC-28, "4WAS	
			Special Repair Requirement (Pattern 3)".	
				J
				K
				L
				N
				N
				С
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C1627 4WAS FRONT ACTUATOR

< COMPONENT DIAGNOSIS >

C1627 4WAS FRONT ACTUATOR

Description

IWITH 4WAS1

- Wiring connected to 4WAS front actuator is integrated with 4WAS front actuator.
- 4WAS front actuator rotates together with steering wheel.
- 4WAS front actuator mainly consists of five components. [4WAS front lock solenoid valve (lock structure), front wheel steering angle sensor, 4WAS front motor, gear shaft, and spiral cable]
- 4WAS front lock solenoid valve (lock structure) is controlled by the 4WAS front control unit, and locks/ unlocks 4WAS front actuator.
- If a strong force (rotation direction) is applied to 4WAS front actuator, the locking mechanism (holder) absorbs the force and locks 4WAS front actuator.
- Front wheel steering angle sensor detects a turning angle of 4WAS front motor.
- 4WAS front motor controls number of revolutions by a command value from the 4WAS front control unit.
- Gear shaft is an output axis of 4WAS front motor. (Gear shaft = 4WAS front motor revolution + steering angle)
- Spiral cables mean the power line and signal lines of 4WAS front motor.

DTC Logic

INFOID:000000001666312

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1627	ACTUATOR	The indication value from 4WAS front actuator (front wheel angle) differs from the value from 4WAS front control unit.	4WAS front actuator error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Start the engine. CAUTION:

Stop the vehicle.

2. Steer 360° leftward slowly. Then steer 360° rightward to return the steering wheel to the straight-ahead position. Repeat the same service for 1 minute or more.

NOTE:

The protection function mode (overheat protection) activates and the system stops if steering repeats for a long time.

3. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1627" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-50, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001666313

1.PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

With CONSULT-III

Perform 4WAS front control unit self-diagnosis

Is any DTC detected other than "C1627"?

- YES >> Check the error system.
- NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

With CONSULT-III Perform 4WAS front control unit self-diagnosis.

Is DTC "C1627" detected?

C1627 4WAS FRONT ACTUATOR

< COMPONENT DIAGNOSIS > [V	WITH 4WAS]
YES >> Replace 4WAS front actuator. Refer to <u>STC-179. "Removal and Installation"</u> . NO >> GO TO 3.	A
3. CHECK INFORMATION	
With CONSULT-III Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Reference Value".	er to <u>STC-142,</u> ^B
Is each data the standard value?	C
 YES >> Check each harness connector pin terminal for disconnection. NO >> Replace 4WAS front actuator. Refer to <u>STC-179, "Removal and Installation"</u>. 	С
Special Repair Requirement	INFOID:000000001666314
AFTER REPLACING 4WAS FRONT ACTUATOR • Perform 4WAS front actuator adjustment after replacing 4WAS front actuator. Refer to <u>ST</u> <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Particular Content in Content Content Content in Content C</u>	
AFTER REPLACING 4WAS FRONT CONTROL UNIT	

 Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28, "4WAS</u> F <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)"</u>.

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C1628 4WAS FRONT ACTUATOR

< COMPONENT DIAGNOSIS >

C1628 4WAS FRONT ACTUATOR

Description

IWITH 4WAS1

- Wiring connected to 4WAS front actuator is integrated with 4WAS front actuator.
- 4WAS front actuator rotates together with steering wheel.
- 4WAS front actuator mainly consists of five components. [4WAS front lock solenoid valve (lock structure), front wheel steering angle sensor, 4WAS front motor, gear shaft, and spiral cable]
- 4WAS front lock solenoid valve (lock structure) is controlled by the 4WAS front control unit, and locks/ unlocks 4WAS front actuator.
- If a strong force (rotation direction) is applied to 4WAS front actuator, the locking mechanism (holder) absorbs the force and locks 4WAS front actuator.
- Front wheel steering angle sensor detects a turning angle of 4WAS front motor.
- 4WAS front motor controls number of revolutions by a command value from the 4WAS front control unit.
- Gear shaft is an output axis of 4WAS front motor. (Gear shaft = 4WAS front motor revolution + steering angle)
- Spiral cables mean the power line and signal lines of 4WAS front motor.

DTC Logic

INFOID:000000001666316

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1628	ACTUATOR	The front wheel steering angle sensor error is detected.	Front wheel steering an- gle sensor error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

Start the engine.
 CAUTION:

Stop the vehicle.

Steer 360° leftward slowly. Then steer 360° rightward to return the steering wheel to the straight-ahead position. Repeat the same service for 1 minute or more.
 NOTE:

The protection function mode (overheat protection) activates and the system stops if steering repeats for a long time.

3. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1628" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-52, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001666317

1.CHECK FRONT WHEEL STEERING ANGLE SENSOR CIRCUIT (1)

- 1. Turn the ignition switch OFF.
- 2. Disconnect 4WAS front control unit harness connector.
- 3. Check the continuity between 4WAS front control unit harness connector and the ground.

	Continuity	
Connector	Continuity	
M42	18 – Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the harnesses and connectors.

STC-52

[WITH 4WAS] < COMPONENT DIAGNOSIS > **2.**CHECK FRONT WHEEL STEERING ANGLE SENSOR CIRCUIT (2) А 1. Connect 4WAS front control unit harness connector. 2. Turn the ignition switch ON. **CAUTION:** В Never start the engine. Check the continuity between 4WAS front actuator harness connector and 4WAS front control unit harness connector. 4WAS front actuator 4WAS front control unit Continuity Connector Terminal Connector Terminal D 7 M351 M42 18 Existed Is the inspection result normal? YES >> GO TO 3. Е NO >> Replace 4WAS front control unit. Refer to STC-177, "Exploded View". ${f 3.}$ CHECK FRONT WHEEL STEERING ANGLE SENSOR CIRCUIT (3) 1. Start the engine. CAUTION: Stop the vehicle. 2. Steer to the straight-ahead position. Then turn the ignition switch OFF. STC 3. Disconnect 4WAS front actuator harness connector. 4. Apply 12 V current between 4WAS front actuator harness connector No. 10 terminal (positive) and NO. 3 terminal (negative). (Release the lock structure.) Н **CAUTION:** · Never make the terminals short. Connect the fuse between the terminals when applying the voltage. 5. Slowly steer rightward and leftward alternately. Check the resistance between 4WAS front actuator harness connectors. CAUTION: The steering angle must be within 10° rightward and leftward. 4WAS front actuator Resistance (Approx.) Terminal Terminal Κ Connector Connector 2 7 M351 4 M351 7 1 k – 100 kΩ 7 8 Is the inspection result normal? YES >> GO TO 4. M NO >> Replace 4WAS front actuator. Refer to STC-179, "Removal and Installation". ${f 4.}$ CHECK FRONT WHEEL STEERING ANGLE SENSOR SIGNAL Ν (P)With CONSULT-III 1. Connect 4WAS front actuator harness connector. 2. Start the engine. **CAUTION:** Stop the vehicle. 3. Rotate the steering wheel slowly. Check "MTR SEN U OUT", "MTR SEN V OUT" and "MTR SEN W OUT" item on "DATA MONITOR" of 4WAS front control unit. Ρ Do all data monitor values indicate "Hi" or "Low" simultaneously? YES >> Replace 4WAS front control unit. Refer to STC-177, "Exploded View". NO >> Check 4WAS front actuator harness connector pin terminal for disconnection. Component Inspection (Front Wheel Steering Angle Sensor) INFOID:000000001666318 **1.**CHECK FRONT WHEEL STEERING ANGLE SENSOR

C1628 4WAS FRONT ACTUATOR

C1628 4WAS FRONT ACTUATOR

< COMPONENT DIAGNOSIS >

1. Start the engine. CAUTION: Stop the vehicle.

- 2. Steer to the straight-ahead position. Then turn the ignition switch OFF.
- 3. Disconnect 4WAS front actuator harness connector.
- 4. Apply 12 V current between 4WAS front actuator harness connector No. 10 terminal (positive) and NO. 3 terminal (negative). (Release the lock structure.)

CAUTION:

- Never make the terminals short.
- Connect the fuse between the terminals when applying the voltage.
- 5. Slowly steer rightward and leftward alternately. Check the resistance between 4WAS front actuator harness connectors.

CAUTION:

The steering angle must be within 10° rightward and leftward.

4WAS front actuator				Resistance (Ap-
Connector	Terminal	Connector	Terminal	prox.)
	2		7	
M351	4	M351	7	1 k – 100 kΩ
	8		7	

6. Connect 4WAS front actuator harness connector.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace 4WAS front actuator. Refer to <u>STC-179, "Removal and Installation"</u>.

Special Repair Requirement

INFOID:000000001666319

AFTER REPLACING 4WAS FRONT ACTUATOR

• Perform 4WAS front actuator adjustment after replacing 4WAS front actuator. Refer to <u>STC-28. "4WAS</u> <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 2)"</u>.

BEFORE REPLACING 4WAS FRONT CONTROL UNIT

- Record the self-diagnosis results (history).
 CAUTION:
- Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit
- after diagnosis.
- Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

AFTER REPLACING 4WAS FRONT CONTROL UNIT

• Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28</u>, "4WAS <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)"</u>.

C1631, C1632 4WAS FRONT CONTROL UNIT

< COMPONENT DIAGNOSIS >

C1631, C1632 4WAS FRONT CONTROL UNIT

Description

• Each sensor signal controls 4WAS front actuator.

- The fail-safe functions stops the rear wheel angle function (the front wheel is the steering wheel cutting angle) when the electric components and the mechanical components are malfunctioning.
- The protection function mode stops 4WAS system intermittently when 4WAS system continues high loaded condition and overheat condition or the input signal does not transmit to 4WAS front control unit.
- 4WAS front control unit and 4WAS main control unit control the 4WAS system by 4WAS communication line to optimize control.

DTC Logic

INFOID:000000001666321

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause	
C1631	CONTROL UNIT	An error is detected inside 4WAS front control unit.	4WAS front control unit or 4WAS front control unit power supply error is de-	F
			tected.	STC
C1632	CONTROL UNIT	An error is detected inside 4WAS front control unit.	4WAS front control unit or 4WAS front control unit power supply error is de- tected.	Н

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC	
 With CONSULT-III 1. Turn the ignition switch from OFF to ON. 2. Perform 4WAS front control unit self-diagnosis. 	J
Is DTC "C1631" or "C1632" detected?	
YES >> Proceed to diagnosis procedure. Refer to <u>STC-55, "Diagnosis Procedure"</u> . NO >> INSPECTION END	Κ
Diagnosis Procedure	
1. CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY	L
 Turn the ignition switch OFF. Disconnect 4WAS front control unit harness connector. Check the voltage between 4WAS front control unit harness connector terminal and ground. 	Μ
4WAS front control unit	Ν

4	WAS front control unit	Voltage (Approx.)	
Connector Terminal		Vollage (Applox.)	
M41	11 – Ground	Battery voltage	
M42	15 – Ground	0 V	

4. Turn the ignition switch ON. CAUTION:

Never start the engine.

5. Check the voltage between 4WAS front control unit harness connector terminal and ground.

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INFOID:000000001666320

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C1631, C1632 4WAS FRONT CONTROL UNIT

< COMPONENT DIAGNOSIS >

4	WAS front control unit	Voltage (Approx.)	
Connector Terminal		Voltage (Approx.)	
M41	11 – Ground	Battery voltage	
M42	15 – Ground	- Dattery voltage	

Is the inspection result normal?

YES >> GO TO 2. NO >> Check th

- >> Check the following items. Repair or replace the malfunctioning parts.
 - 40A fusible link (#I) open
 - Short among 40A fusible link (#I) connector, 4WAS front control unit harness connector No. 11 terminal and the ground
 - Open between the battery and 4WAS front control unit harness connector No. 11 terminal
 - 10A fuse (#3) open
 - Short among 10A fuse (#3) connector, 4WAS front control unit harness connector No. 15 terminal and the ground
 - Short among 10A fuse (#3) connector, unified meter and A/C amp harness connector No. 53 terminal and the ground
 - Open between the ignition switch and 4WAS front control unit harness connector No. 15 terminal
 - Battery or ignition switch

2.CHECK 4WAS FRONT CONTROL UNIT GROUND

Check the continuity between 4WAS front control unit harness connector terminal and the ground.

	Continuity	
Connector	Terminal	Continuity
M41	12 – Ground	
M42	18 – Ground	Existed
10142	34 – Ground	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the harnesses and connectors.

3.CHECK TERMINAL

Check 4WAS front control unit harness connector pin terminal and connection for disconnection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the specific malfunctioning part.

4.CHECK INFORMATION

• Check that any item below is applicable when the malfunctions occur.

- The engine stall occurs while driving or stopping the vehicle.

When detecting the charging system error

Is the item applicable?

- YES >> Check the error system.
 - Perform ECM symptom diagnosis. Refer to EC-589, "Symptom Table".
 - Perform the symptom diagnosis for the charging system. Refer to STC-168. "Symptom Table".
- NO >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u>.

Special Repair Requirement

INFOID:000000001666323

BEFORE REPLACING 4WAS FRONT CONTROL UNIT

- Record the self-diagnosis results (history).
 CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit after diagnosis.

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C1631, C1632 4WAS FRONT CONTROL UNIT	
< COMPONENT DIAGNOSIS > [WITH 4WAS	ار
 Erase the memory of the self-diagnosis results (record) after printing out or recording all the vaues of "DATA MONITOR". 	I -
AFTER REPLACING 4WAS FRONT CONTROL UNIT	
 Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to STC-28, "4WA 	S
FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)"	
	_

< COMPONENT DIAGNOSIS >

C1633 4WAS FRONT CONTROL UNIT

Description

- Each sensor signal controls 4WAS front actuator.
- The fail-safe functions stops the rear wheel angle function (the front wheel is the steering wheel cutting angle) when the electric components and the mechanical components are malfunctioning.
- The protection function stops 4WAS system temporarily when:
- 4WAS system continues being high load/overheat condition.
- The input signal is not transmitted to 4WAS front control unit.
- 4WAS front control unit and 4WAS main control unit control the 4WAS system by 4WAS communication line to optimize control.

DTC Logic

INFOID:000000001666325

INFOID:000000001666326

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1633	CONTROL UNIT	An error is detected inside 4WAS front control unit.	4WAS front control unit error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1633" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-58, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.CHECK 4WAS FRONT CONTROL UNIT (1)

With CONSULT-III

1. Start the engine.

CAUTION:

Stop the vehicle.

- 2. Check "THERM TEMP" on DATA MONITOR of 4WAS front control unit.
- 3. Steer the steering wheel 360° leftward slowly and then steer 360° rightward. Return the steering wheel to the straight-ahead position. Repeat the same service for 3 minutes.
- 4. Check "THERM TEMP" on DATA MONITOR of 4WAS front control unit.
- Is DATA MONITOR value difference between before and after the service 3° or less?
- YES >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u>.

NO >> GO TO 2.

2.CHECK 4WAS FRONT CONTROL UNIT (2)

With CONSULT-III

1. Start the engine.

CAUTION:

Stop the vehicle.

- 2. Check "THERM TEMP" item on "DATA MONITOR" of 4WAS front control unit.
- 3. Steer the steering wheel 360° leftward slowly and then steer 360° rightward. Return the steering wheel to the straight-ahead position. Repeat the same service for 3 minutes.
- 4. Check "THERM TEMP" item on "DATA MONITOR" of 4WAS front control unit.

STC-58

C1633 4WAS FRONT CONTROL UNIT

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

Monitor item	Condition	Display value	
THERM TEMP	Engine running (idling)	_40 − 100°C	
the inspection			
YES >> GO T NO >> Repl		efer to STC-177, "Exploded View".	
.CHECK INFO		ser to <u>oro-nn, Exploded view</u> .	
	item below is applicable when	malfunction occurs	
Entering and ex	kiting the garage (Frequent stee	ering)	
0	the steering wheel for a long tir	ne	
<u>the item applic</u> (ES >> 4WA		ode (overheat protection)(4WAS system tempor	arv stop)
		efer to <u>STC-177, "Exploded View"</u> .	ary stop)
pecial Repa	ir Requirement		INFOID:0000000001666327
•			
	ACING 4WAS FRONT CON -diagnosis results (history).	TROL UNIT	
CAUTION:	-ulagriosis results (mistory).		
		diagnosis results when replacing 4WAS front	t control unit
after diagnos		esults (record) after printing out or recordin	q all the val-
	A MONITOR".		0
ues of "DAT/ TER REPLA	A MONITOR". CING 4WAS FRONT CONTI	ROLUNIT	-
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROLUNIT	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>
ues of "DATA TER REPLA Perform 4WAS	A MONITOR". CING 4WAS FRONT CONTI front actuator adjustment after	ROL UNIT r replacing 4WAS front control unit. Refer to <u>ST</u>	<u>C-28, "4WAS</u>

< COMPONENT DIAGNOSIS >

C1651 IGNITION POWER SUPPLY

Description

• 4WAS system function is controlled by transmitting the ignition switch signal to 4WAS front control unit.

DTC Logic

INFOID:000000001666329

INFOID:000000001666330

INFOID:000000001666328

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1651	IGN POWER SUPPLY	The ignition voltage signal error is detected.	4WAS front control unit or the ignition power supply error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1651" detected?

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

Diagnosis Procedure

1.CHECK 4WAS FRONT CONTROL UNIT GROUND

1. Turn the ignition switch OFF.

2. Check the continuity between 4WAS front control unit harness connector and the ground.

	4WAS front control unit		
Connector	Connector Terminal		
M42	18 – Ground	Existed	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the harnesses and connectors.

2.CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY

1. Start the engine. CAUTION:

Stop the vehicle.

2. Check the voltage between 4WAS front control unit harness connectors.

4WAS front control unit		Voltage (Approx.)
Connector		
M42	15 – 18	Battery voltage

Is the measurement value "9 V" or less?

YES >> Check the following items. Repair or replace the malfunctioning parts.

- 4WAS front control unit harness connector pin terminal and connection
- 10A fuse (#3) open
- Short among 10A fuse (#3) connector, 4WAS front control unit harness connector No. 15 terminal and the ground
- Short among 10A fuse (#3) connector, unified meter and A/C amp No. 53 terminal and the ground

STC-60

C1651 IGNITION POWER SUPPLY

C1651 IGNITION POWER SUPPLY	
< COMPONENT DIAGNOSIS > [WITH 4WAS]	
 Open between the ignition switch and 4WAS front control unit harness connector No. 15 termi- nal Ignition switch NO >> GO TO 3. 	/
3. CHECK 4WAS FRONT CONTROL UNIT SIGNAL	E
 With CONSULT-III Start the engine. CAUTION: Stop the vehicle. Check "IGN VOLT" item on "DATA MONITOR" of 4WAS front control unit. Does the item on "DATA MONITOR" indicate "16 V" or more? YES >> Perform the symptom diagnosis for the charging system. Refer to <u>STC-168, "Symptom Table"</u>. 	(
NO >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u> .	
Special Repair Requirement	L
 BEFORE REPLACING 4WAS FRONT CONTROL UNIT Record the self-diagnosis results (history). CAUTION: 	
 Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit after diagnosis. Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR". 	S
AFTER REPLACING 4WAS FRONT CONTROL UNIT • Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28, "4WAS</u> <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)"</u> .	ŀ
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C1652 4WAS FRONT MOTOR POWER SUPPLY

< COMPONENT DIAGNOSIS >

C1652 4WAS FRONT MOTOR POWER SUPPLY

Description

• The power supply for 4WAS front motor and 4WAS front control unit.

DTC Logic

INFOID:000000001666333

INFOID:000000001666332

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1652	MOTOR POWER SUPPLY	4WAS front motor main power supply error is detected	4WAS front control unit or 4WAS front motor power supply error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1652" detected?

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

Diagnosis Procedure

1.4WAS FRONT MOTOR GROUND INSPECTION

1. Turn the ignition switch OFF.

2. Check the continuity between 4WAS front control unit harness connector and the ground.

	4WAS front control unit		
Connector	Connector Terminal		
M41	12 – Ground	Existed	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the harnesses and connectors.

2.4was front motor power supply inspection

1. Start the engine. CAUTION:

Stop the vehicle.

2. Check the voltage between 4WAS front control unit harness connectors.

4WAS front control unit		Voltage (Approx.)
Connector		
M41	11 – 12	Battery voltage

Is the measurement value "9 V" or less?

YES >> Check the following items. Repair or replace the malfunctioning parts.

4WAS front control unit harness connector pin terminal and connection

- 40A fusible link (#I) open
- Short among 40A fusible link (#I) connector, 4WAS front control unit harness connector No. 11 terminal and the ground
- Open between the battery and 4WAS front control unit harness connector No. 11 terminal
- Battery

STC-62

INFOID:000000001666334

[WITH 4WAS]

C1652 4WAS FRONT MOTOR POWER SUPPLY

G 1052 4WAS FRONT MOTOR POWER SUPPLY	
< COMPONENT DIAGNOSIS > [WITH 4WAS]	
NO >> GO TO 3.	
3.4WAS FRONT CONTROL UNIT SIGNAL INSPECTION	А
With CONSULT-III	
1. Start the engine.	В
Stop the vehicle.	
2. Check "MOTOR VOLT" item on "DATA MONITOR" of 4WAS front control unit.	
Does the item on "DATA MONITOR" indicate "16 V" or more?	С
 YES >> Perform the symptom diagnosis for the charging system. Refer to <u>STC-168. "Symptom Table"</u>. NO >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u>. 	
Special Repair Requirement	D
BEFORE REPLACING 4WAS FRONT CONTROL UNIT • Record the self-diagnosis results (history). CAUTION:	E
• Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit after diagnosis.	F
 Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR". 	
AFTER REPLACING 4WAS FRONT CONTROL UNIT	ST
• Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28, "4WAS</u> <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)"</u> .	

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< COMPONENT DIAGNOSIS >

C1654 4WAS FRONT ACTUATOR RELAY

Description

- It performs control inside 4WAS front control unit.
- The actuator relay turns ON when turning the ignition switch ON.
- When turning the ignition switch from ON to OFF, the actuator relay remains ON and is turned OFF after a few minutes due to the 4WAS front control unit control.

DTC Logic

INFOID:000000001666337

INFOID:000000001666338

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1654	ACTUATOR RELAY	An error is detected on the main relay power supply in- side 4WAS front control unit.	The main relay power supply inside 4WAS front control unit error is de- tected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- 1. Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1654" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-64, "Diagnosis Procedure"</u>.
- NO >> INSPECTION ĔND

Diagnosis Procedure

1.4WAS FRONT MOTOR GROUND INSPECTION

- 1. Turn the ignition switch OFF.
- 2. Check the continuity between 4WAS front control unit harness connector and the ground.

4WAS front control unit		Continuity
Connector	Continuity	
M41	12 – Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the harnesses and connectors.

2.4was front motor power supply inspection

1. Start the engine. CAUTION:

Stop the vehicle.

2. Check the voltage between 4WAS front control unit harness connectors.

4WAS front control unit		Voltage (Approx.)
Connector Terminal		vollage (Applox.)
M41	11 – 12	Battery voltage

Is the measurement value "9 V" or less?

YES >> Check the following items. Repair or replace the malfunctioning parts.

4WAS front control unit harness connector pin terminal and connection

• 40A fusible link (#I) open

STC-64

C1654 4WAS FRONT ACTUATOR RELAY

CT054 4WAS FRONT ACTUATOR RELAT	
< COMPONENT DIAGNOSIS >	[WITH 4WAS]
 Short among 40A fusible link (#I) connector, 4WAS front control unit harness control and the ground 	nnector No. 11
terminal and the groundOpen between the battery and 4WAS front control unit harness connector No. 11	terminal
Battery	
NO >> GO TO 3.	
.4WAS FRONT CONTROL UNIT SIGNAL INSPECTION	
With CONSULT-III Start the engine.	
CAUTION:	
Stop the vehicle. Check "MOTOR VOLT" item on "DATA MONITOR" of 4WAS front control unit.	
bes the item on "DATA MONITOR" indicate "16 V" or more?	
/ES >> Perform the symptom diagnosis for the charging system. Refer to <u>STC-168, "Symp</u>	otom Table".
IO >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u> .	
pecial Repair Requirement	INFOID:000000001666339
FORE REPLACING 4WAS FRONT CONTROL UNIT	
Record the self-diagnosis results (history).	
CAUTION:	
 Never erase the memory (history) of self-diagnosis results when replacing 4WAS fro after diagnosis. 	nt control unit
• Erase the memory of the self-diagnosis results (record) after printing out or record	ing all the val-
FTER REPLACING 4WAS FRONT CONTROL UNIT Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to S	TC-28 "4WAS
FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pa	

< COMPONENT DIAGNOSIS >

C1655 4WAS FRONT DRIVER

Description

- It perform control inside 4WAS front control unit.
- The power supply for 4WAS front motor (3-phase motor).

DTC Logic

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1655	PRE-DRIVER	4WAS front motor 3-phase current error is detected. (Current is not applied to 4WAS front motor)	4WAS front control unit or 4WAS front motor power supply error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

(B) With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1655" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>STC-66, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK 4WAS FRONT MOTOR GROUND

1. Turn the ignition switch OFF.

- 2. Disconnect 4WAS front control unit harness connector.
- 3. Check the continuity between 4WAS front control unit harness connector and the ground.

	Continuity	
Connector	Continuity	
M41	12 – Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the harnesses and connectors.

2.PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

With CONSULT-III

- 1. Connect 4WAS front control unit harness connector.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1622" detected?

YES >> Check the error system.

NO >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u>.

Special Repair Requirement

BEFORE REPLACING 4WAS FRONT CONTROL UNIT

- Record the self-diagnosis results (history).
- CAUTION:
- Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit after diagnosis.

STC-66

INFOID:000000001666343

INFOID:000000001666341

INFOID:000000001666340

C1655 4WAS FRONT DRIVER

< COMPONENT DIAGNOSIS >	[WITH 4WAS]
 Erase the memory of the self-diagnosis results (record) after printing out or recor- ues of "DATA MONITOR". 	ding all the val-
AFTER REPLACING 4WAS FRONT CONTROL UNIT • Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (I</u>	<u>STC-28, "4WAS</u> Pattern <u>3)"</u> . B
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C1661 4WAS FRONT LOCK SOLENOID VALVE

< COMPONENT DIAGNOSIS >

C1661 4WAS FRONT LOCK SOLENOID VALVE

Description

INFOID:000000001666344

IWITH 4WAS1

- Secure the inside of 4WAS front actuator temporarily. (It operates when performing active test with fail-safe function and CONSULT-III.)
- 4WAS front lock solenoid value is activated in the active test (lock release). The secured 4WAS front actuator is released.
- 4WAS front control unit controls 4WAS front actuator. 4WAS front actuator releases the lock when the engine speed signal is "ON". 4WAS front actuator applies the lock when the engine speed signal is "OFF".

DTC Logic

INFOID:000000001666345

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1661	LOCK SOLENOID	4WAS front lock solenoid valve error is detected. (An electric activation error is detected.)	4WAS front control unit or 4WAS front lock solenoid valve error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1661" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-68, "Diagnosis Procedure"</u>.
- NO >> INSPECTION ĔND

Diagnosis Procedure

INFOID:000000001666346

1.CHECK 4WAS FRONT SOLENOID VALVE CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect 4WAS front actuator harness connector.
- 3. Check the resistance between 4WAS front actuator harness connectors.

	Resistance					
Connector	Connector Terminal Connector Terminal					
M351	10	M351	3	1 – 100 Ω		

4. Check the continuity between 4WAS front actuator harness connector and the ground.

	Continuity			
Connector	Connector Terminal			
M351	3 – Ground	Not existed		
101331	10 – Ground	NUL EXISTED		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace 4WAS front actuator. Refer to <u>STC-179, "Removal and Installation"</u>.

2. CHECK INFORMATION

BWith CONSULT-III

- 1. Connect 4WAS front actuator harness connector.
- Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-142, "Reference Value"</u>.

STC-68

	С	1661 4WA	S FROM		SOLENOID VALVE		
< COMPON						[WITH 4WAS]	
	Check each	harness con			isconnection. 77, "Exploded View".		A
	•				noid Valve)	INFOID:000000001666347	В
1. CHECK 4	WAS FROM	IT SOLENOI	D VALVE C	IRCUIT			
2. Disconn		ont actuator l			ess connectors.		C
	4WAS fro	nt actuator		Resistance			
Connector	Terminal	Connector	Terminal	(Approx.)			
M351	10	M351	3	1 – 100 Ω			E
4. Check th	ne continuity	between 4W	AS front ac	ctuator harne	ss connector and the grou	nd.	
	AWAS fro	nt actuator					F
Connector	407.0110	Terminal		Continuity			
		3 – Ground					S
M351			Not existed			3	
Is the inspec	tion result n	ormal?					
	INSPECTIO						ŀ
_	•		ator. Refer	to <u>STC-179,</u>	"Removal and Installation	<u>.</u> .	
Special Re	epair Req	uirement				INFOID:000000001666348	
AFTER REI	PLACING 4			TOR			
• Perform 4	WAS front a	actuator adju	stment afte	er replacing	4WAS front actuator. Refe : Special Repair Requirem		
BEFORE R	EPLACING	4WAS FRO		TROL UNIT			
		sis results (h	istory).				
• Never er		mory (histor	y) of self-c	diagnosis re	sults when replacing 4W	AS front control unit	
after dia	gnosis.			-			
	DATA MONI		lagnosis re	esuits (reco	rd) after printing out or	recording all the val-	
AFTER REI	PLACING 4			ROL UNIT			
					VAS front control unit. Ret : Special Repair Requirem		ſ
							(

C1667 LOCK INSERTION

< COMPONENT DIAGNOSIS >

C1667 LOCK INSERTION

Description

INFOID:000000001666349

IWITH 4WAS1

- Wiring connected to 4WAS front actuator is integrated with 4WAS front actuator.
- 4WAS front actuator rotates together with steering wheel.
- 4WAS front actuator mainly consists of five components. [4WAS front lock solenoid valve (lock structure), front wheel steering angle sensor, 4WAS front motor, gear shaft, and spiral cable]
- 4WAS front lock solenoid valve (lock structure) is controlled by the 4WAS front control unit, and locks/ unlocks 4WAS front actuator.
- If a strong force (rotation direction) is applied to 4WAS front actuator, the locking mechanism (holder) absorbs the force and locks 4WAS front actuator.
- Front wheel steering angle sensor detects a turning angle of 4WAS front motor.
- 4WAS front motor controls number of revolutions by a command value from the 4WAS front control unit.
- Gear shaft is an output axis of 4WAS front motor. (Gear shaft = 4WAS front motor revolution + steering angle)
- Spiral cables mean the power line and signal lines of 4WAS front motor.

DTC Logic

INFOID:000000001666350

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1667	LOCK INSERTION	4WAS front lock solenoid valve (lock) error is detected. (An error is detected in lock condition.)	The inside 4WAS front actuator error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

Start the engine.
 CAUTION:

Stop the vehicle.

- 2. Steer 30° leftward slowly. Steer 30° rightward. Return the steering wheel to the straight-ahead position.
- 3. Turn the ignition switch OFF.
- 4. Turn the ignition switch ON.
- 5. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1667" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-70, "Diagnosis Procedure"</u>.
- NO >> INSPECTION ĔND

Diagnosis Procedure

INFOID:000000001666351

1.CHECK 4WAS FRONT LOCK SOLENOID VALVE (LOCK STRUCTURE)

With CONSULT-III

1. Start the engine. CAUTION:

Stop the vehicle.

- 2. Steer 30° leftward slowly. Steer 30° rightward. Return the steering wheel to the straight-ahead position.
- 3. Turn the ignition switch OFF.
- 4. Turn the ignition switch ON.
- 5. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1667" detected?

YES >> Replace 4WAS front actuator. Refer to <u>STC-179, "Removal and Installation"</u>.

NO >> GO TO 2.

2. CHECK INFORMATION

With CONSULT-III

C1667 LOCK INSERTION

[WITH 4WAS] < COMPONENT DIAGNOSIS > 1. Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to STC-142, "Reference Value". А 2. Perform 4WAS front control unit self-diagnosis. Is each data the standard value? YES >> GO TO 1. В NO >> Replace 4WAS front control unit. Refer to STC-177, "Exploded View". Special Repair Requirement INFOID:000000001666352 С AFTER REPLACING 4WAS FRONT ACTUATOR • Perform 4WAS front actuator adjustment after replacing 4WAS front actuator. Refer to STC-28, "4WAS D FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 2)".

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C1668 LOCK HOLDER GAP DETECT

< COMPONENT DIAGNOSIS >

C1668 LOCK HOLDER GAP DETECT

Description

INFOID:000000001666353

- Wiring connected to 4WAS front actuator is integrated with 4WAS front actuator.
- 4WAS front actuator rotates together with steering wheel.
- 4WAS front actuator mainly consists of five components. [4WAS front lock solenoid valve (lock structure), front wheel steering angle sensor, 4WAS front motor, gear shaft, and spiral cable]
- 4WAS front lock solenoid valve (lock structure) is controlled by the 4WAS front control unit, and locks/ unlocks 4WAS front actuator.
- If a strong force (rotation direction) is applied to 4WAS front actuator, the locking mechanism (holder) absorbs the force and locks 4WAS front actuator.
- Front wheel steering angle sensor detects a turning angle of 4WAS front motor.
- 4WAS front motor controls number of revolutions by a command value from the 4WAS front control unit.
- Gear shaft is an output axis of 4WAS front motor. (Gear shaft = 4WAS front motor revolution + steering angle)
- Spiral cables mean the power line and signal lines of 4WAS front motor.

DTC Logic

INFOID:000000001666354

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1668	LOCK HLD GAP DETCT	4WAS front lock solenoid valve (lock) error is detected. (Excessive force is applied to the lock.)	The inside 4WAS front actuator error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1668" detected?

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

NO >> INSPECTION END

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

With CONSULT-III

- 1. Start the engine. CAUTION: Stop the vehicle.
- Perform 4WAS front control unit self-diagnosis. Check that DTC "C1668" is detected.
- CAUTION:
 - Replace 4WAS front actuator when the diagnosis history remains.
 - Never repair the malfunctioning part in 4WAS front actuator adjustment without replacing 4WAS front actuator.

>> Replace 4WAS front actuator. Refer to STC-168, "Symptom Table".

Special Repair Requirement

AFTER REPLACING 4WAS FRONT ACTUATOR

• Perform 4WAS front actuator adjustment after replacing 4WAS front actuator. Refer to <u>STC-28</u>, "4WAS <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 2)"</u>.

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IWITH 4WAS1

C1669 INCOMPLETE LOCK RELEASE

< COMPONENT DIAGNOSIS >

C1669 INCOMPLETE LOCK RELEASE

Description

- Wiring connected to 4WAS front actuator is integrated with 4WAS front actuator.
- 4WAS front actuator rotates together with steering wheel.
- 4WAS front actuator mainly consists of five components. [4WAS front lock solenoid valve (lock structure), front wheel steering angle sensor, 4WAS front motor, gear shaft, and spiral cable]
- 4WAS front lock solenoid valve (lock structure) is controlled by the 4WAS front control unit, and locks/ unlocks 4WAS front actuator.
- If a strong force (rotation direction) is applied to 4WAS front actuator, the locking mechanism (holder) absorbs the force and locks 4WAS front actuator.
- Front wheel steering angle sensor detects a turning angle of 4WAS front motor.
- 4WAS front motor controls number of revolutions by a command value from the 4WAS front control unit.
- Gear shaft is an output axis of 4WAS front motor. (Gear shaft = 4WAS front motor revolution + steering angle)
- Spiral cables mean the power line and signal lines of 4WAS front motor.

DTC Logic

DTC DETECTION LOGIC

_					STC
_	DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause	010
-	C1669	INCOMP LOCK RELEAS	4WAS front actuator error is detected. (An error is detected in unlock condition.)	The power steering oil pressure or the inside 4WAS front actuator error is detected.	Η

DTC CONFIRMATION PROCEDURE

1	.RECHECK DTC	

(P)With CONSULT-III Turn the ignition switch from OFF to ON. 1. 2. Perform 4WAS front control unit self-diagnosis. Κ Is DTC "C1669" detected? YES >> Proceed to diagnosis procedure. Refer to STC-73, "Diagnosis Procedure". >> INSPECTION END NO L Diagnosis Procedure INFOID:000000001666359 **1.**CHECK INFORMATION M Check that any item below is applicable. - The steering force is heavy when 4WAS warning lamp is ON. - The power steering system error is detected (oil leakage, belt tension, steering force etc.). Ν Is the item applicable? YES >> Perform the symptom diagnosis for the steering system. Refer to ST-3, "NVH Troubleshooting Chart". NO >> Replace 4WAS front actuator. Refer to STC-179, "Removal and Installation". Special Repair Requirement INFOID:000000001666360 P AFTER REPLACING 4WAS FRONT ACTUATOR • Perform 4WAS front actuator adjustment after replacing 4WAS front actuator. Refer to STC-28, "4WAS

FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 2)".

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C1671 ACTUATOR ADJUSTMENT NOT PERFORMED

< COMPONENT DIAGNOSIS >

C1671 ACTUATOR ADJUSTMENT NOT PERFORMED

Description

• Memorize the neutral position of 4WAS front actuator in 4WAS front control unit.

DTC Logic

INFOID:000000001666362

INFOID:000000001666363

INFOID:000000001666361

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1671	ACT ADJ NOT PRFRM	4WAS front actuator adjustment is not performed.	4WAS front actuator ad- justment is not per- formed.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1671" detected?

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

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

With CONSULT-III

Perform 4WAS front control unit self-diagnosis.

- Is any DTC other than "C1671" detected?
- YES >> Check the error system.
- NO >> GO TO 2.
- 2.4was front actuator adjustment

With CONSULT-III

- 1. Perform 4WAS front actuator adjustment. Refer to <u>STC-28, "4WAS FRONT ACTUATOR NEUTRAL</u> <u>POSITION ADJUSTMENT : Special Repair Requirement (Pattern 2)"</u>.
- 2. Perform 4WAS front control unit self-diagnosis.

Is any DTC other than "C1671" detected?

- YES >> Check the error system.
- NO >> GO TO 3.

3. PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

With CONSULT-III

Perform 4WAS front control unit self-diagnosis.

Is DTC "C1671" detected?

- YES >> Replace 4WAS front control unit. Refer to STC-177, "Exploded View".
- NO >> INSPECTION END

Special Repair Requirement

BEFORE REPLACING 4WAS FRONT CONTROL UNIT

- Record the self-diagnosis results (history).
- CAUTION:
- Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit after diagnosis.

STC-74

INFOID:000000001666364

[WITH 4WAS]

C1671 ACTUATOR ADJUSTMENT NOT PERFORMED

< COMPONENT DIAGNOSIS > [WITH 4WAS]	
• Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".	А
AFTER REPLACING 4WAS FRONT CONTROL UNIT	
• Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28, "4WAS</u> <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)"</u> .	В
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C1672 INCOMPLETE ACTUATOR ADJUSTMENT

< COMPONENT DIAGNOSIS >

C1672 INCOMPLETE ACTUATOR ADJUSTMENT

Description

• Memorize the neutral position of 4WAS front actuator in 4WAS front control unit.

DTC Logic

INFOID:000000001666366

INFOID:000000001666367

INFOID:000000001666365

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1672	INCOMP ACTUATR ADJ	4WAS front actuator adjustment is incomplete.	4WAS front actuator ad- justment is incomplete.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- 1. Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "C1672" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-76, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

BWith CONSULT-III

Perform 4WAS front control unit self-diagnosis.

Is any DTC other than "C1672" detected?

- YES >> Check the error system.
- NO >> GO TO 2.

2. ADJUST 4WAS FRONT ACTUATOR

With CONSULT-III

 Perform 4WAS front actuator adjustment. Refer to <u>STC-28, "4WAS FRONT ACTUATOR NEUTRAL</u> <u>POSITION ADJUSTMENT : Special Repair Requirement (Pattern 2)"</u>.

2. Perform 4WAS front control unit self-diagnosis.

Is any error system detected?

- YES >> Replace 4WAS front control unit. Refer to STC-177, "Exploded View".
 - Perform 4WAS actuator adjustment after replacing 4WAS front control unit. Perform the 4WAS front control unit self-diagnosis again. Replace 4WAS front actuator if DTC "C1672" is detected. Refer to <u>STC-179</u>, "Removal and Installation".
- NO >> INSPECTION END

Special Repair Requirement

INFOID:000000001666368

BEFORE REPLACING 4WAS FRONT CONTROL UNIT

- Record the self-diagnosis results (history). CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

AFTER REPLACING 4WAS FRONT CONTROL UNIT

• Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28</u>, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)".

< COMPONENT DIAGNOSIS >

C1684, C1685 4WAS MAIN CONTROL UNIT COMMUNICATION

Description

 4WAS front control unit and 4WAS main control unit transmit/receive information to/from each other for optimum control of the 4WAS system with the specified 4WAS system line (4WAS communication line) between

- 4WAS front control unit and 4WAS main control unit. • Be careful to repair wirings because 4WAS system specified line adopts twisted pair wiros. Pefer to STC
- Be careful to repair wirings because 4WAS system specified line adopts twisted-pair wires. Refer to <u>STC-176</u>, "Precautions for Harness Repair".

DTC Logic

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[WITH 4WAS]

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DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause	E
C1684	4WAS MAIN ECU COMM	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS main control unit.)	4WAS communication line*/4WAS main control unit/4WAS front control unit error	F
C1685	4WAS MAIN ECU COMM	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS main control unit.)	4WAS communication line*/4WAS main control unit/4WAS front control unit error	ST

*: Communication line between 4WAS front control unit and 4WAS main control unit

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

(P)With CONSULT-III Turn the ignition switch from OFF to ON. 1. Perform 4WAS front control unit self-diagnosis. 2. Is DTC "C1684" or "C1685" detected? YES >> Proceed to diagnosis procedure. Refer to STC-77, "Diagnosis Procedure". >> INSPECTION END NO Κ Diagnosis Procedure INFOID:000000001666371 **1.**CHECK COMMUNICATION LINE (1) L 1. Turn the ignition switch OFF. Disconnect ABS actuator and electric unit (control unit) harness connector. 2. Μ 3. Disconnect yaw rate/side G sensor harness connector.

- 4. Disconnect 4WAS front control unit harness connector.
- 5. Disconnect 4WAS main control unit harness connector.
- Check the continuity between ABS actuator and electric unit (control unit) harness connector and yaw rate/side G sensor harness connector.

	or and electric ntrol unit)	Yaw rate/sid	de G sensor.	Continuity
Connector	Terminal	Connector	Terminal	
E41	25	M143	2	Existed
L41	45	101145	3	LXISIEU

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176. "Precautions for Harness</u> <u>Repair"</u>.
- **2.**CHECK COMMUNICATION LINE (2)

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

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

ABS a	actuator and electric unit (control unit)	Continuity
Connector	Terminal	Continuity
F41	25 – Ground	Not existed
	45 – Ground	NOT EXISTED

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176</u>, "Precautions for Harness <u>Repair"</u>.

3.CHECK COMMUNICATION LINE (3)

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

ABS a	actuator and electric unit (control unit)	Continuity
Connector	Terminal	Continuity
E41	25 – 45	Not existed

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176</u>, "Precautions for Harness <u>Repair"</u>.

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

Check the continuity between ABS actuator and electric unit (control unit) connector. Refer to <u>STC-84, "Component Inspection [ABS Actuator and Electric Unit (Control Unit)]</u>".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.

5.CHECK YAW RATE/SIDE G SENSOR

Check the continuity between yaw rate/side G sensor connector. Refer to <u>BRC-62, "Component Inspection"</u>. Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace yaw rate/side G sensor. Refer to <u>BRC-104, "Exploded View"</u>.

6.CHECK CAN DIAGNOSIS SUPPORT MONITOR (4WAS FRONT CONTROL UNIT)

With CONSULT-III

- i. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect yaw rate/side G sensor harness connector.
- 3. Connect 4WAS front control unit harness connector.
- 4. Connect 4WAS main control unit harness connector.
- 5. Start the engine. CAUTION:

Stop the vehicle.

- 6. Perform CAN diagnosis support monitor of 4WAS front control unit.
- 7. Replace 4WAS main control unit error history. Refer to <u>STC-39, "CONSULT-III Function</u> [4WAS(FRONT)]".

What is the indicated item?

All items are "OK">>GO TO 7. "TRANSMIT DIAG" is other than "OK">>GO TO 7. "4WAS(MAIN)" is other than "OK">>GO TO 8.

1.CHECK 4WAS FRONT CONTROL UNIT CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect 4WAS front control unit harness connector.
- 3. Disconnect ABS actuator and electric unit (control unit) harness connector.

< COMPONENT DIAGNOSIS >

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

4WAS from	t control unit		or and electric ntrol unit)	Continuity
Connector	Terminal	Connector	Terminal	
M42	14	F41	25	Existed
IVI42	25	⊑41	45	Existed

 Check that 4WAS front control unit connector No. 14 terminal and No. 25 are connected properly and not deformed.

Is the inspection result normal?

- YES >> Replace 4WAS front control unit. Refer to STC-177, "Exploded View".
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176. "Precautions for Harness</u> E <u>Repair"</u>.

8. CHECK 4WAS MAIN CONTROL UNIT CIRCUIT

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

4WAS ma	in control unit		or and electric ntrol unit)	Continuity
Connector	Terminal	Connector	Terminal	
B54	31	E41	45	Existed
0.04	32	L41	25	LAISIEU

5. Check that 4WAS main control unit connector No. 31 terminal and No. 32 are connected properly and not deformed.

Is the inspection result normal?

- YES >> Replace 4WAS main control unit. Refer to STC-178. "Exploded View".
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176</u>, "Precautions for Harness K <u>Repair</u>".

Component Inspection [ABS Actuator and Electric Unit (Control Unit)]

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

- 1. Turn the ignition switch OFF.
- 2. Remove ABS actuator and electric unit (control unit). Refer to BRC-102. "Exploded View".
- 3. Check the resistance between ABS actuator and electric unit (control unit) connector terminals.

ABS actuator	ABS actuator and electric unit (control unit)	
Connector	Terminal	Resistance (Approx.)
E41	25 – 45	120 Ω
· · · · ·	ion result normal? NSPECTION END	
	eplace ABS actuator and e	electric unit (control u
Componen	it Inspection (Yaw Ra	ate/Side G Senso
4		

1.CHECK YAW RATE/SIDE G SENSOR

1. Turn the ignition switch OFF.

2. Remove yaw rate/side G sensor. Refer to BRC-104, "Exploded View".

3. Check the resistance between yaw rate/side G sensor connector terminals.

STC-79

INFOID:000000001666372

[WITH 4WAS]

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< COMPONENT DIAGNOSIS >

Yaw rate/side G sensor		Resistance (Approx.)
Connector	Terminal	Resistance (Approx.)
M143	2 – 3	120 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace yaw rate/side G sensor.

Special Repair Requirement

INFOID:000000001666374

BEFORE REPLACING 4WAS FRONT CONTROL UNIT

- Record the self-diagnosis results (history). CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

BEFORE REPLACING 4WAS MAIN ACTUATOR

- Record the self-diagnosis results (history). CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

AFTER REPLACING 4WAS FRONT CONTROL UNIT

• Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28, "4WAS</u> <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)"</u>.

< COMPONENT DIAGNOSIS >

C1686 4WAS MAIN CONTROL UNIT

Description

• It transmits the value calculated by 4WAS main control unit to 4WAS front control unit with 4WAS communication line (line for 4WAS system). 4WAS front control unit controls 4WAS front actuator according to the received command value.

DTC Logic

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1686	4WAS MAIN ECU	An error is detected on 4WAS main control unit side. (4WAS main control unit fail-safe mode)	4WAS main control unit fail-safe mode
TC CONFIF	RMATION PROCEDURE		
1.RECHECK	DTC		
With CONS	GULT-III	ON	
	WAS front control unit self-		
l <u>s DTC "C168(</u> YES >> Pi		lura Deferite STC 91 "Diagnosis Dresedura"	
	ISPECTION END	lure. Refer to <u>STC-81, "Diagnosis Procedure"</u> .	
Diagnosis F	Procedure		INFOID:0000000016663
1.perform	SELF-DIAGNOSIS (4WAS	S FRONT CONTROL UNIT)	
	ULT-III		
With CONS Perform 4WAS	ULT-III S front control unit self-diag	nosis.	
With CONS Perform 4WAS s any DTC otl YES >> C	GULT-III S front control unit self-diag her than "C1686" detected? heck the error system.	inosis. <u>?</u>	
With CONS Perform 4WAS s any DTC otl YES >> C	ULT-III S front control unit self-diag her than "C1686" detected?	inosis. <u>?</u>	
With CONS Perform 4WAS s any DTC otl YES >> C	GULT-III S front control unit self-diag her than "C1686" detected? heck the error system.	inosis. <u>?</u>	
With CONS Perform 4WAS s any DTC otl YES >> C	GULT-III S front control unit self-diag her than "C1686" detected? heck the error system.	inosis. <u>?</u>	
With CONS Perform 4WAS s any DTC otl YES >> C	GULT-III S front control unit self-diag her than "C1686" detected? heck the error system.	inosis. <u>?</u>	
With CONS Perform 4WAS s any DTC otl YES >> C	GULT-III S front control unit self-diag her than "C1686" detected? heck the error system.	inosis. <u>?</u>	

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< COMPONENT DIAGNOSIS >

U1000, U1002 4WAS COMMUNICATION CIRCUIT

Description

- 4WAS front control unit and 4WAS main control unit transmit/receive information to/from each other for optimum control of the 4WAS system with the specified 4WAS system line (4WAS communication line) between 4WAS front control unit and 4WAS main control unit.
- Be careful to repair wirings because 4WAS system specified line adopts twisted-pair wires. Refer to <u>STC-176. "Precautions for Harness Repair"</u>.

DTC Logic

INFOID:000000001666379

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
U1000	CAN COMM CIRCUIT	When 4WAS front control unit is not transmitting or re- ceiving 4WAS communication signal for 2 seconds or more.	4WAS communication line*/4WAS main control unit/4WAS front control unit error
U1002	SYSTEM COMM(CAN)	When 4WAS front control unit is not transmitting or re- ceiving 4WAS communication signal for 2 seconds or less.	4WAS communication line*/4WAS main control unit/4WAS front control unit error

*: Communication line between 4WAS front control unit and 4WAS main control unit

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

(B) With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "U1000" or "U1002" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-82, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001666380

1.CHECK COMMUNICATION LINE (1)

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect yaw rate/side G sensor harness connector.
- 4. Disconnect 4WAS front control unit harness connector.
- 5. Disconnect 4WAS main control unit harness connector.
- 6. Check the continuity between ABS actuator and electric unit (control unit) harness connector and yaw rate/side G sensor harness connector.

ABS actuator and electric unit (control unit)		Yaw rate/side G sensor.		Continuity
Connector	Terminal	Connector Terminal		
E41	25	M143	2	Existed
	45	101143	3	LAISIEU

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176</u>, "Precautions for Harness <u>Repair"</u>.

2.CHECK COMMUNICATION LINE (2)

INFOID:000000001878358

[WITH 4WAS] < COMPONENT DIAGNOSIS > Check the continuity between ABS actuator and electric unit (control unit) harness connector and the ground. А ABS actuator and electric unit (control unit) Continuity Connector Terminal В 25 - Ground E41 Not existed 45 - Ground Is the inspection result normal? YES >> GO TO 3. NO >> Repair or replace the harnesses and connectors. Refer to STC-176, "Precautions for Harness Repair". D ${\it 3.}$ CHECK COMMUNICATION LINE (3) Check the continuity between ABS actuator and electric unit (control unit) harness connector. Е ABS actuator and electric unit (control unit) Continuity Connector Terminal E41 25 - 45Not existed Is the inspection result normal? STC YES >> GO TO 4. NO >> Repair or replace the harnesses and connectors. Refer to STC-176, "Precautions for Harness Repair". CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) Н Check the continuity between ABS actuator and electric unit (control unit). Refer to STC-84, "Component Inspection [ABS Actuator and Electric Unit (Control Unit)]". Is the inspection result normal? YES >> GO TO 5. NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-102, "Exploded View". ${f b}.$ CHECK YAW RATE/SIDE G SENSOR

Check the continuity between yaw rate/side G sensor. Refer to STC-84, "Component Inspection (Yaw Rate/ Side G Sensor)".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace yaw rate/side G sensor. Refer to BRC-104, "Exploded View".

O.CHECK CAN DIAGNOSIS SUPPORT MONITOR (4WAS FRONT CONTROL UNIT)

(P)With CONSULT-III

- Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect yaw rate/side G sensor harness connector.
- 3. Connect 4WAS front control unit harness connector.
- 4 Connect 4WAS main control unit harness connector.
- 5. Start the engine. **CAUTION:**

Stop the vehicle.

- Perform CAN diagnosis support monitor of 4WAS front control unit.
- 7. Replace 4WAS main control unit error history. Refer to STC-39. "CONSULT-III Function [4WAS(FRONT)]". Ρ

What is the indicated item?

- All items are "OK">>GO TO 7.
- "TRANSMIT DIAG" is other than "OK">>GO TO 7.
- "4WAS(MAIN)" is other than "OK">>GO TO 8.

I.CHECK 4WAS FRONT CONTROL UNIT CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect 4WAS front control unit harness connector.

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- 3. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 4. Check the continuity between 4WAS front control unit harness connector and ABS actuator and electric unit (control unit) harness connector.

4WAS front control unit		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
M42	14	F41	25	Existed
IVI4Z	25	L41	45	LAISIEU

5. Check that 4WAS front control unit connector No. 14 terminal and No. 25 are connected properly and not deformed.

Is the inspection result normal?

- YES >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u>.
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176</u>, "Precautions for Harness <u>Repair"</u>.

8.CHECK 4WAS MAIN CONTROL UNIT CIRCUIT

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

4WAS main control unit		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector Terminal		
B54	31	F41	45	Existed
B54	32	⊑41	25	Existed

5. Check that 4WAS main control unit connector No. 31 terminal and No. 32 are connected properly and not deformed.

Is the inspection result normal?

- YES >> Replace 4WAS main control unit. Refer to STC-178, "Exploded View".
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176</u>, "Precautions for Harness <u>Repair"</u>.

Component Inspection [ABS Actuator and Electric Unit (Control Unit)]

INFOID:000000001666381

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

1. Turn the ignition switch OFF.

2. Remove ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.

3. Check the resistance between ABS actuator and electric unit (control unit) connector terminals.

ABS actuate	or and electric unit (control unit)	Resistance (Approx.)
Connector Terminal		Resistance (Approx.)
E41	25 – 45	120 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ABS actuator and electric unit (control unit).

Component Inspection (Yaw Rate/Side G Sensor)

INFOID:000000001666382

1.CHECK YAW RATE/SIDE G SENSOR

- 1. Turn the ignition switch OFF.
- Remove yaw rate/side G sensor. Refer to <u>BRC-104, "Exploded View"</u>.

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

INFOID:000000001666383

3.	Check the	resistance between	yaw rate/side G	sensor connector terminals.
----	-----------	--------------------	-----------------	-----------------------------

-	Ya	aw rate/side G sensor	Resistance (Approx.)
	Connector Terminal		Resistance (Approx.)
	M143	2 – 3	120 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace yaw rate/side G sensor.

Special Repair Requirement

BEFORE REPLACING 4WAS FRONT CONTROL UNIT

- Record the self-diagnosis results (history).
 - **CAUTION:**
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

AFTER REPLACING 4WAS FRONT CONTROL UNIT

- Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28, "4WAS</u> <u>STC FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)"</u>.
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< COMPONENT DIAGNOSIS >

U1010 4WAS COMMUNICATION CIRCUIT

Description

- 4WAS front control unit and 4WAS main control unit transmit/receive information to/from each other for optimum control of the 4WAS system with the specified 4WAS system line (4WAS communication line) between 4WAS front control unit and 4WAS main control unit.
- Be careful to repair wirings because 4WAS system specified line adopts twisted-pair wires. Refer to <u>STC-176. "Precautions for Harness Repair"</u>.

DTC Logic

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
U1010	CONTROL UNIT(CAN)	When detecting error during the initial diagnosis of 4WAS controller of 4WAS front control unit	4WAS communication line*/4WAS main control unit/4WAS front control unit error

*: Communication line between 4WAS front control unit and 4WAS main control unit

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- 1. Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS front control unit self-diagnosis.

Is DTC "U1010" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-86, "Diagnosis Procedure"</u>.
- NO >> INSPECTION ĔND

Diagnosis Procedure

1.4WAS FRONT CONTROL UNIT

Check that there is no malfunction in 4WAS front control unit harness connector or disconnection.

Is the inspection result normal?

- YES >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u>.
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176</u>, "Precautions for Harness <u>Repair"</u>.

Special Repair Requirement

INFOID:000000001666387

INFOID:000000001666386

BEFORE REPLACING 4WAS FRONT CONTROL UNIT

- Record the self-diagnosis results (history). CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

AFTER REPLACING 4WAS FRONT CONTROL UNIT

• Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28</u>, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)".

INFOID:000000001878363

INFOID:000000001666385

C1900, C1901, C1906, C1907, C1927, C1933 4WAS MAIN CONTROL UNIT < COMPONENT DIAGNOSIS > [WITH 4WAS]

C1900, C1901, C1906, C1907, C1927, C1933 4WAS MAIN CONTROL UNIT

Description

INFOID:000000001666388

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- 4WAS rear actuator and the power steering solenoid valve is controlled by each sensor signal.
- The fail-safe functions stops the rear wheel angle function (the front wheel is the steering wheel cutting angle) when the electric components and the mechanical components are malfunctioning.
- The protective function stops 4WAS system temporarily when the input signal is not inputted to 4WAS main control unit (When battery-power dose not work temporarily).
- 4WAS front control unit and 4WAS main control unit perform two-way transmitting/receiving signals for optimal control of 4WAS system via 4WAS communication line.

DTC Logic

INFOID:000000001666389

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause	
C1900	CONTROL UNIT [ABNORMAL1]	An error is detected inside 4WAS main control unit.	4WAS main control unit error	F
C1901	CONTROL UNIT [ABNORMAL2]	An error is detected inside 4WAS main control unit.	4WAS main control unit error	STC
C1906	CONTROL UNIT [ABNORMAL5]	An error is detected inside 4WAS main control unit.	4WAS main control unit error	-
C1907	CONTROL UNIT [ABNORMAL4]	An error is detected inside 4WAS main control unit.	4WAS main control unit error	Н
C1927	CONTROL UNIT [ABNORMAL5]	An error is detected inside 4WAS main control unit.	4WAS main control unit error	
C1933	CONTROL UNIT	An error is detected inside 4WAS main control unit.	4WAS main control unit error	-

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC	K
With CONSULT-III	
 Turn the ignition switch from OFF to ON. Perform 4WAS main control unit self-diagnosis. 	I
Is DTC "C1900", "C1901", "C1906", "C1907", "C1927" or "C1933" detected?	L
YES >> Proceed to diagnosis procedure. Refer to <u>STC-87, "Diagnosis Procedure"</u> . NO >> INSPECTION END	M
Diagnosis Procedure)
1.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)	Ν
With CONSULT-III Perform 4WAS main control unit self-diagnosis.	
Is any DTC "C1900", "C1901", "C1906", "C1907", "C1927" or "C1933" detected?	0
YES >> Replace 4WAS main control unit. Refer to <u>STC-178. "Exploded View"</u> . NO >> GO TO 2.	Р
2. CHECK INFORMATION	
	•

With CONSULT-III

Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155.</u> <u>"Reference Value"</u>.

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.

C1900, C1901, C1906, C1907, C1927, C1933 4WAS MAIN CONTROL UNIT

< COMPONENT DIAGNOSIS >

NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

Special Repair Requirement

INFOID:000000001666391

[WITH 4WAS]

BEFORE REPLACING 4WAS MAIN CONTROL UNIT

- Record the self-diagnosis results (history).
 - CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

C1902, C1903, C1904, C1910, C1913 4WAS REAR MOTOR OUTPUT [WITH 4WAS] < COMPONENT DIAGNOSIS >

C1902, C1903, C1904, C1910, C1913 4WAS REAR MOTOR OUTPUT

Description

- 4WAS rear motor activates 4WAS rear actuator.
- В Maintain the toe-stiffness of rear wheels against the road external force because the irreversible sufficiency performance hypoid gear is used.

DTC Logic

INFOID:000000001666393 С

INFOID:000000001666392

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DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause	_
C1902	MOTOR OUTPUT [REV CURRENT]	4WAS rear motor current error is detected. (4WAS rear motor current output direction differs.)	4WAS rear motor error	E
C1903	MOTOR OUTPUT [NO CURRENT]	4WAS rear motor current error is detected. (Current is input to 4WAS main control unit if 4WAS main control unit output is "OFF".)	4WAS rear motor error	F
C1904	MOTOR OUTPUT [OVERCURRENT]	4WAS rear motor current error is detected. (4WAS rear motor output is overcurrent.)	4WAS rear motor error	
C1910	MOTOR OUTPUT [MOTOR LOCK]	4WAS rear motor inside error is detected. (4WAS rear motor does not move or the rear wheel an- gle sensor does not change if 4WAS main control unit output is 14A or more.)	4WAS rear motor error	- STO
C1913	MOTOR OUTPUT [ABNORML SIG]	4WAS rear motor current error is detected. (4WAS rear motor does not move or the rear wheel an- gle sensor output does not change when 4WAS main control unit output is 18A or more, and 4WAS main mo- tor output is low.)	4WAS rear motor error	

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

(P)With CONSULT-III	Κ
1. Perform "SELF DIAGNOSTIC MODE" item on "ACTIVE TEST" of 4WAS main control unit.	
CAUTION:	
Perform the active test while stopping the vehicle.2. Perform 4WAS main control unit self-diagnosis.	L
<u>Is DTC "C1902", "C1903", "C1904", "C1910" or "C1913" detected?</u>	
YES >> Proceed to diagnosis procedure. Refer to <u>STC-89, "Diagnosis Procedure"</u> . NO >> INSPECTION END	Μ
Diagnosis Procedure	Ν
1. CHECK 4WAS REAR MOTOR CIRCUIT	
 Turn the ignition switch OFF. Disconnect 4WAS main control unit harness connector. Disconnect 4WAS rear motor harness connector. Check the continuity between 4WAS main control unit harness connector and 4WAS rear motor harness. 	0

Check the continuity between 4WAS main control unit harness connector and 4WAS rear motor harness 4. Ρ connector.

4WAS main control unit		4WAS rear motor		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
B54	38	B36	1	Existed	
004	39	530	2	LAISICU	

C1902, C1903, C1904, C1910, C1913 4WAS REAR MOTOR OUTPUT

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the harnesses and connectors.

2.CHECK 4WAS REAR MOTOR

Check the continuity between 4WAS rear motor connector terminals.

	Continuity		
Connector	Connector Terminal		
B36	1 – 2	Existed	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace 4WAS rear actuator. Refer to STC-180, "Exploded View".

3. PERFORM ACTIVE TEST (4WAS MAIN CONTROL UNIT)

()With CONSULT-III

- T. Connect 4WAS main control unit harness connector.
- 2. Connect 4WAS rear motor harness connector.
- Perform "SELF DIAGNOSTIC MODE" item on "ACTIVE TEST" of 4WAS main control unit. CAUTION:

Perform the active test while vehicle is stopped.

 Check "MOTOR VOLTAGE", "MOTOR CURRENT" and "MTR CRNT OPE" while performing the active test.

Monitor item	Condition	Display value
MOTOR VOLTAGE	Ignition switch: ON	Battery voltage
MOTOR CURRENT	4WAS rear motor running 0 – 20	
MTR CRNT OPE	4WAS rear actuator neutral condition and vehicle straight-ahead position	Approx. –2 – 2 A
	4WAS rear motor running	Approx. –20 – 20 A

Is "MONITOR" the standard value?

YES >> GO TO 4.

NO >> Replace 4WAS rear actuator. Refer to <u>STC-180, "Exploded View"</u>.

4.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

Perform 4WAS main control unit self-diagnosis.

Is any DTC "C1902", "C1903", "C1904", "C1910" or "C1913" detected?

YES >> Replace 4WAS main control unit. Refer to STC-178, "Exploded View".

NO >> GO TO 5.

5.CHECK INFORMATION

With CONSULT-III

Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155,</u> <u>"Reference Value"</u>.

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.

NO >> Replace 4WAS main control unit. Refer to <u>STC-178. "Exploded View"</u>.

Component Inspection (4WAS Rear Motor)

INFOID:000000001666395

1.CHECK 4WAS REAR MOTOR

1. Turn the ignition switch OFF.

- 2. Disconnect 4WAS main control unit harness connector and 4WAS rear motor harness connector.
- 3. Check the continuity between 4WAS rear motor connector terminals.

C1902, C1903, C1904, C1910, C1913 4WAS REAR MOTOR OUTPUT < COMPONENT DIAGNOSIS > [WITH 4WAS]

А 4WAS rear motor Continuity Connector Terminal B36 1 - 2Existed В Is the inspection result normal? YES >> INSPECTION END NO >> Replace 4WAS rear actuator. Refer to STC-180, "Exploded View". С Special Repair Requirement INFOID:000000001666396 BEFORE REPLACING 4WAS MAIN CONTROL UNIT D Record the self-diagnosis results (history). **CAUTION:** • Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit Е after diagnosis.

• Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

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C1905, C1908, C1922, C1925, C1928 4WAS MAIN CONTROL UNIT < COMPONENT DIAGNOSIS > [WITH 4WAS]

C1905, C1908, C1922, C1925, C1928 4WAS MAIN CONTROL UNIT

Description

INFOID:000000001878370

- 4WAS rear actuator and the power steering solenoid valve is controlled by each sensor signal.
- The fail-safe functions stops the rear wheel angle function (the front wheel is the steering wheel cutting angle) when the electric components and the mechanical components are malfunctioning.
- The protective function stops 4WAS system temporarily when the input signal is not inputted to 4WAS main control unit (When battery-power dose not work temporarily).
- 4WAS front control unit and 4WAS main control unit perform two-way transmitting/receiving signals for optimal control of 4WAS system via 4WAS communication line.

DTC Logic

INFOID:000000001666398

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1905	CONTROL UNIT [ABNORMAL3]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1908	CONTROL UNIT [ABNORMAL7]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1922	CONTROL UNIT [ABNORMAL8]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1925	AD CONVERTER	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1928	CONTROL UNIT [ABNORMAL9]	An error is detected inside 4WAS main control unit.	4WAS main control unit error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- 1. Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS main control unit self-diagnosis.

Is any DTC "C1905", "C1908", "C1922", "C1925" or "C1928" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-92, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001666399

1.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

Perform 4WAS main control unit self-diagnosis.

Is any DTC "C1905", "C1908", "C1922", "C1925" or "C1928" detected?

YES >> Replace 4WAS main control unit. Refer to <u>STC-178</u>, "Exploded View".

NO >> GO TO 2.

2. CHECK INFORMATION

With CONSULT-III

Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155,</u> "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.

NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

C1905, C1908, C1922, C1925, C1928 4WAS MAIN CONTROL UNIT

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

Special Repair Requirement	INFOID:000000001666400	А
 BEFORE REPLACING 4WAS MAIN CONTROL UNIT Record the self-diagnosis results (history). CAUTION: Never erase the memory (history) of self-diagnosis results when replacing 4WAS magnetic 	in control unit	В
 after diagnosis. Erase the memory of the self-diagnosis results (record) after printing out or recordi ues of "DATA MONITOR". 	ng all the val-	С
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C1909 4WAS MAIN CONTROL UNIT

< COMPONENT DIAGNOSIS >

C1909 4WAS MAIN CONTROL UNIT

Description

INFOID:000000001878371

[WITH 4WAS]

- 4WAS rear actuator and the power steering solenoid valve is controlled by each sensor signal.
- The fail-safe functions stops the rear wheel angle function (the front wheel is the steering wheel cutting angle) when the electric components and the mechanical components are malfunctioning.
- The protective function stops 4WAS system temporarily when the input signal is not inputted to 4WAS main control unit (When battery-power dose not work temporarily).
- 4WAS front control unit and 4WAS main control unit perform two-way transmitting/receiving signals for optimal control of 4WAS system via 4WAS communication line.

DTC Logic

INFOID:000000001666402

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1909	CONTROL UNIT [ABNORMAL6]	An error is detected inside 4WAS main control unit.	4WAS main control unit

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS main control unit self-diagnosis.

Is DTC "C1909" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-94, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001666403

1.CHECK 4WAS MAIN CONTROL UNIT POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect 4WAS main control unit harness connector.
- 3. Check the voltage between 4WAS main control unit harness connector terminal and the ground.

4	WAS main control unit	Voltage (Approx.)	
Connector	Terminal	vollage (rippiox.)	
B54	27 – Ground	0 V	

4. Turn the ignition switch ON. CAUTION:

Never start the engine.

5. Check the voltage between 4WAS main control unit harness connector terminal and the ground.

4	VAS main control unit	Voltage (Approx.)	
Connector	Terminal	voltage (Applox.)	
B54	27 – Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 2.

- NG >> Check the following items. Repair or replace the malfunctioning parts.
 - 10A fuse (#45) open
 - Short among 10Å fuse (#45) connector, 4WAS main control unit harness connector No. 27 terminal and the ground

C1909 4WAS MAIN CONTROL UNIT

< COMPON	IENT DIAGNOSIS >		[WITH 4WAS]
	 Open between the ignition switch a nal Ignition switch 	and 4WAS main control unit harness connec	tor No. 27 termi-
-	WAS MAIN CONTROL UNIT GROU	IND	
		ol unit harness connector and the ground.	
	4WAS main control unit	Continuity	
Connector	Terminal		
B54	34 – Ground	Existed	
	ction result normal?		
	GO TO 3. Repair or replace the harnesses and	connectors.	
•	M SELF-DIAGNOSIS (4WAS MAIN		
		,	
1. Connec	t 4WAS main control unit harness co		
	4WAS main control unit self-diagnos	sis.	
	0 <u>09" detected?</u> Replace 4WAS main control unit. Re	for to STC 178 "Exploded View"	
	GO TO 4.	ser to <u>STC-178, Exploded New</u> .	
4.CHECKI	NFORMATION		
With CON Check the "I "Reference"	DATA MONITOR" value of each DTC	detected with the self-diagnosis function. R	efer to <u>STC-155,</u>
	the standard value?		
	Check each harness connector pin te Replace 4WAS main control unit. Re		
Special R	epair Requirement		INFOID:000000001666404
-	EPLACING 4WAS MAIN CONTR	ROL UNIT	
 Record the CAUTION 	e self-diagnosis results (history).		
 Never er after dia 	rase the memory (history) of self-c Ignosis.	liagnosis results when replacing 4WAS m	
	ne memory of the self-diagnosis re DATA MONITOR".	esults (record) after printing out or record	ding all the val-

C1911, C1912 4WAS REAR MOTOR POWER SUPPLY

< COMPONENT DIAGNOSIS >

C1911, C1912 4WAS REAR MOTOR POWER SUPPLY

Description

• The power supply for 4WAS rear motor.

DTC Logic

INFOID:000000001666406

INFOID:000000001666405

[WITH 4WAS]

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1911	MOTOR VOLTAGE [LOW VOLTAGE]	4WAS rear motor voltage error is detected. (4WAS rear motor voltage is low.)	4WAS rear motor power supply error
C1912	MOTOR VOLTAGE [BAD OBSTRCT]	4WAS rear motor voltage error is detected. (Voltage is applied to 4WAS main motor when 4WAS main control unit output is "OFF".)	4WAS rear motor power supply error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

1. Turn the ignition switch from OFF to ON. CAUTION:

Stop the vehicle. Wait 15 minutes or more.

2. Perform 4WAS main control unit self-diagnosis.

Is DTC "C1911" or "C1912" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-96, "Diagnosis Procedure"</u>.
- NO >> INSPECTION ĔND

Diagnosis Procedure

1.CHECK 4WAS MAIN CONTROL UNIT POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect 4WAS main control unit harness connector.
- 3. Check the voltage between 4WAS main control unit harness connectors and the ground.

4\	WAS main control unit	Voltage (Approx.)	
Connector	Terminal	vollage (Applox.)	
B54	27 – Ground	0 V	

4. Turn the ignition switch ON. CAUTION:

Never start the engine.

5. Check the voltage between 4WAS main control unit harness connectors and the ground.

4	NAS main control unit	Voltage (Approx.)	
Connector	Terminal	vollage (Applox.)	
B54	27 – Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 2. NO >> Check th

- >> Check the following items. Repair or replace the malfunctioning parts.
 - 10A fuse (#45) open
 - Short among 10A fuse (#45) connector, 4WAS main control unit harness connector No. 27 terminal and the ground
 - Open between the ignition switch and 4WAS main control unit harness connector No. 27 terminal

STC-96

INFOID:000000001666407

	 Ignition sw 	ritch			
2.CHECK	4WAS REAR	MOTOR PC	WER SUP	PLY CIRCUI	Г (1)
2. Remove	e ignition swit e 4WAS rear he continuity	motor relay.	/AS rear mo	otor relay hai	ness connector terminal and the ground.
		motor relay			
Connector	407.0104	Terminal		Continuity	
		1 – Ground		Existed	
B53		2 – Ground		Not existed	
	he continuity ness connec		/AS rear mo	otor relay har	ness connector terminal and 4WAS main control
4WAS rear	motor relay	4WAS main	control unit		
Connector	Terminal	Connector	Terminal	Continuity	
B53	2	B54	25	Existed	
		MOTOR PC			
	oltage betwe	en 4WAS rea	ar motor rel		onnector terminal and the ground.
	WAS rear moto	r relay		ay harness c	
4 Connector	WAS rear moto	r relay erminal	Voltag	ay harness c le (Approx.)	
4 Connector B53 s the inspec	WAS rear moto Te 3 – ction result n	r relay erminal Ground	Voltag	ay harness c	
4 Connector B53 s the inspec YES >> NO >>	WAS rear moto Te 3 – ction result n GO TO 4. Check the • 20A fuse (• Short amo nal and the • Open betw	r relay erminal Ground ormal? following iter #37) open ng 20A fuse e ground veen the batter MOTOR PC	Voltag Batte ms. Repair o (#37) conne ery and 4W.	ay harness of le (Approx.) ery voltage for replace th ector, 4WAS AS rear moto	onnector terminal and the ground. e malfunctioning parts. rear motor relay harness connector No. 3 termi- or relay harness connector No. 3 terminal
4 Connector B53 s the inspec YES >> NO >> NO >> 4.CHECK 4	WAS rear moto Te 3 – ction result n GO TO 4. Check the • 20A fuse (i • 20A fuse (i • Short amo nal and the • Open betw 4WAS REAR • the noise si continuity bet	r relay erminal Ground ormal? following iter #37) open ng 20A fuse e ground veen the batter MOTOR PC uppressor. ween the no	Voltag Batte ms. Repair o (#37) conne ery and 4W. WER SUPI	ay harness of le (Approx.) ery voltage or replace th ector, 4WAS AS rear moto PLY CIRCUI sor harness	onnector terminal and the ground. e malfunctioning parts. rear motor relay harness connector No. 3 termi- or relay harness connector No. 3 terminal
4 Connector B53 s the inspec YES >> NO >> NO >>	WAS rear moto Te 3 – ction result n GO TO 4. Check the • 20A fuse (i • 20A fuse (i • Short amo nal and the • Open betw 4WAS REAR • the noise si continuity bet	r relay erminal Ground ormal? following iter #37) open ng 20A fuse e ground veen the batte MOTOR PC uppressor.	Voltag Batte ms. Repair o (#37) conne ery and 4W. WER SUPI	ay harness of le (Approx.) ery voltage for replace th ector, 4WAS AS rear moto PLY CIRCUI	onnector terminal and the ground. e malfunctioning parts. rear motor relay harness connector No. 3 termi- or relay harness connector No. 3 terminal Γ (3)
4 Connector B53 S the inspect YES >> NO >> NO >> 4.CHECK 4 Check connector	WAS rear moto Te 3 – ction result n GO TO 4. Check the • 20A fuse (i • 20A fuse (i • Short amo nal and the • Open betw 4WAS REAR • the noise si continuity bet	r relay erminal Ground ormal? following iter #37) open ng 20A fuse e ground /een the batte MOTOR PC uppressor. ween the no	Voltag Batte ms. Repair o (#37) conne ery and 4W. WER SUPI	ay harness of e (Approx.) ery voltage or replace th ector, 4WAS AS rear moto PLY CIRCUI sor harness Continuity	onnector terminal and the ground. e malfunctioning parts. rear motor relay harness connector No. 3 termi- or relay harness connector No. 3 terminal Γ (3)
4 Connector B53 s the inspec YES >> NO >> NO >> 4.CHECK 4 . Remove	WAS rear moto Te 3 – ction result n GO TO 4. Check the • 20A fuse (i • 20A fuse (i • Short amo nal and the • Open betw 4WAS REAR • the noise si continuity bet	r relay erminal Ground ormal? following iter #37) open ng 20A fuse e ground veen the batte MOTOR PC uppressor. ween the noi uppressor Terminal	Voltag Batte ms. Repair o (#37) conne ery and 4W. WER SUPI	ay harness of le (Approx.) ery voltage or replace th ector, 4WAS AS rear moto PLY CIRCUI sor harness	onnector terminal and the ground. e malfunctioning parts. rear motor relay harness connector No. 3 termi- or relay harness connector No. 3 terminal Γ (3)
4 Connector B53 s the inspec YES >> NO >> A.CHECK 4 Check c Connector B51	WAS rear moto Te 3 – ction result n GO TO 4. Check the • 20A fuse (i • 20A fuse (i • Short amo nal and the • Open betw 4WAS REAR • the noise si continuity bet	r relay erminal Ground ormal? following iter #37) open ng 20A fuse e ground veen the batte MOTOR PC uppressor. ween the not uppressor Terminal 3 – Ground	Voltag Batte ms. Repair o (#37) conne ery and 4W. WER SUPI	ay harness of e (Approx.) ery voltage or replace th ector, 4WAS AS rear moto PLY CIRCUI sor harness Continuity	onnector terminal and the ground. e malfunctioning parts. rear motor relay harness connector No. 3 termi- or relay harness connector No. 3 terminal Γ (3)
4 Connector B53 s the inspec YES >> NO >> NO >> 4.CHECK 4 1. Remove 2. Check c	WAS rear moto Te 3 – ction result n GO TO 4. Check the • 20A fuse (i • 20A fuse (i • Short amo nal and the • Open betw 4WAS REAR • the noise si continuity bet	r relay erminal Ground ormal? following iter #37) open ng 20A fuse e ground veen the batte MOTOR PC uppressor. ween the noi uppressor Terminal 3 – Ground 5 – Ground	Voltag Batte ms. Repair o (#37) conne ery and 4W. WER SUPI	ay harness of e (Approx.) ery voltage or replace th ector, 4WAS AS rear moto PLY CIRCUI sor harness Continuity Not existed	onnector terminal and the ground. e malfunctioning parts. rear motor relay harness connector No. 3 termi- or relay harness connector No. 3 terminal Γ (3)
4 Connector B53 s the inspec YES >> NO >> A.CHECK 4 1. Remove 2. Check c Connector B51 B52 3. Check t	WAS rear moto Te 3 – Ction result no GO TO 4. Check the • 20A fuse (i • Short amo nal and the • Open betw 4WAS REAR • the noise su Sontinuity bet Noise su he continuity	r relay erminal Ground ormal? following iter #37) open ng 20A fuse e ground //een the batter MOTOR PC uppressor. ween the noi ppressor Terminal 3 – Ground 5 – Ground 1 – Ground 2 – Ground	Voltage Batte ms. Repair of (#37) conno ery and 4W. WER SUPI ise suppres ise suppres e noise su	ay harness of e (Approx.) ery voltage or replace th ector, 4WAS AS rear moto PLY CIRCUI sor harness Continuity Not existed Not existed Existed	onnector terminal and the ground. e malfunctioning parts. rear motor relay harness connector No. 3 termi- or relay harness connector No. 3 terminal Γ (3)

Noise su	ppressor	4WAS rear motor relay Connector Terminal		Continuity	
Connector	Terminal			Continuity	
B52	1	B53	5	Existed	

C1911, C1912 4WAS REAR MOTOR POWER SUPPLY

< COMPONENT DIAGNOSIS >

4. Check the continuity between the noise suppressor harness connector terminal and 4WAS main control unit harness connector terminal.

Noise su	ippressor	4WAS main control unit		Continuity
Connector	Terminal	Connector Terminal		Continuity
B51	3	B54	37	Existed
DUT	1 <u>5</u> B54		40	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace the harnesses and connectors.

5.CHECK 4WAS REAR MOTOR POWER SUPPLY CIRCUIT (4)

1. Connect 4WAS main control unit harness connector.

2. Turn the ignition switch ON. CAUTION:

Never start the engine.

3. Check the voltage between 4WAS main control unit harness connectors and the ground.

4	WAS main control unit	Voltage (Approx.)	
Connector	Terminal	vollage (Applox.)	
B54	25 – Ground	Battery voltage	

4. Turn the ignition switch OFF.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

6.CHECK 4WAS REAR MOTOR RELAY

- 1. Apply 12 V to 4WAS rear motor relay connector No. 1 terminal and No. 2 terminal. CAUTION:
 - Never make the terminals short.

• Connect the fuse between the terminals when applying the voltage.

2. Check the continuity between 4WAS rear motor relay connector terminals.

	Continuity		
Connector	Terminal	Continuity	
P52		Apply the voltage between No. 1 terminal and No. 2 terminal.	Existed
B53 3 – 5		Do not apply the voltage be- tween No. 1 terminal and No. 2 terminal.	Not existed

3. Check the resistance between 4WAS rear motor relay connector terminals.

4	WAS rear motor relay	Resistance (Approx.)	
Connector	Terminal		
B53	1 – 2	50 Ω	

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace 4WAS rear motor relay.

I.CHECK NOISE SUPPRESSOR

Check continuity between the noise suppressor connector terminals.

[WITH 4WAS]

C1911, C1912 4WAS REAR MOTOR POWER SUPPLY

< COMPONENT DIAGNOSIS >

	Noise si	Ippressor			А
Connector	Terminal	Connector	Terminal	- Continuity	
B51	3	B52	1	Existed	_
B51	3	B51	5	Not existed	В
B51	3	B52	2	Not existed	
B51	5	B52	2	Existed	С
B51	5	B52	1	Not existed	
Is the inspec					
YES >> (GO TO 8.	noise suppre	essor.		D
8. CHECK 4	WAS REAR	MOTOR PC	WER SUP	PLY	Е
 Install th Turn the CAUTIO Never st 	tart the eng	pressor. tch ON. jine.	S main con	ntrol unit harness connectors and the ground.	F
	VAS main cont		Voltag	ge (Approx.)	
Connector		erminal	_		Н
B54 Is the inspec		- Ground	Batte	tery voltage	
9.PERFORM BWith CON Perform 4WA Is DTC "C19 YES >> F NO >> C	M SELF-DIA ISULT-III AS main cor 11" or "C191 Replace 4W GO TO 10.	AGNOSIS (4) htrol unit self- 12" detected? AS main con	WAS MAIN diagnosis.	efer to <u>STC-178, "Exploded View"</u> . CONTROL UNIT) efer to <u>STC-178, "Exploded View"</u> .	K
" <u>Reference \</u> Is each data YES >> (ISULT-III DATA MONI ⁻ <u>/alue"</u> . the standard Check each	TOR" value o d value? harness con	nector pin t	C detected with the self-diagnosis function. Refer to <u>STC-155</u> , terminal for disconnection.	N
-	•		_	efer to <u>STC-178, "Exploded View"</u> . Motor Relay)	
1. снеск 4	•	,		······································	С
 Turn the Remove Apply 12 CAUTIO Never Conne 	ignition swi 4WAS rear 2 V to 4WAS N: make the to ect the fuse	tch OFF. motor relay rear motor r erminals sho between the	connector. elay connec ort. e terminals	ector No. 1 terminal and No. 2 terminal. s when applying the voltage. otor relay connector terminals.	F

< COMPONENT DIAGNOSIS >

	Continuity		
Connector	Terminal	Continuity	
B53		Apply the voltage between No. 1 terminal and No. 2 terminal.	Existed
533	3 – 5	Do not apply the voltage be- tween No. 1 terminal and No. 2 terminal.	Not existed

5. Check the resistance between 4WAS rear motor relay connector terminals.

4	WAS rear motor relay	Resistance (Approx.)
Connector	Terminal	
B53	1 – 2	50 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace 4WAS rear motor relay.

Component Inspection (Noise Suppressor)

1.NOISE SUPPRESSOR INSPECTION

- 1. Turn the ignition switch OFF.
- 2. Remove the noise suppressor.
- 3. Check continuity between the noise suppressor connector terminals.

	Continuity					
Connector	Connector Terminal Connector Terminal					
B51	3	B52	1	Existed		
B51	3	B51	5	Not existed		
B51	3	B52	2	Not existed		
B51	5	B52	2	Existed		
B51	5	B52	1	Not existed		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace the noise suppressor.

Special Repair Requirement

INFOID:000000001666410

BEFORE REPLACING 4WAS MAIN CONTROL UNIT

- Record the self-diagnosis results (history). CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

Revision: 2007 June

INFOID:000000001666409

C1914 REAR WHEEL STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

C1914 REAR WHEEL STEERING ANGLE SENSOR

Description

- It detects the steering angle condition of rear wheel.
- 2 systems (main and sub sensor) are equipped.

DTC Logic

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1914	RR ST ANGLE SENSOR [ABNORML VOL]	The rear wheel angle sensor power supply error tected.	is de- sor power supply error
TC CONFI	RMATION PROCEDURE		
.RECHECK	DTC		
	gnition switch from OFF to WAS main control unit self		
	roceed to diagnosis proced	ure. Refer to <u>STC-101, "Diagnosis Proce</u>	<u>dure"</u> .
Diagnosis l	Procedure		INFOID:000000001666413
	AR WHEEL STEERING A	NGLE SENSOR POWER SUPPLY	
. Turn the i	gnition switch OFF.	ain control unit harness connector termin	al and the ground.
4W/	AS main control unit	Voltage (Approx.)	
Connector	Terminal	volage (Applox.)	
B54	5 – Ground	0 V	
CAUTION Never sta	art the engine.	ain control unit harness connector termin	al and the ground.
4W/	AS main control unit		
Connector	Terminal	Value (Approx.)	
B54	5 – Ground	5 V	
YES >> G NO >> R	•	unit. Refer to <u>STC-178, "Exploded View"</u> .	
🖊 CHECK RE	AR WHEEL STEERING A		

2.CHECK REAR WHEEL STEERING ANGLE SENSOR

1. Turn the ignition switch OFF.

2. Disconnect the rear wheel steering angle sensor harness connector.

3. Check the resistance between the rear wheel steering angle sensor connector terminals.

Revision: 2007 June

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[WITH 4WAS]

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< COMPONENT DIAGNOSIS >

Rear wheel steering angle sensor		Resistance (Approx.)	
Connector	Terminal		
	1 – 3	1 kΩ	
B35	1 – 2	1.2 – 1.5 kΩ	
	1 – 4	1.2 – 1.5 kΩ	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace 4WAS rear actuator. Refer to <u>STC-180, "Exploded View"</u>.

 ${
m 3.}$ CHECK REAR WHEEL STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect 4WAS main control unit harness connector.

2. Check the continuity between 4WAS main control unit harness connector terminal and the rear wheel steering angle sensor harness connector terminal.

4WAS main control unit		Rear wheel steering angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
B54	5	B35	1	Existed
B54	5	B35	3	Not existed
B54	15	B35	3	Existed
B54	15	B35	1	Not existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the harnesses and connectors.

4.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

- 1. Connect 4WAS main control unit harness connector.
- 2. Connect the rear wheel steering angle sensor harness connector.
- 3. Perform 4WAS main control unit self-diagnosis.

Is DTC "C1914" detected?

YES >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

NO >> GO TO 5.

5. CHECK INFORMATION

With CONSULT-III

Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155.</u> "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.

NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

Component Inspection

INFOID:000000001666414

1.CHECK REAR WHEEL STEERING ANGLE SENSOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect rear wheel steering angle sensor harness connector.
- 3. Check the resistance between rear wheel steering angle sensor connector terminals.

C1914 REAR WHEEL STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

Rear wheel	steering angle sensor			А
Connector	Terminal	Resistance (Approx.)		
	1 – 3	1 kΩ		В
B35	1 – 2	1.2 – 1.5 kΩ		
	1 – 4	1.2 – 1.5 kΩ		
Is the inspection	result normal?			С
NO >> Rep	PECTION END blace 4WAS rear actuat air Requirement	or. Refer to <u>STC-180,</u>	"Exploded View".	D
-	LACING 4WAS MAIN If-diagnosis results (his			E
after diagno • Erase the n	osis.	, -	sults when replacing 4WAS main control unit rd) after printing out or recording all the val-	F

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C1915, C1916 REAR WHEEL STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

C1915, C1916 REAR WHEEL STEERING ANGLE SENSOR

Description

- It detects the steering angle condition of rear wheel.
- 2 systems (main and sub sensor) are equipped.

DTC Logic

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1915	RR ST ANGLE SENSOR [MAIN SIGNAL]	The rear wheel angle sensor signal (main) error is detected.	Rear wheel steering sen- sor output voltage error
C1916	RR ST ANGLE SENSOR [SUB SIGNAL]	If the rear wheel angle sensor signal (sub) error is detected.	Rear wheel steering sen- sor output voltage error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS main control unit self-diagnosis.

Is DTC "C1915" or "C1916" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-104, "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

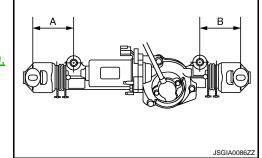
Diagnosis Procedure

1.CHECK 4WAS REAR ACTUATOR

- 1. Turn the ignition switch OFF.
- Measure "A" and "B" of 4WAS rear actuator as shown in the figure.

Is the differential of "A" and "B" 5.8 mm (0.228 in) or less?

- YES >> GO TO 2.
- NO >> Replace 4WAS rear actuator. Refer to <u>STC-180</u>, <u>"Exploded View"</u>.



2.CHECK REAR WHEEL STEERING ANGLE SENSOR (1)

With CONSULT-III

- 1. Start engine. CAUTION: Check condition with the vehicle stopped.
- 2. Check DATA MONITOR "RR ST ANG-MAI" and "RR ST ANG-SUB" value of 4WAS main control unit.

Monitored item	Condition	Display value
RR ST ANG-MAI	Straight-ahead	Approx. 2.4 V
RR ST ANG-SUB	Straight-ahead	Approx. 2.6 V

Is the inspection result normal?

YES >> GO TO 3.

STC-104

INFOID:000000001666416

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C1915, C1916 REAR WHEEL STEERING ANGLE SENSOR [WITH 4WAS] < COMPONENT DIAGNOSIS > NO >> Replace 4WAS rear actuator. Refer to STC-180, "Exploded View". ${f 3.}$ CHECK REAR WHEEL STEERING ANGLE SENSOR (2) А Check the voltage between 4WAS main control unit harness connector terminal and ground. В 4WAS main control unit Voltage (Approx.) Terminal Connector 4 - Ground 2.4 V B54 7 – Ground 2.6 V Is the differential between terminal voltage No. 4 and No.7 approximately 1 V or more? D >> Replace 4WAS main control unit. Refer to STC-178, "Exploded View". YES NO >> GO TO 4. **4.**CHECK REAR WHEEL STEERING ANGLE SENSOR (3) Е 1. Turn the ignition switch OFF. Disconnect rear wheel steering angle sensor harness connector. 2. Check resistance between rear wheel steering angle sensor connector terminals. 3. F Rear wheel steering angle sensor Resistance (Approx.) STC Connector Terminal 1 – 3 $1 \ k\Omega$ B35 1 - 2 $1.2 - 1.5 \text{ k}\Omega$ Н 1 - 4 $1.2 - 1.5 \text{ k}\Omega$

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace 4WAS rear actuator. Refer to STC-180, "Exploded View".

5.CHECK REAR WHEEL STEERING ANGLE SENSOR GROUND CIRCUIT

1. Disconnect 4WAS main control unit harness connector.

 Check for continuity between 4WAS main control unit harness connector terminal and rear wheel steering angle sensor harness connector terminal.

Continuity	Rear wheel steering angle sensor		4WAS main control unit	
	Terminal	Connector	Terminal	Connector
Not existed	1, 2, 3	B35	4	B54
Existed	4	B35	4	B54
Not existed	1, 3, 4	B35	7	B54
Existed	2	B35	7	B54
Existed	1	B35	5	B54
Not existed	2, 3, 4	B35	5	B54
Not existed	1, 2, 4	B35	15	B54
Existed	3	B35	15	B54
		10		1 41 1

With CONSULT-III

1. Connect 4WAS main control unit harness connector.

2. Connect rear wheel steering angle sensor harness connector.

3. Perform 4WAS main control unit self-diagnosis.

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C1915, C1916 REAR WHEEL STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

Is DTC "C1915" or "C1916" detected?

YES >> Replace 4WAS main control unit. Refer to STC-178, "Exploded View".

NO >> GO TO 7.

7. CHECK INFORMATION

With CONSULT-III

Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155.</u> "Reference Value".

Is each data standard?

- YES >> Check pin terminal and connection of each harness connector for non-standard conditions.
- NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

Component Inspection

INFOID:000000001666419

[WITH 4WAS]

1.CHECK REAR WHEEL STEERING ANGLE SENSOR

- 1. Turn the ignition switch OFF.
- 2. Disconnect rear wheel steering angle sensor harness connector.
- 3. Check the resistance between rear wheel steering angle sensor connector terminals.

Rear w	heel steering angle sensor	Resistance (Approx.)	
Connector Terminal		Resistance (Approx.)	
	1 – 3	1 kΩ	
B35	1 – 2	1.2 – 1.5 kΩ	
	1 – 4	1.2 – 1.5 kΩ	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace 4WAS rear actuator. Refer to <u>STC-180, "Exploded View"</u>.

Special Repair Requirement

INFOID:000000001666420

BEFORE REPLACING 4WAS MAIN CONTROL UNIT

• Record the self-diagnosis results (history). CAUTION:

 Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis.

• Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

C1917, C1918 REAR WHEEL STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

C1917, C1918 REAR WHEEL STEERING ANGLE SENSOR

Description

- It detects the steering angle condition of rear wheel.
- 2 systems (main and sub sensor) are equipped.

DTC Logic

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause	D
 C1917	RR ST ANGLE SENSOR [OFFSET SIG1]	The rear wheel angle sensor signal (main and sub) er- ror is detected. (The output signal value differs temporarily between main and sub.)	Rear wheel steering sen- sor (main and sub) output signal value error signal	Е
C1918	RR ST ANGLE SENSOR [OFFSET SIG2]	The rear wheel angle sensor signal (main and sub) er- ror is detected. (The output signal value differs between main and sub.)	Rear wheel steering sen- sor (main and sub) output signal error	F

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1 Start the engine. **CAUTION:** Stop the vehicle. 2. Perform the active test. Perform 4WAS main control unit self-diagnosis. 3. Is DTC "C1917" or "C1918" detected? YES >> Proceed to diagnosis procedure. Refer to STC-107, "Diagnosis Procedure". >> INSPECTION END NO Κ Diagnosis Procedure INFOID:000000001666423 **1.**CHECK REAR WHEEL STEERING ANGLE SENSOR (1) With CONSULT-III Start engine. 1 CAUTION: Μ Check condition with the vehicle stopped. Check "RR ST ANG-MAI" and "RR ST ANG-SUB" item on "DATA MONITOR" of 4WAS main control unit. Ν Monitored item Condition Display value **RR ST ANG-MAI** Straight-ahead Approx. 2.4 V **RR ST ANG-SUB** Straight-ahead Approx. 2.6 V Is the inspection result normal? YES >> GO TO 2. NO >> Replace 4WAS rear actuator. Refer to STC-180, "Exploded View". Ρ 2.CHECK REAR WHEEL STEERING ANGLE SENSOR (2)

Check the voltage between 4WAS main control unit harness connector terminal and ground.

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[WITH 4WAS]

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C1917, C1918 REAR WHEEL STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

	4WAS main control unit			
Connector Terminal		Voltage (Approx.)		
B54	4 – Ground	2.4 V		
604	7 – Ground	2.6 V		

Is the differential between terminal voltage No. 4 and No.7 approximately 1 V or more?

YES >> Replace 4WAS main control unit. Refer to STC-178, "Exploded View".

NO >> GO TO 3.

3.CHECK REAR WHEEL STEERING ANGLE SENSOR (3)

- 1. Turn the ignition switch OFF.
- 2. Disconnect rear wheel steering angle sensor harness connector.
- 3. Check resistance between rear wheel steering angle sensor connector terminals.

R	ear wheel steering angle sensor	Resistance (Approx.)
Connector	Terminal	
	1 – 3	1 kΩ
B35	1 – 2	1.2 – 1.5 kΩ
	1 – 4	1.2 – 1.5 kΩ

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace 4WAS rear actuator. Refer to <u>STC-180, "Exploded View"</u>.

4.CHECK REAR WHEEL STEERING ANGLE SENSOR GROUND CIRCUIT

1. Disconnect 4WAS main control unit harness connector.

2. Check for continuity between 4WAS main control unit harness connector terminal and rear wheel steering angle sensor harness connector terminal.

4WAS main control unit		Rear wheel steering angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
B54	4	B35	1, 2, 3	Not existed
B54	4	B35	4	Existed
B54	7	B35	1, 3, 4	Not existed
B54	7	B35	2	Existed
B54	5	B35	1	Existed
B54	5	B35	2, 3, 4	Not existed
B54	15	B35	1, 2, 4	Not existed
B54	15	B35	3	Existed
1 4 1		10		

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace each harness and connector.

5.RERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

- 1. Connect 4WAS main control unit harness connector.
- 2. Connect rear wheel steering angle sensor harness connector.
- 3. Perform 4WAS main control unit self-diagnosis.

Is DTC "C1917" or "C1918" detected?

YES >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

NO >> GO TO 6.

C1917, C1918 REAR WHEEL STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

6.CHECK INFORMATION А With CONSULT-III Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to STC-155. "Reference Value". В Is each data standard? YES >> Check pin terminal and connection of each harness connector for non-standard conditions. NO >> Replace 4WAS main control unit. Refer to STC-178, "Exploded View". Component Inspection INFOID:000000001666424 1.CHECK REAR WHEEL STEERING ANGLE SENSOR D 1. Turn the ignition switch OFF. Disconnect rear wheel steering angle sensor harness connector. 2. Е Check the resistance between rear wheel steering angle sensor connector terminals. 3. Rear wheel steering angle sensor Resistance (Approx.) F Connector Terminal 1 – 3 1 kΩ $1.2 - 1.5 \text{ k}\Omega$ B35 1 – 2 STC 1 - 4 $1.2 - 1.5 \ k\Omega$ Is the inspection result normal? Н >> INSPECTION END YES >> Replace 4WAS rear actuator. Refer to STC-180, "Exploded View". NO Special Repair Requirement INFOID:000000001666425 BEFORE REPLACING 4WAS MAIN CONTROL UNIT Record the self-diagnosis results (history). CAUTION: Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis. • Erase the memory of the self-diagnosis results (record) after printing out or recording all the val-Κ ues of "DATA MONITOR". L Μ Ν Ρ

C1919 VEHICLE SPEED SIGNAL

Description

• The vehicle speed signal is transmitted from ABS actuator and electric unit (control unit) to 4WAS main control unit via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1919	VEHICLE SPEED SEN [NO SIGNAL]	Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) via CAN communication. (Improper signal inputs while driving.)	Vehicle speed signal error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- 1. Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS main control unit self-diagnosis.

Is DTC "C1919" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-110, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001666428

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

With CONSULT-III

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

Is any error system detected?

YES >> Check the error system.

NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

Perform 4WAS main control unit self-diagnosis.

Is DTC "U1000" or "U1010" detected?

YES >> Check the error system.

NO >> GO TO 3.

3. PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

Perform 4WAS main control unit self-diagnosis.

Is DTC "C1919" detected?

YES >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

NO >> GO TO 4.

4.INFORMATION CHECK

With CONSULT-III

Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155.</u> <u>"Reference Value"</u>.

Is each data the standard value?

STC-110

INEQID:000000001666427

INFOID:000000001666426

C1919 VEHICLE SPEED SIGNAL

CI919 VEHICLE SPEED SIGNAL	
< COMPONENT DIAGNOSIS > [WITH	H 4WAS]
YES >> Check that there is no malfunction in each harness connector pin terminal or disconnect NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u> .	tion. A
Special Repair Requirement	:000000001666429
 BEFORE REPLACING 4WAS MAIN CONTROL UNIT Record the self-diagnosis results (history). 	В
CAUTION: • Never erase the memory (history) of self-diagnosis results when replacing 4WAS main co	ntrol unit C
after diagnosis. Erase the memory of the self-diagnosis results (record) after printing out or recording all 	ll the val-
ues of "DATA MONITOR".	D
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C1920 STEERING ANGLE SEN

Description

Steering angle sensor signal is transmitted from steering angle sensor to 4WAS main control unit via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1920	STEERING ANGLE SEN [NO SIGNAL]	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN com- munication. (No transmission from the steering angle sensor)	Steering angle sensor in- put signal error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- 1. Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS main control unit self-diagnosis.

Is DTC "C1920" detected?

- YES >> Proceed to diagnosis procedure. Refer to STC-112, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000001666432

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

With CONSULT-III

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

Is any error system detected?

YES >> Check the error system.

NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

Perform 4WAS main control unit self-diagnosis.

Is DTC "U1000" or "U1010" detected?

YES >> Check the error system.

NO >> GO TO 3.

3. PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

Perform 4WAS main control unit self-diagnosis.

Is DTC "C1920" detected?

YES >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

NO >> GO TO 4.

4.INFORMATION CHECK

With CONSULT-III

Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155.</u> <u>"Reference Value"</u>.

Is each data the standard value?

INFOID:000000001666430

INEOID-000000001666431

C1920 STEERING ANGLE SEN

C1920 STEERING ANGLE SEN	
< COMPONENT DIAGNOSIS >	[WITH 4WAS]
YES >> Check that there is no malfunction in each harness connector pin termi NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u> .	nal or disconnection.
Special Repair Requirement	INFOID:000000001666433
 BEFORE REPLACING 4WAS MAIN CONTROL UNIT Record the self-diagnosis results (history). CAUTION: Never erase the memory (history) of self-diagnosis results when replacing after diagnosis. Erase the memory of the self-diagnosis results (record) after printing out ues of "DATA MONITOR". 	
AFTER REPLACING STEERING ANGLE SENSOR	
1. PERFORM ACTIVE TEST (LOCK OPERATION)	
 With CONSULT-III Stop vehicle with front wheels in the straight-ahead position. Turn the ignition switch ON. CAUTION: Never start engine. Select "LOCK OPERATION" item on "ACTIVE" of 4WAS front control unit. 	
 Perform "RELEASE" of "ACTIVE TEST". CAUTION: Turn steering wheel 90°, and then check that front tire does not move. Never turn steering wheel 1 turn or more while performing "RELEASE". Place steering wheel in neutral position. Perform "LOCK" item on "ACTIVE TEST" of 4WAS front control unit. Steer 30° leftward slowly. Steer 30° rightward and return the steering wheel to t Complete active test of 4WAS front control unit. 	he straight-ahead position.
>> GO TO 2. 2.STEERING ANGLE SENSOR NEUTRAL POSITION ADJUSTMENT	
 With CONSULT-III Adjust steering angle sensor neutral position. Refer to <u>BRC-8, "ADJUSTMEN</u> <u>SENSOR NEUTRAL POSITION : Special Repair Requirement"</u>. Turn the ignition switch OFF. 	T OF STEERING ANGLE
>> GO TO 3.	
3. RETURN TO 4WAS FRONT ACTUATOR INITIAL POSITION	
 Start engine. CAUTION: Check condition with the vehicle stopped. Turn steering wheel to the left by 90° slowly, and then turn to the right by 90°. 	
 Again, turn steering wheel to the left by 90° slowly, and then turn to the right by ahead. 	90° so that it faces straight
 anead. Stop vehicle with front wheels in the straight-ahead position after driving vehicl starting) 	e for a short time. (Engine
>> GO TO 4.	
4. CHECK 4WAS FRONT ACTUATOR	

CAUTION:

Never touch steering wheel while performing.

4WAS STR ANG : -3.5 - 3.5deg

2. Turn the ignition switch OFF.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 1.

5.PERFORM ACTIVE TEST (SLOW MODE)

With CONSULT-III

Start engine.

1.

Check condition with the vehicle stopped.

- 2. Select "SLOW MODE" item on "ACTIVE TEST" of 4WAS front control unit.
- 3. Perform "MODE START" of "ACTIVE TEST".
- 4. Turn steering wheel to the left slowly until it stops.
- 5. Turn steering wheel to the right slowly until it stops.

Does "OK" display on both the left and right sides on "SLOW MODE" items of the monitor?

YES >> GO TO 6.

NO >> Refer to <u>STC-30</u>, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special <u>Repair Requirement (Pattern 4)"</u>.

6.PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

With CONSULT-III

Perform 4WAS front control unit self-diagnosis.

Is malfunction detected?

YES >> Check malfunctioning circuit.

NO >> GO TO 7.

7.ERASE ERROR RECORD

With CONSULT-III

Erase memories of self-diagnosis results for 4WAS front control unit and 4WAS main control unit.

>> END

C1921 ENGINE SPEED SIGNAL

< COMPONENT DIAGNOSIS >

C1921 ENGINE SPEED SIGNAL

Description

• The engine speed signal is transmitted to 4WAS main control unit via CAN communication.

DTC Logic

INFOID:000000001666435

INFOID:000000001666434

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause	
C1921	ENG REV SIGNAL	Malfunction is detected in engine speed signal that is output from ECM via CAN communication. (Improper signal is input engine speed.)	Engine speed signal error	

DTC CONFIRMATION PROCEDURE

1. RECHECK DTC	F
 With CONSULT-III 1. Turn the ignition switch from OFF to ON. 2. Perform 4WAS main control unit self-diagnosis. 	STC
<u>Is DTC "C1921" detected?</u> YES >> Proceed to diagnosis procedure. Refer to <u>STC-115, "Diagnosis Procedure"</u> . NO >> INSPECTION END	Н
Diagnosis Procedure	
1.PERFORM ECM SELF-DIAGNOSIS	I
With CONSULT-III Perform ECM self-diagnosis.	J
Is any error system detected? YES >> Check the error system. NO >> GO TO 2.	K
2.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)	
With CONSULT-III Perform 4WAS main control unit self-diagnosis.	L
<u>Is DTC "U1000" or "U1010" detected?</u> YES >> Check the error system. NO >> GO TO 3.	Μ
3. PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)	N
With CONSULT-III Perform 4WAS main control unit self-diagnosis.	IN
<u>Is DTC "C1921" detected?</u> YES >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u> . NO >> GO TO 4.	0
4.INFORMATION CHECK	Ρ
With CONSULT-III Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155,</u> "Reference Value".	

Is each data the standard value?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.

NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

STC-115

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Special Repair Requirement

INFOID:000000001666437

BEFORE REPLACING 4WAS MAIN CONTROL UNIT

- Record the self-diagnosis results (history). CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

C1923 STEERING ANGLE SEN

Items

(CONSULT-III screen terms)

STEERING ANGLE SEN

[NO CHANGE]

Description

Steering angle sensor signal is transmitted from steering angle sensor to 4WAS main control unit via CAN communication.

munication.

Diagnostic item is detected when...

Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN com-

[Steering angle sensor input signal error is detected when driving at 60 km/h (37MPH) or more.]

DTC Logic

DTC

C1923

INFOID:000000001666439

Possible cause

Steering angle sensor in-

put signal error

DTC DETECTION LOGIC

DTC CONFIRMATION PROCEDURE	F
1. RECHECK DTC	ST
 With CONSULT-III Drive at 60 km/h (38MPH) or more for 3 minutes or more. Perform 4WAS main control unit self-diagnosis. 	Н
<u>Is DTC "C1923" detected?</u> YES >> Proceed to diagnosis procedure. Refer to <u>STC-117, "Diagnosis Procedure"</u> . NO >> INSPECTION END	
Diagnosis Procedure	
1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS	J
With CONSULT-III Perform ABS actuator and electric unit (control unit) self-diagnosis.	K
<u>Is any error system detected?</u> YES >> Check the error system. NO >> GO TO 2.	L
2.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)	
With CONSULT-III Perform 4WAS main control unit self-diagnosis. Is DTC "U1000" or "U1010" detected?	Μ
YES >> Check the error system. NO >> GO TO 3.	Ν
3. PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)	
With CONSULT-III Perform 4WAS main control unit self-diagnosis. Is DTC "C1923" detected?	0
YES >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u> . NO >> GO TO 4.	Ρ
4.INFORMATION CHECK	
With CONSULT-III Charles the "DATA MONITOD" visiting of each DTC detected with the call diagnosis function. Defer to STC 155	

Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155.</u> <u>"Reference Value"</u>.

Is each data the standard value?

INFOID:000000001878424

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C1923 STEERING ANGLE SEN

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

- YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
- NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

Special Repair Requirement

INFOID:000000001666441

BEFORE REPLACING 4WAS MAIN CONTROL UNIT

- Record the self-diagnosis results (history).
 - **CAUTION:**
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

AFTER REPLACING STEERING ANGLE SENSOR

1.PERFORM ACTIVE TEST (LOCK OPERATION)

With CONSULT-III

- T. Stop vehicle with front wheels in the straight-ahead position.
- 2. Turn the ignition switch ON. CAUTION: Never start engine.
- 3. Select "LOCK OPERATION" item on "ACTIVE" of 4WAS front control unit.
- 4. Perform "RELEASE" of "ACTIVE TEST".
- CAUTION:
 - Turn steering wheel 90°, and then check that front tire does not move.
 - Never turn steering wheel 1 turn or more while performing "RELEASE".
- 5. Place steering wheel in neutral position.
- 6. Perform "LOCK" item on "ACTIVE TEST" of 4WAS front control unit.
- 7. Steer 30° leftward slowly. Steer 30° rightward and return the steering wheel to the straight-ahead position.
- 8. Complete active test of 4WAS front control unit.

>> GO TO 2.

2.steering angle sensor neutral position adjustment

With CONSULT-III

- 1. Adjust steering angle sensor neutral position. Refer to <u>BRC-8</u>, "ADJUSTMENT OF STEERING ANGLE <u>SENSOR NEUTRAL POSITION : Special Repair Requirement"</u>.
- 2. Turn the ignition switch OFF.

>> GO TO 3.

 ${f 3.}$ RETURN TO 4WAS FRONT ACTUATOR INITIAL POSITION

1. Start engine. CAUTION:

Check condition with the vehicle stopped.

- 2. Turn steering wheel to the left by 90° slowly, and then turn to the right by 90°.
- 3. Again, turn steering wheel to the left by 90° slowly, and then turn to the right by 90° so that it faces straight ahead.
- 4. Stop vehicle with front wheels in the straight-ahead position after driving vehicle for a short time. (Engine starting)

>> GO TO 4.

4.CHECK 4WAS FRONT ACTUATOR

With CONSULT-III

1. Check "4WAS STR ANG" item on "DATA MONITOR" of 4WAS front control unit. CAUTION:

Never touch steering wheel while performing.

4WAS STR ANG : -3.5 - 3.5deg	А
2. Turn the ignition switch OFF.	
<u>Is the inspection result normal?</u> YES >> GO TO 5.	В
NO $>>$ GO TO 1.	
5.PERFORM ACTIVE TEST (SLOW MODE)	С
With CONSULT-III	
1. Start engine. CAUTION:	D
Check condition with the vehicle stopped.	D
 Select "SLOW MODE" item on "ACTIVE TEST" of 4WAS front control unit. Perform "MODE START" of "ACTIVE TEST". 	
Turn steering wheel to the left slowly until it stops.	Е
 Turn steering wheel to the right slowly until it stops. Does "OK" display on both the left and right sides on "SLOW MODE" items of the monitor? 	
YES >> GO TO 6.	F
NO >> Refer to STC-30, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special	
Repair Requirement (Pattern 4)".	STC
6.PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)	310
With CONSULT-III Perform 4WAS front control unit self-diagnosis.	
Is malfunction detected?	Н
YES >> Check malfunctioning circuit.	
NO >> GO TO 7.	
.ERASE ERROR RECORD	
With CONSULT-III Erase memories of self-diagnosis results for 4WAS front control unit and 4WAS main control unit.	J
>> END	К
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C1924 STEERING ANGLE SEN

Description

Steering angle sensor signal is transmitted from steering angle sensor to 4WAS main control unit via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1924	STEERING ANGLE SEN [NO NEUT STATE]	Driving continuously at 10 km (6 mile) or more while the steering angle sensor value is not L10° - R10°. (Not detected in 4WAS front control unit fail-safe mode)	Steering angle sensor in-

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- T. Drive continuously for 10 km (6 mile) or more.
- 2. Perform 4WAS main control unit self-diagnosis.

Is DTC "C1924" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>STC-120, "Diagnosis Procedure"</u>.

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK DRIVING

Drive for a short time.

Does the vehicle drive with front wheels in the straight-ahead position?

YES >> GO TO 2.

NO >> Adjust the wheel alignment. Refer to FSU-7, "Wheel Alignment Inspection".

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

With CONSULT-III

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

Is malfunction detected?

YES >> Check malfunctioning circuit.

NO >> GO TO 3.

3.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

Perform 4WAS main control unit self-diagnosis.

Is DTC "U1000" or "U1010" detected?

YES >> Check malfunctioning circuit.

NO >> GO TO 4.

4.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

Perform 4WAS main control unit self-diagnosis.

Is DTC "C1924" detected?

YES >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

NO >> GO TO 5.

STC-120

INEQID:000000001666443

INFOID:000000001666444

INFOID:000000001878425

C1924 STEERING ANGLE SEN

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

5. CHECK INFORMATION	А
With CONSULT-III Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155.</u> <u>"Reference Value"</u> .	В
Is each data standard?	
 YES >> Check pin terminal and connection of each harness connector for non-standard conditions. NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>. 	С
Special Repair Requirement	
BEFORE REPLACING 4WAS MAIN CONTROL UNIT • Record the self-diagnosis results (history). CAUTION:	D
 Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis. Erase the memory of the self diagnosis results (record) after printing out or recording all the value. 	E
 Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR". 	F
AFTER REPLACING STEERING ANGLE SENSOR	
1.PERFORM ACTIVE TEST (LOCK OPERATION)	STC
With CONSULT-III	310
 Stop vehicle with front wheels in the straight-ahead position. Turn the ignition switch ON. CAUTION: 	Н
 Never start engine. 3. Select "LOCK OPERATION" item on "ACTIVE" of 4WAS front control unit. 	
 Perform "RELEASE" of "ACTIVE TEST". CAUTION: 	I
 Turn steering wheel 90°, and then check that front tire does not move. Never turn steering wheel 1 turn or more while performing "RELEASE". Place steering wheel in neutral position. 	J
 Perform "LOCK" item on "ACTIVE TEST" of 4WAS front control unit. Steer 30° leftward slowly. Steer 30° rightward and return the steering wheel to the straight-ahead position. Complete active test of 4WAS front control unit. 	K
>> GO TO 2.	
2.STEERING ANGLE SENSOR NEUTRAL POSITION ADJUSTMENT	L
With CONSULT-III Adjust steering angle sensor neutral position. Refer to <u>BRC-8</u>, "ADJUSTMENT OF STEERING ANGLE <u>SENSOR NEUTRAL POSITION : Special Repair Requirement"</u>. 	Μ
2. Turn the ignition switch OFF.	N
>> GO TO 3.	IN
3. RETURN TO 4WAS FRONT ACTUATOR INITIAL POSITION	\bigcirc
1. Start engine. CAUTION:	0
 Check condition with the vehicle stopped. 2. Turn steering wheel to the left by 90° slowly, and then turn to the right by 90°. 3. Again, turn steering wheel to the left by 90° slowly, and then turn to the right by 90° so that it faces straight ahead. 	Ρ
4. Stop vehicle with front wheels in the straight-ahead position after driving vehicle for a short time. (Engine starting)	
>> GO TO 4.	

4.CHECK 4WAS FRONT ACTUATOR

(B) With CONSULT-III

1. Check "4WAS STR ANG" item on "DATA MONITOR" of 4WAS front control unit. CAUTION:

Never touch steering wheel while performing.

4WAS STR ANG : -3.5 - 3.5deg

2. Turn the ignition switch OFF.

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 1.

5.PERFORM ACTIVE TEST (SLOW MODE)

With CONSULT-III

Start engine. CAUTION: Check condition with the vehicle stopped.

- 2. Select "SLOW MODE" item on "ACTIVE TEST" of 4WAS front control unit.
- 3. Perform "MODE START" of "ACTIVE TEST".
- 4. Turn steering wheel to the left slowly until it stops.
- 5. Turn steering wheel to the right slowly until it stops.

Does "OK" display on both the left and right sides on "SLOW MODE" items of the monitor?

- YES >> GO TO 6.
- NO >> Refer to <u>STC-30</u>, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special <u>Repair Requirement (Pattern 4)</u>".

6.PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)

With CONSULT-III

Perform 4WAS front control unit self-diagnosis.

Is malfunction detected?

YES >> Check malfunctioning circuit.

NO >> GO TO 7.

7.ERASE ERROR RECORD

With CONSULT-III

Erase memories of self-diagnosis results for 4WAS front control unit and 4WAS main control unit.

>> END

C1926, C1932 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

C1926, C1932 STEERING ANGLE SENSOR

Description

Steering angle sensor signal is transmitted from steering angle sensor to 4WAS main control unit via CAN communication.

DTC Logic

INFOID:000000001666447

INFOID:000000001878426

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1926	STEERING ANGLE SEN	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN com- munication. (When improper signal inputs to steering angle sensor and steering angle sensor itself detects the malfunc- tion)	Steering angle sensor er- ror
C1932	STEERING ANGLE SEN	If the steering angle sensor error is detected. (Steering angle sensor output value is abnormal.)	Steering angle sensor in- put signal error
TC CONFI	RMATION PROCEDURE		
With CONS Start the e CAUTION Stop the	SULT-III engine. N: vehicle.		
 Turn the steering wheel leftward slowly. Steer until the turning stops. Turn the steering wheel rightward slowly. Steer to the straight-forward position. Perform 4WAS main control unit self-diagnosis. <u>Is DTC "C1926" or "C1932" detected?</u> 			
YES >> P		lure. Refer to <u>STC-123, "Diagnosis Procedure"</u>	
Diagnosis I	Procedure		INFOID:000000001666448
	ABS ACTUATOR AND EL	ECTRIC UNIT (CONTROL UNIT) SELF-DIAG	NOSIS

With CONSULT-III

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

Is any error system detected?

YES >> Check the error system. NO >> GO TO 2. 2.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

(P)With CONSULT-III

Perform 4WAS main control unit self-diagnosis

Is DTC "U1000" or "U1010" detected?

YES >> Check the error system.

NO >> GO TO 3.

3. perform self-diagnosis (4was main control unit)

With CONSULT-III

Perform 4WAS main control unit self-diagnosis

Is DTC "C1926" or "C1932" detected?

C1926 >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

STC-123

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C1926, C1932 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

C1932 >> Replace steering angle sensor. Refer to <u>BRC-105</u>, "Exploded View".

NO >> GO TO 4.

4.INFORMATION CHECK

With CONSULT-III

Check the "DATA MONITOR" value of each DTC detected with the self-diagnosis function. Refer to <u>STC-155.</u> "Reference Value".

Is each data the standard value?

- YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
- NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

Special Repair Requirement

INFOID:000000001666449

BEFORE REPLACING 4WAS MAIN CONTROL UNIT

- Record the self-diagnosis results (history).
 CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis.
- Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

AFTER REPLACING STEERING ANGLE SENSOR

1.PERFORM ACTIVE TEST (LOCK OPERATION)

With CONSULT-III

- T. Stop vehicle with front wheels in the straight-ahead position.
- 2. Turn the ignition switch ON. CAUTION:

Never start engine.

- 3. Select "LOCK OPERATION" item on "ACTIVE" of 4WAS front control unit.
- 4. Perform "RELEASE" of "ACTIVE TEST".
 - CAUTION:
 - Turn steering wheel 90°, and then check that front tire does not move.
 - Never turn steering wheel 1 turn or more while performing "RELEASE".
- 5. Place steering wheel in neutral position.
- 6. Perform "LOČK" item on "ACTIVE TEST" of 4WAS front control unit.
- 7. Steer 30° leftward slowly. Steer 30° rightward and return the steering wheel to the straight-ahead position.
- 8. Complete active test of 4WAS front control unit.

>> GO TO 2.

2. STEERING ANGLE SENSOR NEUTRAL POSITION ADJUSTMENT

With CONSULT-III

- 1. Adjust steering angle sensor neutral position. Refer to <u>BRC-8</u>, "ADJUSTMENT OF STEERING ANGLE <u>SENSOR NEUTRAL POSITION : Special Repair Requirement"</u>.
- 2. Turn the ignition switch OFF.

>> GO TO 3.

$\mathbf{3}$. RETURN TO 4WAS FRONT ACTUATOR INITIAL POSITION

1. Start engine. CAUTION:

Check condition with the vehicle stopped.

- 2. Turn steering wheel to the left by 90° slowly, and then turn to the right by 90° .
- 3. Again, turn steering wheel to the left by 90° slowly, and then turn to the right by 90° so that it faces straight ahead.
- 4. Stop vehicle with front wheels in the straight-ahead position after driving vehicle for a short time. (Engine starting)

C1926, C1932 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >	[WITH 4WAS]
>> GO TO 4.	
4. CHECK 4WAS FRONT ACTUATOR	
 With CONSULT-III Check "4WAS STR ANG" item on "DATA MONITOR" of 4WAS front control unit. CAUTION: Never touch steering wheel while performing. 	
4WAS STR ANG : –3.5 – 3.5deg	
2. Turn the ignition switch OFF.	
Is the inspection result normal?	
YES >> GO TO 5. NO >> GO TO 1.	
5.PERFORM ACTIVE TEST (SLOW MODE)	
 With CONSULT-III Start engine. CAUTION: Check condition with the vehicle stopped. Select "SLOW MODE" item on "ACTIVE TEST" of 4WAS front control unit. 	
3. Perform "MODE START" of "ACTIVE TEST".	
 Turn steering wheel to the left slowly until it stops. Turn steering wheel to the right slowly until it stops. 	
Does "OK" display on both the left and right sides on "SLOW MODE" items of the monitor?	
YES >> GO TO 6.	
NO >> Refer to <u>STC-30</u> , "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUST	<u>MENT : Special</u>
Repair Requirement (Pattern 4)". 6.PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT)	
With CONSULT-III Perform 4WAS front control unit self-diagnosis.	
Is malfunction detected?	
YES >> Check malfunctioning circuit.	
NO >> GO TO 7. 7 EDA 05 EDD 00 DE 00 DE	
I.ERASE ERROR RECORD	
With CONSULT-III Erase memories of self-diagnosis results for 4WAS front control unit and 4WAS main control	unit.
>> END	

C1930 4WAS FRONT CONTROL UNIT

Description

• It transmits the value calculated by 4WAS main control unit to 4WAS front control unit via 4WAS communication line (line for 4WAS system only). 4WAS front control unit controls 4WAS front actuator according to the received command value.

DTC Logic

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
C1930	4WAS FRONT ECU	An error is detected on 4WAS front control unit side. (4WAS front control unit fail-safe mode)	4WAS front control unit fail-safe mode

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- 1. Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS main control unit self-diagnosis.

Is DTC "C1930" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-126. "Diagnosis Procedure"</u>.
- NO >> INSPECTION END

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

Perform 4WAS main control unit self-diagnosis.

Is any DTC other than "C1930" detected?

YES >> Check the error system.

NO >> Perform 4WAS front control unit self-diagnosis.

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< COMPONENT DIAGNOSIS >

C1931 4WAS FRONT CONTROL UNIT COMMUNICATION

Description

- 4WAS front control unit and 4WAS main control unit transmit/receive information to/from each other for optimum control of the 4WAS system with the specified 4WAS system line (4WAS communication line) between 4WAS front control unit and 4WAS main control unit.
- Be careful to repair wirings because 4WAS system specified line adopts twisted-pair wires. Refer to STC-176, "Precautions for Harness Repair".

DTC Logic

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DTC DETECTION LOGIC

DTC	(CONSU	Items LT-III screen terms) Diagnostic item is detected when	Possible cause	
C1931	4WAS FR	ONT ECU COMM	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS front control unit.)	4WAS communication line*/4WAS front control unit/4WAS main control unit error	
Communicati	on line betwee	n 4WAS front conti	ol unit and 4WAS main control unit.		
TC CONF	IRMATION	PROCEDUR	E		
1.RECHEC	K DTC				
1. Turn the	ignition swi	tch from OFF to control unit se	o ON. If-diagnosis		
s DTC "C19					
			dure. Refer to STC-127, "Diagnosis Procedure) ".	
	NSPECTIO			_	
	NSPECTIO	NĔND		INFOID:000000001666455	
NO >> Diagnosis	NSPECTIO Procedu	N ĔND re			
NO >> Diagnosis 1.CHECK (NSPECTIO Procedu	N ĚND re Ation line (1			
NO >> Diagnosis 1.CHECK (1. Turn the 2. Disconn 3. Disconn 4. Disconn 5. Disconn	NSPECTIO Procedu COMMUNIC ignition swi ect ABS act ect yaw rate ect 4WAS fr ect 4WAS m	N ÈND re ATION LINE (1 tch OFF. uator and elect e/side G sensor ont control unit nain control unit) ric unit (control unit) harness connector. harness connector. harness connector. t harness connector.	INFOID:000000001666455	
NO >> Diagnosis 1.CHECK (1. Turn the 2. Disconn 3. Disconn 4. Disconn 5. Disconn 6. Check t	NSPECTIO Procedu COMMUNIC ignition swi ect ABS act ect yaw rate ect 4WAS fr ect 4WAS m ne continuity	N ÈND re ATION LINE (1 tch OFF. uator and elect e/side G sensor ont control unit nain control unit) ric unit (control unit) harness connector. harness connector. harness connector. t harness connector. S actuator and electric unit (control unit) harn	INFOID:000000001666455	
NO >> Diagnosis 1.CHECK (1. Turn the 2. Disconn 3. Disconn 4. Disconn 5. Disconn 6. Check t	NSPECTIO Procedu COMMUNIC ignition swi ect ABS act ect ABS act ect yaw rate ect 4WAS fr ect 4WAS m the continuity G sensor h	N ÈND re ATION LINE (1 tch OFF. uator and elect e/side G sensor ont control unit nain control unit y between ABS) ric unit (control unit) harness connector. harness connector. harness connector. harness connector. S actuator and electric unit (control unit) harn tor.	INFOID:000000001666455	
NO >> Diagnosis 1.CHECK (1. Turn the 2. Disconn 3. Disconn 4. Disconn 5. Disconn 6. Check the rate/side	NSPECTIO Procedu COMMUNIC ignition swi ect ABS act ect ABS act ect yaw rate ect 4WAS fr ect 4WAS m the continuity G sensor h	N ÈND re ATION LINE (1 tch OFF. uator and elect solution of the sensor ont control unit on control unit y between ABS harness connec) ric unit (control unit) harness connector. harness connector. harness connector. harness connector. S actuator and electric unit (control unit) harr tor.	INFOID:000000001666455	
NO >> Diagnosis 1.CHECK (1. Turn the 2. Disconn 3. Disconn 4. Disconn 5. Disconn 6. Check the rate/side ABS actuato unit (cor	NSPECTIO Procedu OMMUNIC ignition swi ect ABS act ect ABS act ect 4WAS fr ect 4WAS fr ect 4WAS m e continuity G sensor h	N ÈND re ATION LINE (1 tch OFF. uator and elect side G sensor ont control unit pain control unit y between ABS harness connec Yaw rate/side () ric unit (control unit) harness connector. harness connector. harness connector. harness connector. S actuator and electric unit (control unit) harn tor.	INFOID:000000001666455	

>> Repair or replace the harnesses and connectors. Refer to STC-176. "Precautions for Harness NO Repair".

2.CHECK COMMUNICATION LINE (2)

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

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[WITH 4WAS]

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< COMPONENT DIAGNOSIS >

ABS a	Continuity		
Connector	Connector Terminal		
F41	25 – Ground	Not existed	
L41	45 – Ground	NOT EXISTED	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176</u>, "Precautions for Harness <u>Repair"</u>.

3.CHECK COMMUNICATION LINE (3)

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

ABS a	ABS actuator and electric unit (control unit)		
Connector	Connector Terminal		
E41	25 – 45	Not existed	

Is the inspection result normal?

YES >> GO TO 4.

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

Check the continuity between ABS actuator and electric unit (control unit) connector. Refer to <u>STC-84, "Component Inspection [ABS Actuator and Electric Unit (Control Unit)]</u>".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.

5.CHECK YAW RATE/SIDE G SENSOR

Check the continuity between yaw rate/side G sensor connector. Refer to <u>STC-84, "Component Inspection</u> (Yaw Rate/Side G Sensor)".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace yaw rate/side G sensor. Refer to <u>BRC-104, "Exploded View"</u>.

6.CHECK CAN DIAGNOSIS SUPPORT MONITOR (4WAS FRONT CONTROL UNIT)

With CONSULT-III

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect yaw rate/side G sensor harness connector.
- 3. Connect 4WAS front control unit harness connector.
- 4. Connect 4WAS main control unit harness connector.
- 5. Start the engine.

CAUTION: Stop the vehicle.

- 6. Perform CAN diagnosis support monitor of 4WAS front control unit.
- 7. Replace 4WAS main control unit error history. Refer to <u>STC-39. "CONSULT-III Function</u> [4WAS(FRONT)]".

What is the indicated item?

All items are "OK">>GO TO 7.

"TRANSMIT DIAG" is other than "OK">>GO TO 7.

"4WAS(MAIN)" is other than "OK">>GO TO 8.

1.CHECK 4WAS FRONT CONTROL UNIT CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect 4WAS front control unit harness connector.
- 3. Disconnect ABS actuator and electric unit (control unit) harness connector.

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NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176</u>, "Precautions for Harness <u>Repair"</u>.

< COMPONENT DIAGNOSIS >

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

4WAS front control unit		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector Terminal		
M42	14	F41	25	Existed
10142	25	L41	45	LAISted

5. Check that 4WAS front control unit connector No. 14 terminal and No. 25 are connected properly and not deformed.

Is the inspection result normal?

- YES >> Replace 4WAS front control unit. Refer to STC-177, "Exploded View".
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176. "Precautions for Harness</u> E <u>Repair"</u>.

8. CHECK 4WAS MAIN CONTROL UNIT CIRCUIT

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

4WAS	4WAS main control unit		ABS actuator and electric unit (control unit)		Continuity
Connec	ctor	Terminal	Connector	Terminal	
B54	DE4	31	E41	45	Existed
D34		32		25	LAISteu

 Check that 4WAS main control unit connector No. 31 terminal and No. 32 are connected properly and not deformed.

Is the inspection result normal?

- YES >> Replace 4WAS main control unit. Refer to STC-178. "Exploded View".
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176</u>, "Precautions for Harness K <u>Repair</u>".

Component Inspection [ABS Actuator and Electric Unit (Control Unit)]

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

1. Turn the ignition switch OFF.

2. Remove ABS actuator and electric unit (control unit). Refer to <u>BRC-102, "Exploded View"</u>.

3. Check the resistance between ABS actuator and electric unit (control unit) connector terminals.

ABS actuator	r and electric unit (control unit)	Resistance (Approx.)
Connector	Terminal	
E41	25 – 45	120 Ω
YES >> II	ion result normal? NSPECTION END	
NO >> R	Replace ABS actuator and e	electric unit (control u
Componer	nt Inspection (Yaw Ra	ate/Side G Senso
4		

1.CHECK YAW RATE/SIDE G SENSOR

1. Turn the ignition switch OFF.

2. Remove yaw rate/side G sensor. Refer to BRC-104, "Exploded View".

3. Check the resistance between yaw rate/side G sensor connector terminals.

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Y	aw rate/side G sensor	Resistance (Approx.)
Connector	Terminal	
M143	2-3	120 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace yaw rate/side G sensor.

Special Repair Requirement

INFOID:000000001666458

BEFORE REPLACING 4WAS FRONT CONTROL UNIT

- Record the self-diagnosis results (history). CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS front control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

BEFORE REPLACING 4WAS MAIN CONTROL UNIT

- Record the self-diagnosis results (history). CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

AFTER REPLACING 4WAS FRONT CONTROL UNIT

• Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28, "4WAS</u> <u>FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)"</u>.

U1000 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

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
U1000	CAN COMM	When 4WAS main control unit is not transmitting or re- ceiving CAN communication signal for 2 seconds or more.	CAN communication er- ror
DTC CONFIR	MATION PROCEDURE		
1.RECHECK	DTC		
	nition switch from OFF to VAS main control unit self		
YES >> Pro		lure. Refer to <u>STC-131, "Diagnosis Procedure"</u>	
Diagnosis P	rocedure		INFOID:000000001666461
1.PERFORM	SELF-DIAGNOSIS (4WAS	S MAIN CONTROL UNIT)	
	main control unit self-diag	,	
<u>Is DTC "U1000</u>			
	rform CAN diagnosis. SPECTION END.		
	air Requirement		INFOID:000000001666462
			IN 012.00000001000402
-	PLACING 4WAS MAIN (elf-diagnosis results (histo		
Never eras		of self-diagnosis results when replacing 4W	AS main control unit
		nosis results (record) after printing out or	recording all the val-

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U1010 CONTROL UNIT (CAN)

Description

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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:000000001666464

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when	Possible cause
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of 4WAS main control unit.	CAN communication line/ 4WAS main control unit/ ECM/ABS actuator and electric unit (control unit) error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

- Turn the ignition switch from OFF to ON.
- 2. Perform 4WAS main control unit self-diagnosis.

Is DTC "U1010" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>STC-132, "Diagnosis Procedure"</u>.
- NO >> INSPECTION ĔND

Diagnosis Procedure

INFOID:000000001666465

1.4WAS MAIN CONTROL UNIT

Check that there is no malfunction in 4WAS main control unit harness connector or disconnection.

Is the inspection result normal?

- YES >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.
- NO >> Repair or replace the harnesses and connectors. Refer to <u>STC-176, "Precautions for Harness</u> <u>Repair"</u>.

Special Repair Requirement

INFOID:000000001666466

BEFORE REPLACING 4WAS MAIN CONTROL UNIT

- Record the self-diagnosis results (history).
 CAUTION:
 - Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis.
 - Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

POWER SUPPLY AND GROUND CIRCUIT

< COMPONENT	DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Description

4WAS system power supply

Diagnosis Procedure (4WAS Front Control Unit)

1.CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect 4WAS front control unit harness connector.
- 3. Check the voltage between 4WAS front control unit harness connectors and the ground.

4	WAS front control unit	Voltage (Approx.)
Connector	Terminal	voltage (rippiox.)
M41	11 – Ground	Battery voltage
M42	15 – Ground	0 V

4. Turn the ignition switch ON. CAUTION:

Never start the engine.

5. Check the voltage between 4WAS front control unit harness connectors and the ground.

4	WAS front control unit	Voltage (Approx.)	
Connector	Terminal	Voltage (Approx.)	
M41	11 – Ground	Potton voltage	
M42	15 – Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 2. NO >> Check th

- >> Check the following items. Repair or replace the malfunctioning parts.
 - 40A fusible link (#I) open
 - Short among 40A fusible link (#I) connector, 4WAS front control unit harness connector No. 11 terminal and the ground
 - Open between the battery and 4WAS front control unit harness connector No. 11 terminal
 - 10A fuse (#3) open
 - Short among 10A fuse (#3) connector, 4WAS front control unit harness connector No. 15 terminal and the ground
 - Short among 10A fuse (#3) connector, unified meter and A/C amp No. 53 terminal and the ground
 - Open between the ignition switch and 4WAS front control unit harness connector No. 15 terminal
 - Battery or ignition switch

2.CHECK 4WAS FRONT CONTROL UNIT GROUND

Check the continuity between 4WAS front control unit harness connector and the ground.

	4WAS front control unit	Continuity
Connector	Terminal	Continuity
M41	12 – Ground	
M42	18 – Ground	Existed
IVI4Z	34 – Ground	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace the harnesses and connectors.

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POWER SUPPLY AND GROUND CIRCUIT

< COMPONENT DIAGNOSIS >

Diagnosis Procedure (4WAS Main Control Unit)

[WITH 4WAS]

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1.CHECK 4WAS MAIN CONTROL UNIT POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect 4WAS main control unit harness connector.
- 3. Check the voltage between 4WAS main control unit harness connectors and the ground.

4WAS main control unit		Voltage (Approx.)
Connector	Terminal	voltage (Applox.)
B54	27 – Ground	0 V

4. Turn the ignition switch ON. CAUTION:

Never start the engine.

5. Check the voltage between 4WAS main control unit harness connectors and the ground.

4	WAS main control unit	Voltage (Approx.)
Connector	Terminal	Vollage (Applox.)
B54	27 – Ground	Battery voltage

Is the inspection result normal?

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

- >> Check the following items. Repair or replace the malfunctioning parts.
 - 10A fuse (#45) open
 - Short among 10Å fuse (#45) connector, 4WAS main control unit harness connector No. 27 terminal and the ground
 - Open between the ignition switch and 4WAS main control unit harness connector No. 27 terminal
 - Ignition switch

2.CHECK 4WAS REAR MOTOR POWER SUPPLY CIRCUIT (1)

- 1. Turn the ignition switch OFF.
- 2. Remove 4WAS rear motor relay.
- 3. Check the continuity between 4WAS rear motor relay harness connector and the ground.

	4WAS rear motor relay	Continuity
Connector	Terminal	Continuity
B53	1 – Ground	Existed
000	2 – Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the harnesses and connectors.

3.CHECK 4WAS REAR MOTOR POWER SUPPLY CIRCUIT (2)

Check the voltage between 4WAS rear motor relay harness connector and the ground.

4	WAS rear motor relay	Voltage (Approx.)
Connector	Terminal	Vollage (Applox.)
B53	3 – Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO

- >> Check the following items. Repair or replace the malfunctioning parts.
 - 20A fuse (#37) open
 - Short among 20A fuse (#37) connector, 4WAS rear motor relay harness connector No. 3 terminal and the ground

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< COMPON	ENT DIAG	NOSIS >							=	H 4WAS
4	•	veen the battery				y harnes	ss conne	ector N	o. 3 termi	nal
4.CHECK 4	IWAS REAF	R MOTOR POWE	R SUPPL	Y CIRCUI	IT (3)					
	the noise s					_1				
2. Check c	continuity de	tween the noise s	suppresso	or narness	conne	ctor and	the gro	una.		
	Noise s	uppressor			-					
Connector		Terminal		Continuity						
DEL		3 – Ground			_					
B51		5 – Ground		Not existed						
B52		1 – Ground		Not existed	_					
DJZ		2 – Ground		Existed	_					
Is the inspec	tion result r	ormal?			-					
-	GO TO 5.	alaas (b. 1								
_	•	place the harnes								
		R MOTOR POWE			11 (4)					
		n control unit har	ness conn	nector.						
	ignition swi	ICH UN.								
CAUTIC										
CAUTIC Never s										
Never s	<mark>)N:</mark> tart the eng		ain contro	ol unit harn	iess co	nnector	S.			
Never s 3. Check th	DN: tart the eng he voltage b	jine. etween 4WAS m	ain contro	ol unit harn	iess co	nnector	S.			
Never s 3. Check tl 4\	DN: tart the eng ne voltage b	jine. etween 4WAS m ^{rrol unit}		ol unit harn (Approx.)	iess co -	nnector	S.			
Never s 3. Check th 4\ Connector	DN: tart the eng ne voltage b WAS main cont	jine. etween 4WAS m rol unit erminal	Voltage ((Approx.)	ness co _	nnector	s.			
Never s 3. Check th 4 Connector B54	DN: tart the eng ne voltage b WAS main cont Tr 25 -	jine. etween 4WAS m rol unit erminal - Ground	Voltage (ness co - -	nnector	S.			
Never s 3. Check the 4 Connector B54 4. Turn the	DN: tart the engine voltage b WAS main cont Tr 25 - e ignition swi	gine. etween 4WAS m rol unit erminal - Ground itch OFF.	Voltage ((Approx.)	ness co - -	nnector	S.			
Never s 3. Check the 4. Connector B54 4. Turn the Is the inspector	DN: tart the eng ne voltage b WAS main cont Tr 25 - e ignition swi ction result n	gine. etween 4WAS m rol unit erminal - Ground itch OFF.	Voltage ((Approx.)	ness co - -	nnector	s.			
Never s 3. Check the 4. Connector B54 4. Turn the Is the inspector YES >>	N: tart the eng ne voltage b WAS main cont Tr 25 - e ignition switching ction result n GO TO 6.	gine. etween 4WAS m rol unit erminal - Ground itch OFF.	Voltage (Battery	(Approx.) voltage	-					
Never s 3. Check the Connector B54 4. Turn the Is the inspect YES >> NO >>	N: tart the engine voltage b NAS main cont Tr 25 - e ignition switching ction result n GO TO 6. Replace 4W	gine. etween 4WAS m rol unit erminal - Ground tch OFF. ormal?	Voltage (Battery unit. Refe	(Approx.) voltage	-					
Never s 3. Check the Connector B54 4. Turn the Is the inspect YES >> NO >> 6.CHECK 4	N: tart the eng ne voltage b WAS main cont Tr 25 e ignition switching ction result r GO TO 6. Replace 4W WAS REAF	gine. etween 4WAS m rol unit erminal - Ground itch OFF. formal? /AS main control & MOTOR RELAY	Voltage (Battery unit. Refe r	(Approx.) voltage	- - 178, "E	xplodec	<u>View"</u> .	nal.		
A connector B54 4. Turn the Is the inspect YES >> NO >> 6.CHECK 4 1. Apply 12 CAUTIC	N: tart the engine voltage b NAS main cont Tr 25 - e ignition switching ction result r GO TO 6. Replace 4W WAS REAF WAS REAF 2 V to 4WAS	gine. etween 4WAS m rol unit erminal - Ground itch OFF. formal? /AS main control & MOTOR RELAY & rear motor relay	Voltage (Battery unit. Refe r	(Approx.) voltage	- - 178, "E	xplodec	<u>View"</u> .	nal.		
Never s 3. Check the Connector B54 4. Turn the Is the inspect YES >> NO >> 6.CHECK 4 1. Apply 12 CAUTIC • Never	N: tart the engine voltage b WAS main contended WAS main contended Transformer 25 - e ignition switch ignition result result result result GO TO 6. Replace 4W WAS REAF WAS REAF 2 V to 4WAS N: make the t	gine. etween 4WAS m rol unit erminal - Ground itch OFF. formal? /AS main control & MOTOR RELAY & rear motor relay erminals short.	Voltage (Battery unit. Refe Y connecto	(Approx.) voltage er to <u>STC-1</u> or No. 1 ter	- - 178, "E rminal	<u>xplodec</u> and No.	<u>View"</u> . 2 termi	nal.		
Never s 3. Check the AN Connector B54 4. Turn the Is the inspect YES >> NO >> 6.CHECK 4 1. Apply 12 CAUTIC • Never • Connector	N: tart the engine voltage b WAS main contended WAS main contended Transformer 25 - e ignition switch ignition result n GO TO 6. Replace 4W WAS REAF 2 V to 4WAS N: make the fuse	gine. etween 4WAS m rol unit erminal - Ground itch OFF. formal? /AS main control & MOTOR RELAY & rear motor relay	Voltage (Battery unit. Refe r connecto	(Approx.) voltage er to <u>STC-1</u> or No. 1 ter	- - - rminal ying t ł	xplodec and No.	<u>View"</u> . 2 termi ge.	nal.		
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Never s 3. Check the All Connector B54 4. Turn the Is the inspect YES >> NO >> 6.CHECK 4 1. Apply 12 CAUTIC • Never • Connector Connector	N: tart the engine voltage b WAS main cont Tr 25- e ignition switcher GO TO 6. Replace 4W WAS REAF 2 V to 4WAS N: make the the fuse he continuity 4WAS rear Terminal	gine. etween 4WAS m rol unit erminal - Ground itch OFF. formal? (AS main control R MOTOR RELAY 6 rear motor relay erminals short. between the te between 4WAS motor relay Condition Apply the voltage No. 1 terminal and	Voltage (Battery unit. Refe Y / connecto rminals w rear moto between No. 2 ter- oltage be- inal and	(Approx.) voltage er to <u>STC-1</u> or No. 1 ter vhen appl y or relay con	- - - rminal ying t ł	xplodec and No.	<u>View"</u> . 2 termi ge.	nal.		

4	WAS rear motor relay	Resistance (Approx.)
Connector	Terminal	Resistance (Approx.)
B53	1 – 2	50 Ω

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace 4WAS rear motor relay.

7.CHECK NOISE SUPPRESSOR

Check continuity between the noise suppressor connector terminals.

	Continuity			
Connector	Terminal	Connector	Terminal	Continuity
B51	3	B52	1	Existed
B51	3	B51	5	Not existed
B51	3	B52	2	Not existed
B51	5	B52	2	Existed
B51	5	B52	1	Not existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace the noise suppressor.

8.CHECK 4WAS REAR MOTOR POWER SUPPLY

1. Connect 4WAS main control unit harness connector.

- 2. Install 4WAS rear motor relay.
- 3. Install the noise suppressor.
- 4. Turn the ignition switch ON. CAUTION:

Never start the engine.

5. Check the voltage between 4WAS main control unit harness connectors and the ground.

4WAS main control unit		Voltage (Approx.)
Connector	Terminal	vollage (Applox.)
B54	37 – Ground	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END.

NO >> Replace 4WAS main control unit. Refer to <u>STC-178. "Exploded View"</u>.

Component Inspection (4WAS Rear Motor Relay)

1.CHECK 4WAS REAR MOTOR RELAY

- 1. Turn the ignition switch OFF.
- 2. Remove 4WAS rear motor relay connector.

3. Apply 12 V to 4WAS rear motor relay connector No. 1 terminal and No. 2 terminal. CAUTION:

• Never make the terminals short.

• Connect the fuse between the terminals when applying the voltage.

4. Check the continuity between 4WAS rear motor relay connector terminals.

4WAS rear motor relay			Continuity
Connector	Terminal	Condition	Continuity
B53		Apply the voltage between No. 1 terminal and No. 2 terminal.	Existed
600	3 – 5	Do not apply the voltage be- tween No. 1 terminal and No. 2 terminal.	Not existed

5. Check the resistance between 4WAS rear motor relay connector terminals.

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POWER SUPPLY AND GROUND CIRCUIT

< COMPONENT DIAGNOSIS >

[WITH 4WAS]

4	WAS rear motor relay	Resistance (Approx.)		
Connector	Terminal	Resistance (Approx.)		
B53	1 – 2	50 Ω		
Is the inspec	s the inspection result normal?			

YES >> INSPECTION END

NO >> Replace 4WAS rear motor relay.

Component Inspection (Noise Suppressor)

1.NOISE SUPPRESSOR INSPECTION

- 1. Turn the ignition switch OFF.
- 2. Remove the noise suppressor.
- 3. Check continuity between the noise suppressor connector terminals.

Noise suppressor				Continuity
Connector	Terminal	Connector	Terminal	Continuity
B51	3	B52	1	Existed
B51	3	B51	5	Not existed
B51	3	B52	2	Not existed
B51	5	B52	2	Existed
B51	5	B52	1	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace the noise suppressor.

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POWER STEERING SOLENOID VALVE

< COMPONENT DIAGNOSIS >

POWER STEERING SOLENOID VALVE

Description

• The power steering oil pressure in the gear housing assembly is controlled.

Diagnosis Procedure

1.CHECK POWER STEERING SOLENOID VALVE SIGNAL

With CONSULT-III

1. Start the engine.

2. Check "POWER STR SOL" item on "DATA MONITOR" of 4WAS main control unit.

Monitor item	Condition	Display value
POWER STR SOL	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	Approx. 1.10 A
	Vehicle speed: 100 km/h (62 MPH)	Approx. 0.42 A

Without CONSULT-III

1. Start the engine.

2. Check the voltage between 4WAS main control unit harness connector and the ground.

4WAS main control unit			Data (Approx.)
Connector	Terminal	Condition	
B54 36 -	36 – Ground	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	4.4 – 6.6 V
	30 – Gibunu	Vehicle speed: 100 km/h (62 MPH)	2.4 – 3.6 V

3. Check that there is no malfunction in 4WAS main control unit harness connector or disconnection.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace 4WAS main control unit. Refer to <u>STC-178, "Exploded View"</u>.

2. CHECK POWER STEERING SOLENOID VALVE CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect 4WAS main control unit harness connector.
- 3. Disconnect the power steering solenoid valve harness connector.
- 4. Check the continuity between 4WAS main control unit harness connector and power steering solenoid valve harness connector.

4WAS mair	n control unit	Power steering solenoid valve		Continuity
Connector	Terminal	Connector	Terminal	
B54	36	F45	1	Existed

5. Check the continuity between power steering solenoid valve harness connector and the ground.

	Continuity	
Connector	Continuity	
F45	2 – Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the harnesses and connectors.

[WITH 4WAS]

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[WITH 4WAS]

. Check the re		NOID VALVE	
	sistance between pow	ver steering solenoid valve connector terminals.	
Power stee	ering solenoid valve		
Connector	Terminal	– Resistance (Approx.)	
F45	1 – 2	$4-6 \Omega$	
between the CAUTION: • Never mail • Assign th	power steering solence ke the terminals shor e positive terminal to	No. 1 terminal, and the negative terminal to No. 2 t	·
		inals when applying the voltage.	
<u>s the inspection</u> YES >> INSF	PECTION END		
		efer to <u>ST-26, "Exploded View"</u> .	
Component I	nspection		INFOID:000000001666474
•	•		
.POWER STE	ERING SOLENOID VA	ALVE INSPECTION	
	ition switch OFF.		
		enoid valve harness connector.	
Check the re	sistance between pow	ver steering solenoid valve connector terminals.	
Power sto	ering solenoid valve		
Connector	Terminal	Resistance (Approx.)	
F45	1-2		
		$4-6 \Omega$	
between the CAUTION:	ck sound (power steer power steering solenc	$4-6 \Omega$ ing solenoid valve activation sound) when applying approid valve connector terminals.	oximately 12 V
between the CAUTION: • Never mai • Assign th nect the fu	ck sound (power steer power steering solenc ke the terminals shor e positive terminal to use between the term	ing solenoid valve activation sound) when applying appr id valve connector terminals.	
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4WAS WARNING LAMP

< COMPONENT DIAGNOSIS >

4WAS WARNING LAMP

Description

- Turn 4WAS warning lamp ON when ignition switch turns ON from OFF. Then, turn 4WAS warning lamp OFF after the engine is started.
- The check of 4WAS system is performed.
- 4WAS system stops (error) when turning 4WAS warning lamp ON.

Diagnosis Procedure

1.PERFORM UNIFIED METER AND A/C AMP. SELF-DIAGNOSIS

With CONSULT-III

Perform the self-diagnosis of the unified meter and A/C amp.

Is any error system detected?

YES >> Check the error system.

NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)

(R)With CONSULT-III

Perform 4WAS main control unit self-diagnosis.

Is DTC "U1000" or "U1010" detected?

YES >> Check the error system.

NO >> GO TO 3.

 ${\it 3.}$ PERFORM COMBINATION METER CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect the unified meter and A/C amp. harness connector.
- 3. Disconnect the combination meter harness connector.
- 4. Check the continuity between the unified meter and A/C amp. harness connector and the combination meter harness connector terminal.

Unified meter and A/C amp.		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M66	7	M53	3	Existed
M66	27	M53	2	LAISIEU

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Repair or replace the harnesses and connectors.

4.CHECK 4WAS WARNING LAMP SIGNAL

(R)With CONSULT-III

- 1. Connect the unified meter and A/C amp. harness connector.
- 2. Connect the combination meter harness connector.
- Disconnect 4WAS front control unit harness connector.
- 4. Turn the ignition switch ON. **CAUTION:** Never start the engine.

5. Check "WARNING LAMP" item on DATA MONITOR of 4WAS main control unit.

Does the item on "DATA MONITOR" indicate "On"?

YES >> GO TO 5.

NO >> Replace 4WAS main control unit. Refer to STC-178, "Exploded View".

5.CHECK COMBINATION METER

(P)With CONSULT-III

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4WAS WARNING LAMP

[WITH 4WAS] < COMPONENT DIAGNOSIS > Perform the trouble diagnosis of the combination meter. Refer to MWI-50, "COMBINATION METER : Diagnosis Procedure". А Is the inspection result normal? YES >> INSPECTION END NO >> Replace the combination meter. Refer to MWI-160, "Exploded View". В Special Repair Requirement INFOID:000000001666477 С **BEFORE REPLACING 4WAS MAIN CONTROL UNIT** · Record the self-diagnosis results (history). **CAUTION:**

- Never erase the memory (history) of self-diagnosis results when replacing 4WAS main control unit after diagnosis.
- Erase the memory of the self-diagnosis results (record) after printing out or recording all the values of "DATA MONITOR".

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ECU DIAGNOSIS 4WAS FRONT CONTROL UNIT

Reference Value

INFOID:000000001666478

VALUES ON THE DIAGNOSIS TOOL

CONSULT-III MONITOR ITEM

Monitor item		Condition	
	Steering wheel turned right		Approx. 0 – 550 deg
4WAS STR ANG	Straight-ahead		Approx. 0 deg
	Steering wheel turned left		Approx. 0 – –550 deg
	Vehicle stopped		0 km/h (0 MPH)
VEHICLE SPEED	Vehicle running CAUTION: Check air pressure of tire under standard conditions.		Approximately equal to the indication on speedometer (Inside of $\pm 10\%$)
	The steering wheel is	not steered.	Approx. 0 – 1 A
MOTOR CURRENT	The steering wheel is	steering.	Approx. 0 – 60 A
	The steering wheel is	not steered.	Approx. 0 – 1 A
MTR CRNT ESTM	The steering wheel is	steering.	Approx. 0 – 60 A
	Steering wheel turned	to the right (with vehicle stopped).	Approx. 0 – 60 deg
ACTR ROTA ANG	Straight-ahead		Approx. 0 deg
	Steering wheel turned	to the left (with vehicle stopped).	Approx. 0 – –60 deg
LG VOLT	Ignition switch: ON	Engine running (idling)	Approx. 0 – 16 V
THERM TEMP	Engine running (idling)	_40 − 100°C
	Ignition switch: ON	Engine running (idling)	Battery voltage
MOTOR VOLT		Engine stopped.	Battery voltage
	Ignition switch: ON	Engine running (idling)	Battery voltage
IGN VOLT		Engine stopped.	Battery voltage
	Steering wheel turned to the right (with vehicle stopped).		Approx. 0 – 60 deg
ACTR ANG COMM	Straight-ahead		Approx. 0 deg
	Steering wheel turned to the left (with vehicle stopped).		Approx. 0 – –60 deg
	The steering wheel is not steered.		0 deg/s
ACTR ROTA SPD	The steering wheel is steering.		Other than 0 deg/s
DUTY COMMAND	Ignition switch: ON	Engine running (idling)	0 – 100%
LOCK DTY COMM	Ignition switch: ON	Engine running (idling)	0 – 100%
		Engine running (idling)	Approx. 0 – 20 V
MTR U VOLT	Ignition switch: ON	Engine stopped.	0 V
		Engine running (idling)	Approx. 0 – 20 V
MTR V VOLT	Ignition switch: ON	Engine stopped.	0 V
		Engine running (idling)	Approx. 0 – 20 V
MTR W VOLT	Ignition switch: ON Engine stopped.		0 V
ACT TEMP ESTM	Engine running (idling)	−40 − 100°C
MTR PHZ CRNT	The steering wheel is	steering.	Approx. 0 – 20 A
ACTR DEVI ANG	The steering wheel is steering.		Approx. –10 – 10 deg

4WAS FRONT CONTROL UNIT

< ECU DIAGNOSIS >

[WITH 4WAS]

Monitor item	Condition	Value/Status
	Steer the steering wheel leftward slowly. Steer until the steering stops.	Approx. 0 – –60 deg
ACTR ANGL SUB	Steer the steering wheel rightward slowly. Steer until the steering stops.	Approx. 0 – 60 deg
STR ANGL SPD	The steering wheel is not steered.	0 deg/s
	The steering wheel is steering.	Other than 0 deg/s
OVRLD JDG TMG	It displays record of 4WAS system (entire 4WAS system) high load. (It displays time of occurrence before turning ignition switch ON.)	0 – 39
ACT PRTCT TMG	It displays record of 4WAS system (4WAS front actuator) over- heating. (It displays time of occurrence before turning ignition switch ON.)	0 – 39
ECU PRTCT TMG	It displays record of 4WAS system (4WAS front control unit) over- heating. (It displays time of occurrence before turning ignition switch ON.)	0 – 39
DRV TMPO TMG	It displays record of 4WAS system (terminal power supply convert- er of 4WAS front motor) intermittent abnormal. (It displays time of occurrence before turning ignition switch ON.)	0 – 39
MTR PW TMP TM	It displays record of 4WAS system (terminal voltage of 4WAS front motor) intermittent abnormal. (It displays time of occurrence before turning ignition switch ON.)	0 – 39
LOW VOLT TMG	It displays record of 4WAS system (terminal voltage of 4WAS front control unit and 4WAS front actuator) low voltage. (It displays time of occurrence before turning ignition switch ON.)	0 – 39
HIGH VOLT TMG	It displays record of 4WAS system (terminal voltage of 4WAS front control unit and 4WAS front actuator) extreme voltage. (It displays time of occurrence before turning ignition switch ON.)	0 – 39
	4WAS system (the entire 4WAS system) heavy load condition judgment (Condition detected in past and present.)	On
OVRLD JDG FLG	4WAS system (the entire 4WAS system) heavy load condition judgment (Condition not detected in past and present.)*	Off
ACT PRTCT FLG	4WAS front actuator overheat condition judgment (Condition detected in past and present.)	On
	4WAS front actuator overheat condition judgment (Condition not detected in past and present.)*	Off
ECU PRTCT FLG	4WAS front control unit overheat condition judgment (Condition detected in past and present.)	On
	4WAS front control unit overheat condition judgment (Condition not detected in past and present.)*	Off
DRV TMPO FLG	4WAS system (4WAS front motor terminal power supply convert- er) intermittent error. (Condition detected in past and present.)	On
	4WAS system (4WAS front motor terminal power supply convert- er) intermittent error. (Condition not detected in past and present.)*	Off
MTR PW TMP FL	4WAS system (4WAS front motor terminal voltage) intermittent er- ror. (Condition detected in past and present.)	On
INTERVINGE	4WAS system (4WAS front motor terminal voltage) intermittent er- ror. (Condition not detected in past and present.)*	Off

4WAS FRONT CONTROL UNIT

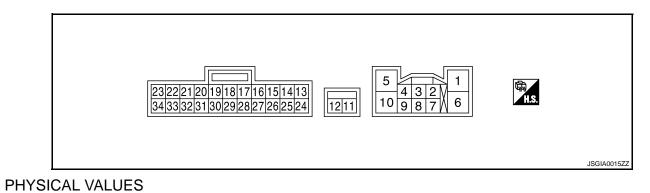
< ECU DIAGNOSIS >

[WITH 4WAS]

Monitor item		Condition	Value/Status
LOW VOLT FLG	terminal voltage) voltag	4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) voltage-dropped condition (Condition detected in past and present.)	
	terminal voltage) voltag	4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) voltage-dropped condition (Condition not detected in past and present.)*	
	terminal voltage) over-v	4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) over-voltage condition (Condition detected in past and present.)	
HIGH VOLT FLG	terminal voltage) over-v	4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) over-voltage condition (Condition not detected in past and present.)*	
MTR SEN U OUT	The steering wheel is s	teering.	$Hi \Leftrightarrow Low$
MTR SEN V OUT	The steering wheel is s	teering.	$Hi \Leftrightarrow Low$
MTR SEN W OUT	The steering wheel is s	teering.	Hi ⇔ Low
	4WAS main control unit fail-safe mode		On
MAIN ECU FAIL	4WAS system is in the normal condition. (When 4WAS main control unit is the normal condition.)		Off
	4WAS main control unit protection function mode		On
M-ECU TMPO FL	4WAS system is in the normal condition. (When 4WAS main control unit is the normal condition.)		Off
	4WAS front lock sole-	Lock released condition	0
LOCK MODE	noid valve (lock struc- ture) condition	Lock condition	1, 2, 3, 4, 5
NEUTRAL OUT	4WAS front actuator misaligned angle adjustment control is con- trolled.		On
	4WAS front actuator misaligned angle adjustment is not controlled.		Off
EX OPERAT	4WAS system enters in the protection function due to the heavy load condition and temporarily abnormal voltage.		On
	4WAS system is in the normal condition.		Off
		MODE" judgment condition	Ok
SLOW MODE	(Steer the steering wheel rightward and leftward slowly. Steer until the turning stops.)		_

*: "Off" is indicated if the self-diagnosis result memory is erased.

TERMINAL LAYOUT



< ECU DIAGNOSIS >

[WITH 4WAS]

Term	inal No.	Wire	Description			
+	-	color	Signal name	Input/ Output	Condition	Value (Approx.)
1	_	G	4WAS front motor V terminal	_	_	_
2	Ground	W	Front wheel angle sensor W terminal voltage	Output	Ignition switch: ON	0 – 5 V
3	_	В	4WAS front lock so- lenoid valve ground		_	_
4	Ground	Y	Front wheel angle sensor U terminal voltage	Output	Ignition switch: ON	0 – 5 V
5	_	BR	4WAS front motor U terminal	_	_	_
6	_	L	4WAS front motor W terminal	_	_	_
7	_	GR	Front wheel angle sensor ground	_	_	-
8	Ground	G/R	Front wheel angle sensor V terminal voltage	Output	Ignition switch: ON	0 – 5 V
			4WAS front lock so-		Ignition switch: ON	Battery voltage
10	Ground	R	lenoid valve power supply	Output	Ignition switch: OFF (Wait 10 min. or more.)	0 V
11	Ground	R	Dower oupply	Input	Ignition switch: ON	Battery voltage
	Ground	ĸ	Power supply	Input	Ignition switch: OFF	Battery voltage
12	Ground	В	4WAS front motor ground	_	Always	0 V
14	—	Y	BUS-L	—	—	_
15	Ground	LG	Ignition switch pow-	Input	Ignition switch: ON	Battery voltage
15	Ground	10	er supply	input	Ignition switch: OFF	0 V
18	Ground	В	Ground	—	Always	0 V
25	_	SB	BUS-H	—	_	_
34	Ground	В	Ground	—	Always	0 V

CAUTION:

When using circuit tester to measure voltage for inspection, never forcibly extend any connector terminals.

Wiring Diagram - 4WAS SYSTEM -

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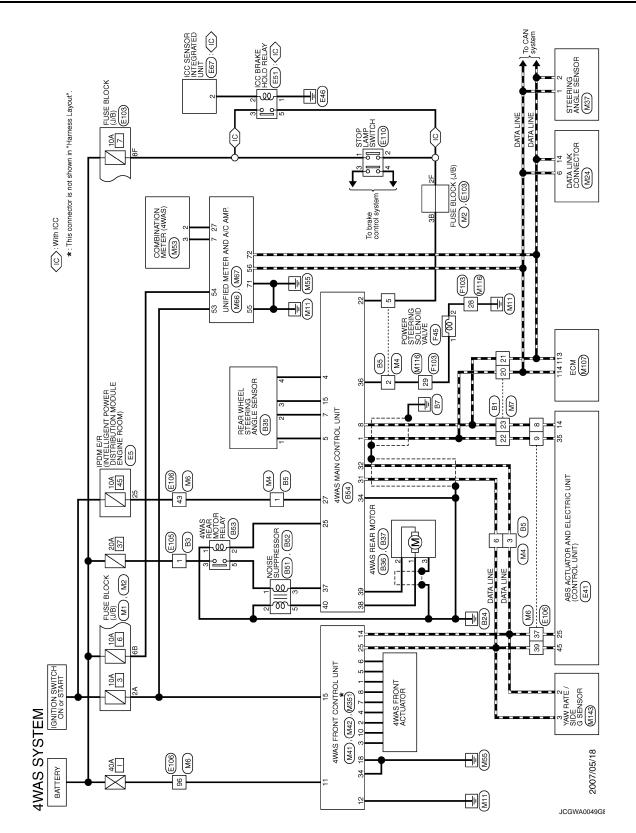
Click here to view the eWD.

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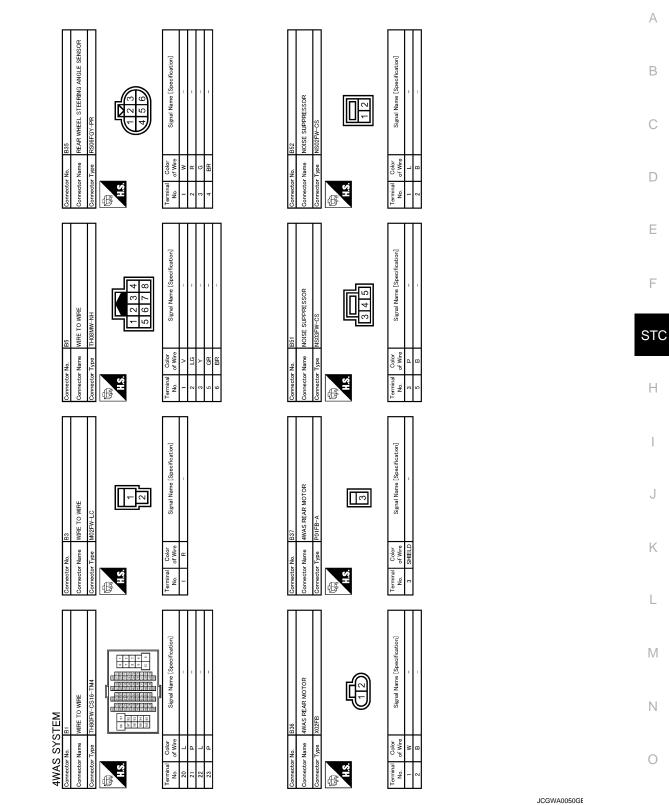
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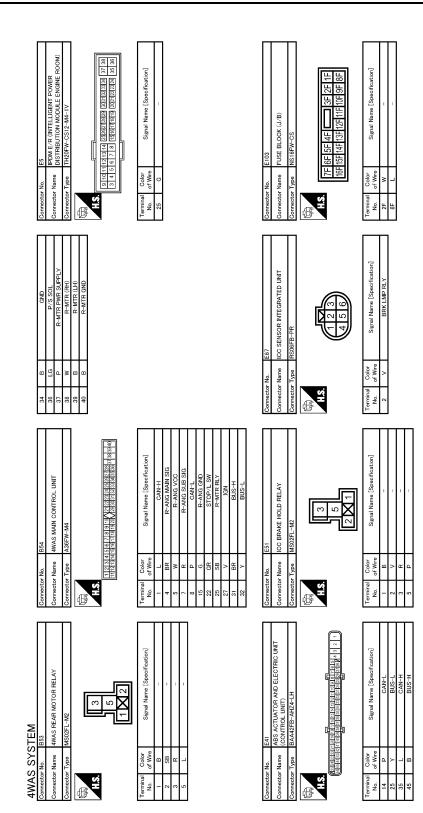


[WITH 4WAS]



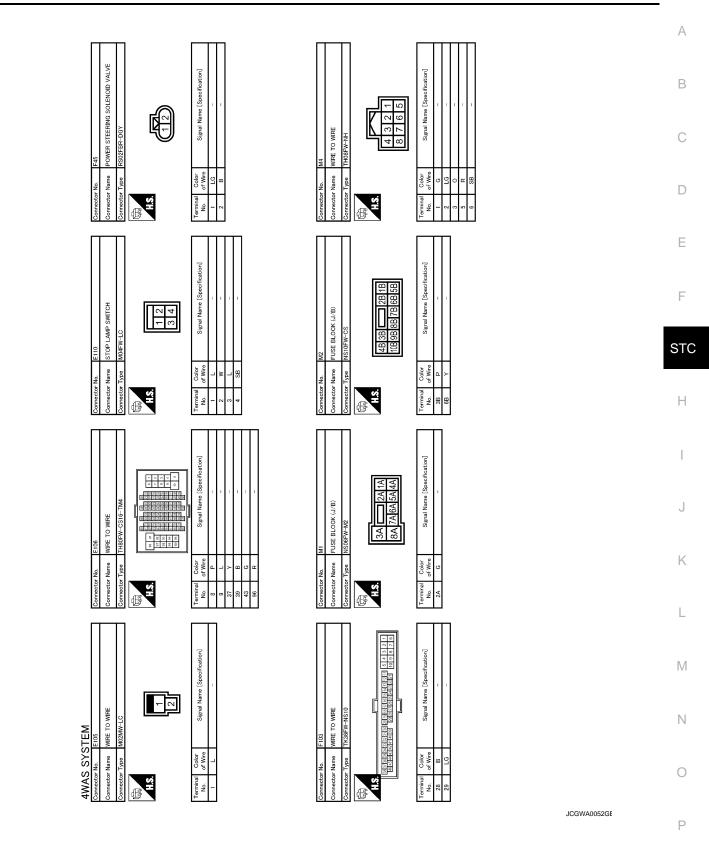
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[WITH 4WAS]

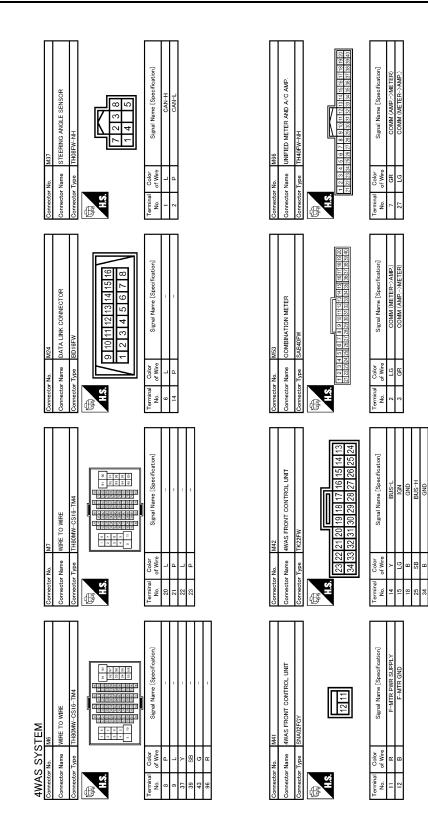


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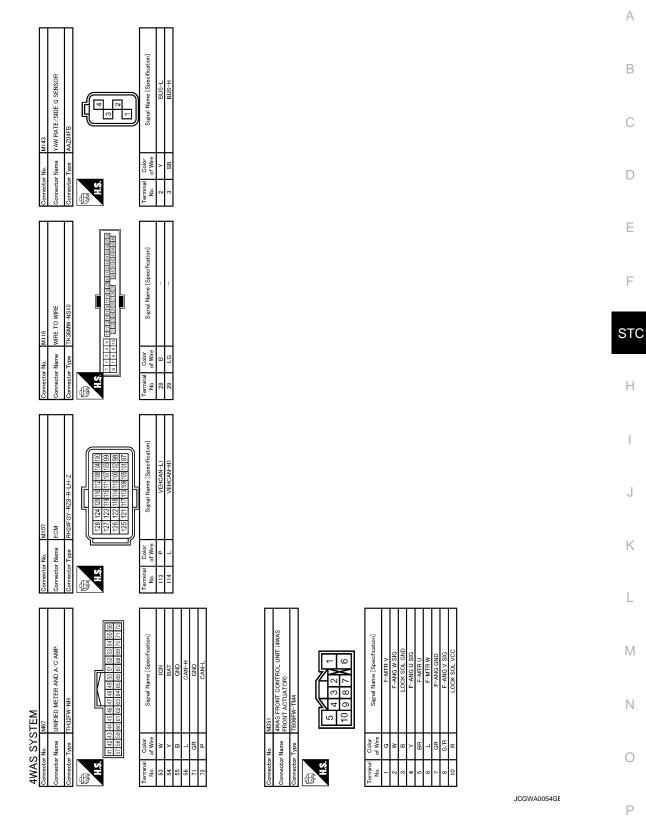
[WITH 4WAS]



[WITH 4WAS]



JCGWA0053GE



Fail Safe

INFOID:000000001666480

4WAS system (front)

- 4WAS system enters in the fail-safe mode (4WAS system is stopped), and 4WAS warning lamp turns ON if an error is detected in 4WAS system (4WAS front control unit and 4WAS main control unit) component part.
- 4WAS system enters in the protection function mode (4WAS system is temporarily stopped) if 4WAS system continues the heavy load condition and the overheat condition.4WAS system reactivates automatically if the

STC-151

< ECU DIAGNOSIS >

heavy load condition and the overheat condition are resolved.4WAS warning lamp continues turning OFF in the protection function mode.

Mode	Warn- ing Iamp	DTC	Detected area (Error area)	Error area and root cause
	Turn- OFF		4WAS front control unit	4WAS front control unit overheat condition
Protec- tion function	Turn- OFF	_	4WAS front actuator	4WAS front actuator overheat condition
	Turn- OFF	_	4WAS front control unit	4WAS front control unit heavy load condition
	Turn- ON	C1621 C1622	4WAS front actuator	4WAS front control unit or 4WAS front motor error is detected.
	Turn- ON	C1627	4WAS front actuator	4WAS front actuator error
	Turn- ON	C1628	Front wheel steering angle sensor	Front wheel steering angle sensor error
	Turn- ON	C1631 C1632	4WAS front control unit	4WAS front control unit or 4WAS front control unit power supply error is detected.
	Turn- OFF	C1633	4WAS front control unit	4WAS front control unit error
	Turn- ON	C1651	4WAS front control unit	4WAS front control unit or the ignition power supply error is detected.
	Turn- ON	C1652	4WAS front control unit	4WAS front control unit or 4WAS front motor power supply error is detected.
	Turn- ON	C1654	4WAS front control unit	The main relay power supply inside 4WAS front control unit error is detected.
	Turn- ON	C1655	4WAS front control unit	4WAS front control unit or 4WAS front motor power supply error is detected.
Fail-safe	Turn- ON	C1661	4WAS front lock solenoid valve (lock structure)	4WAS front control unit or 4WAS front lock solenoid valve error is detected.
	Turn- ON	C1667	4WAS front actuator	The inside 4WAS front actuator error is detected.
	Turn- ON	C1668	4WAS front actuator	The inside 4WAS front actuator error is detected.
	Turn- ON	C1669	4WAS front actuator	The power steering oil pressure or the inside 4WAS front actuator error is detected.
	Turn- ON	C1671	4WAS front actuator	4WAS front actuator adjustment is not performed.
	Turn- ON	C1672	4WAS main actuator	4WAS front actuator adjustment is incomplete.
	Turn- ON	C1684 C1685 U1000 U1002 U1010	4WAS communication line*/ 4WAS main control unit/4WAS front control unit	4WAS communication line*/4WAS main control unit/4WAS front control unit error
	Turn- ON	C1686	4WAS main control unit	4WAS main control unit fail-safe mode

*: Communication line between 4WAS front control unit and 4WAS main control unit.

DTC Inspection Priority Chart

INFOID:000000001666481

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

< ECU DIAGNOSIS >

[WITH 4WAS]

Priority	Detected items (DTC)	A
1	 U1000 CANCOMM CIRCUIT* U1002 SYSTEM COMM(CAN)* U1010 CONTROL UNIT(CAN)* 	В
2	C1671 ACT ADJ NOT PRFRM C1672 INCOMP ACTUATR ADJ	
3	C1631 CONTROL UNIT C1632 CONTROL UNIT	C
4	 C1651 IGN POWER SUPPLY C1652 MOTOR POWER SUPPLY C1654 ACTUATOR RELAY C1655 PRE-DRIVER 	D
5	 C1621 ACTUATOR C1622 ACTUATOR C1627 ACTUATOR C1628 ACTUATOR C1661 LOCK SOLENOID C1667 LOCK INSERTION C1668 LOCK HLD GAP DETCT C1669 INCOMP LOCK RELEAS 	F
6	C1684 4WAS MAIN ECU COMM C1685 4WAS MAIN ECU COMM C1686 4WAS MAIN ECU	STO
7	C1633 CONTROL UNIT	Н

*: 4WAS communication line

DTC Index

INFOID:000000001666482

DTC	Items (CONSULT-III screen terms)	Reference
C1621	ACTUATOR	STC-47, "DTC Logic"
C1622	ACTUATOR	STC-47, "DTC Logic"
C1627	ACTUATOR	STC-50, "DTC Logic"
C1628	ACTUATOR	STC-52, "DTC Logic"
C1631	CONTROL UNIT	STC-55, "DTC Logic"
C1632	CONTROL UNIT	STC-55, "DTC Logic"
C1633	CONTROL UNIT	STC-58, "DTC Logic"
C1651	IGN POWER SUPPLY	STC-60, "DTC Logic"
C1652	MOTOR POWER SUPPLY	STC-62, "DTC Logic"
C1654	ACTUATOR RELAY	STC-64, "DTC Logic"
C1655	PRE-DRIVER	STC-66, "DTC Logic"
C1661	LOCK SOLENOID	STC-68, "DTC Logic"
C1667	LOCK INSERTION	STC-70, "DTC Logic"
C1668	LOCK HLD GAP DETCT	STC-72, "DTC Logic"
C1669	INCOMP LOCK RELEAS	STC-73, "DTC Logic"
C1671	ACT ADJ NOT PRFRM	STC-74, "DTC Logic"
C1672	INCOMP ACTUATR ADJ	STC-76, "DTC Logic"
C1684	4WAS MAIN ECU COMM	STC-77, "DTC Logic"
C1685	4WAS MAIN ECU COMM	STC-77, "DTC Logic"
C1686	4WAS MAIN ECU	STC-81, "DTC Logic"
U1000	CAN COMM CIRCUIT	STC-82, "DTC Logic"

< ECU DIAGNOSIS >

[WITH 4WAS]

DTC	Items (CONSULT-III screen terms)	Reference
U1002	SYSTEM COMM(CAN)	STC-82, "DTC Logic"
U1010	CONTROL UNIT (CAN)	STC-86, "DTC Logic"

Reference Value

VALUES ON THE DIAGNOSIS TOOL

CONSULT-III MONITOR ITEM

Monitor item	Condition	Value/Status	
	Vehicle stopped	0 km/h (0 MPH)	С
VHCL SPEED SE	Start the engine. Wait a minute. Drive the vehicle. CAUTION: Check air pressure of tire under standard conditions.	Approximately equal to the indication on speedometer (Inside of $\pm 10\%$)	D
	Steering wheel turned right	Approx. 0 – R550°	
STEERING ANG	Straight-ahead	Approx. 0°	Е
	Steering wheel turned left	Approx. 0 – L550°	
	Engine stopped	0 rpm	
ENGINE SPEED	Engine running (Engine speed: 400 rpm or more)	Approximately equal to the indi- cation on tachometer	F
STR ANGL SPD	The steering wheel is not steered.	0 deg/s	
STR ANGE OF D	The steering wheel is steering.	1 – 3,000 deg/s	ST
POWER STR SOL	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	Approx. 1.10 A	
	Vehicle speed: 100 km/h (62 MPH)	Approx. 0.42 A	Н
	4WAS rear actuator turns right completely	Approx. 4.4 V	
RR ST ANG-MAI	4WAS rear actuator is neutral	Approx. 2.4 V	1
	4WAS rear actuator turns left completely	Approx. 0.4 V	
	4WAS rear actuator turns right completely	Approx. 4.4 V	
RR ST ANG-SUB	4WAS rear actuator is neutral	Approx. 2.6 V	J
	4WAS rear actuator turns left completely	Approx. 0.4 V	
RR ST ANG-VOL	Ignition switch: ON	Approx. 5 V	K
C/U VOLTAGE	Ignition switch: ON	Battery voltage	1.
MOTOR VOLTAGE	Ignition switch: ON	Battery voltage	
MOTOR CURRENT	4WAS rear motor running	0 – 20 A	L
MTR CRNT OPE	4WAS rear actuator neutral condition and vehicle straight-ahead position.	Approx. –2 – 2 A	
	4WAS rear motor running	Approx. –20 – 20 A	M
	4WAS rear actuator turned right	Approx. 0 – 1 deg	
RR ANGLE OPE	4WAS rear actuator is neutral	Approx. 0 deg	Ν
	4WAS rear actuator turned left	Approx. 0 – –1 deg	1.4
	Steering wheel turned to the right (with vehicle stopped).	Approx. 0 – R60°	
FR ANGLE OPE	Straight-ahead	Approx. 0°	0
	Steering wheel turned to the left (with vehicle stopped).	Approx. 0 – L60 $^{\circ}$	
STOP LAMP SW	Brake pedal: Depressed	On	Р
	Brake pedal: Released	Off	F
HICAS RELAY	Ignition switch: ON	On	
FAIL SAFE	Fail-safe condition	On	
	Normal	Off	
WARNING LAMP	4WAS warning lamp: ON	On	
	4WAS warning lamp: OFF	Off	

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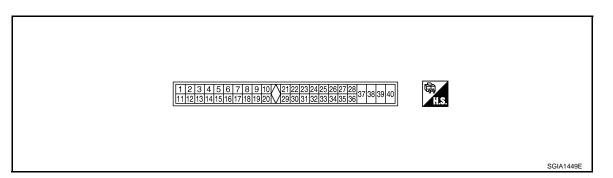
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< ECU DIAGNOSIS >

[WITH 4WAS]

Monitor item	Condition	Value/Status
FRONT ECU FAIL	4WAS front control unit fail-safe mode	On
FRONT ECO FAIL	Normal	Off
FRONT ECU EX	4WAS front control unit enters in the protection function mode	On
	Normal	Off

TERMINAL LAYOUT



PHYSICAL VALUES

Termi	nal No.	Wire	Description			
+	-	color	Signal name	Input/ Output	Condition	Value (Approx.)
1	_	L	CAN-H	—	—	_
			_		4WAS rear actuator assembly turns right completely.	4.4 V
4	Ground	BR	Rear wheel steering angle sensor (main) output voltage	Output	4WAS rear actuator assembly is neu- tral	2.4 V
					4WAS rear actuator assembly turns left completely.	0.4 V
_			Rear wheel steering		Ignition switch: ON	5 V
5	Ground	W	angle sensor power supply	Output	Ignition switch: OFF	0 V
					4WAS rear actuator assembly turns right completely.	4.4 V
7	7 Ground	R	Rear wheel steering angle sensor (sub) output voltage	Output	4WAS rear actuator assembly is neu- tral	2.6 V
			output to age		4WAS rear actuator assembly turns left completely.	0.4 V
8	_	Р	CAN-L	—	—	—
15	Ground	G	Rear wheel steering angle sensor ground	_	Always	0 V
22	Ground	GR	Stop lamp switch	Input	Brake pedal: Depressed	Battery voltage
22	Gibunu	GI	Stop lamp switch	mput	Brake pedal: Released	0 V
25	Ground	SB	4WAS rear motor	Input	Ignition switch: ON	Battery voltage
25	Ciouna	00	relay	mput	Ignition switch: OFF	0 V
27	Ground	V	Ignition switch	Input	Ignition switch: ON	Battery voltage
21	Ground	v	Ignition Switch	input	Ignition switch: OFF	0 V
31	_	BR	4WAS communica- tion-H	_	_	_
32	_	Y	4WAS communica- tion-L	_	_	_

< ECU DIAGNOSIS >

[WITH 4WAS]

Termi	nal No.	Wire	Description					
+	-	color	Signal name	Input/ Output	Condition	Value (Approx.)		
34	Ground	В	Ground	—	Always	0 V		
36	Ground	LG	Power steering so- lenoid valve	Output	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	4.4 – 6.6 V		
					Vehicle speed: 100 km/h (62 MPH)	2.4 – 3.6 V		
37	Ground	Р	4WAS rear motor	loput	Ignition switch: ON	Battery voltage		
57	Ground	P	power supply	power supply	power supply	Input	Ignition switch: OFF	0 V
38	8 Ground	W	4WAS rear motor	Output	While 4WAS rear motor activates rightward	Battery voltage		
30	Ground	vv	output voltage (right)	Output	While 4WAS rear motor activates left- ward	0 V		
39	Ground	В	4WAS rear motor	Outout	While 4WAS rear motor activates rightward	0 V		
39	Ground	D	output voltage (left)	Output	While 4WAS rear motor activates left- ward	Battery voltage		
40	Ground	В	4WAS rear motor ground	_	Always	0 V		

CAUTION:

When using circuit tester to measure voltage for inspection, never forcibly extend any connector terminals.

Wiring Diagram - 4WAS SYSTEM -

Click here to view the eWD.

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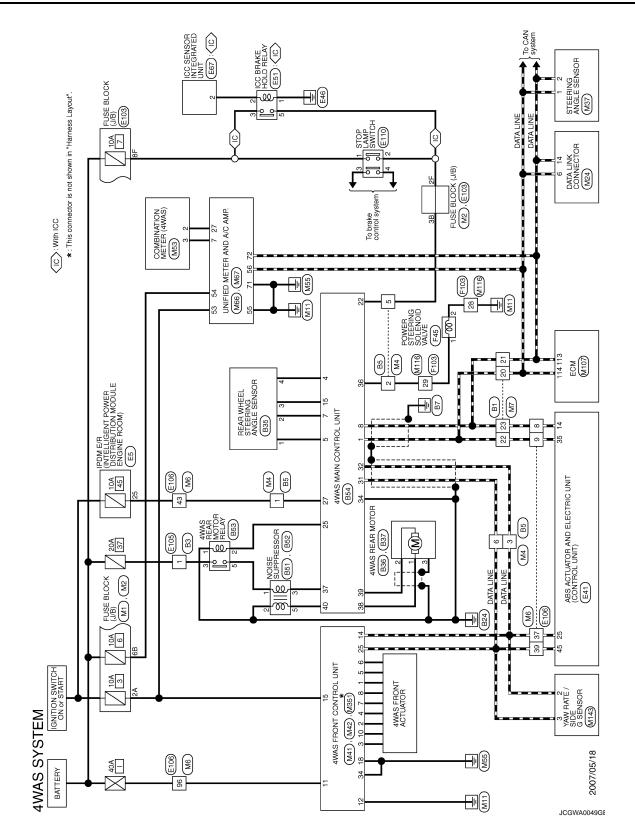
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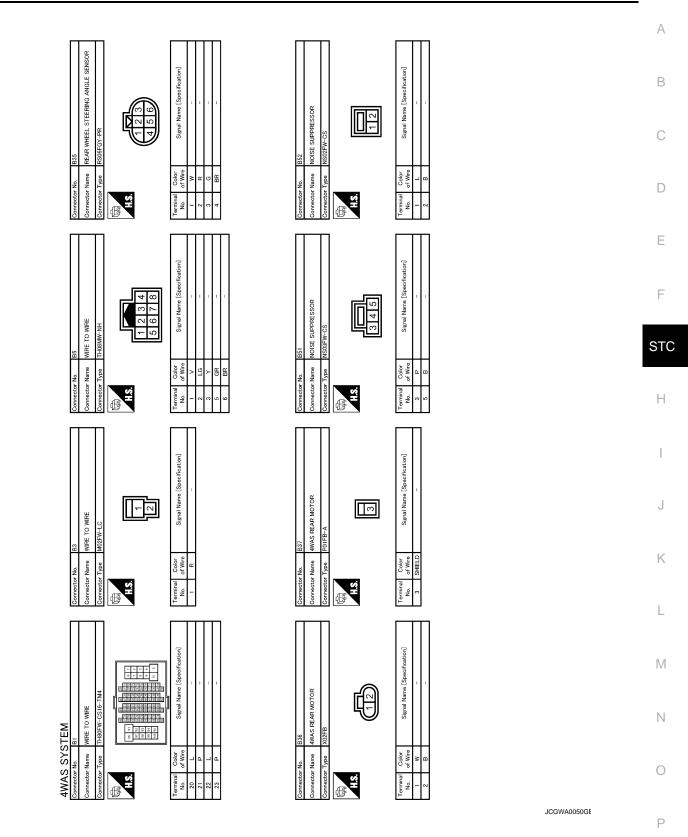
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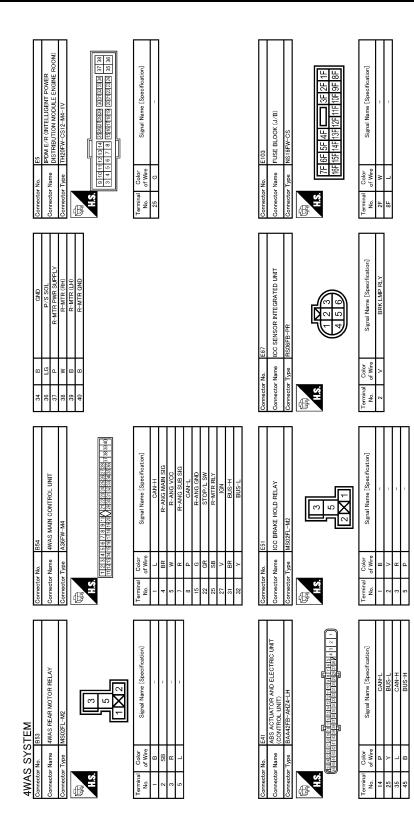


[WITH 4WAS]



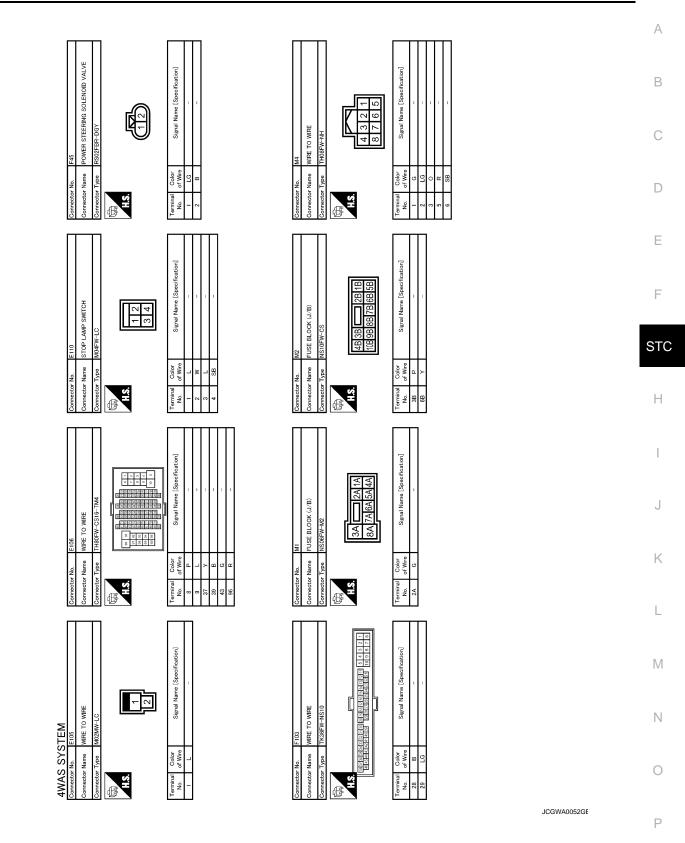
Revision: 2007 June

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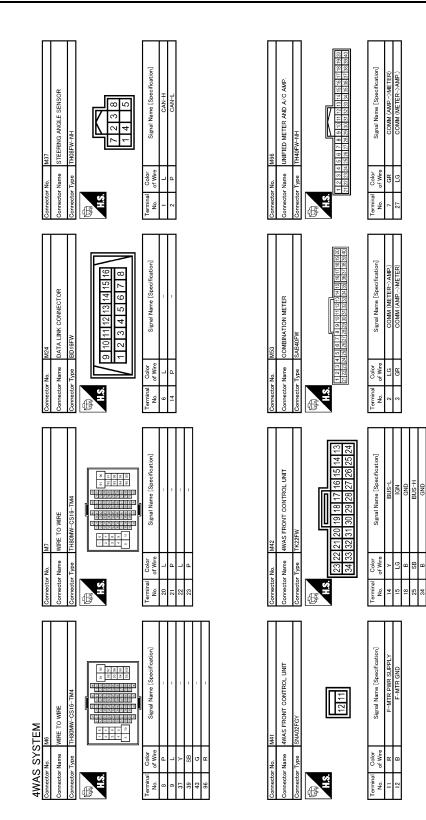


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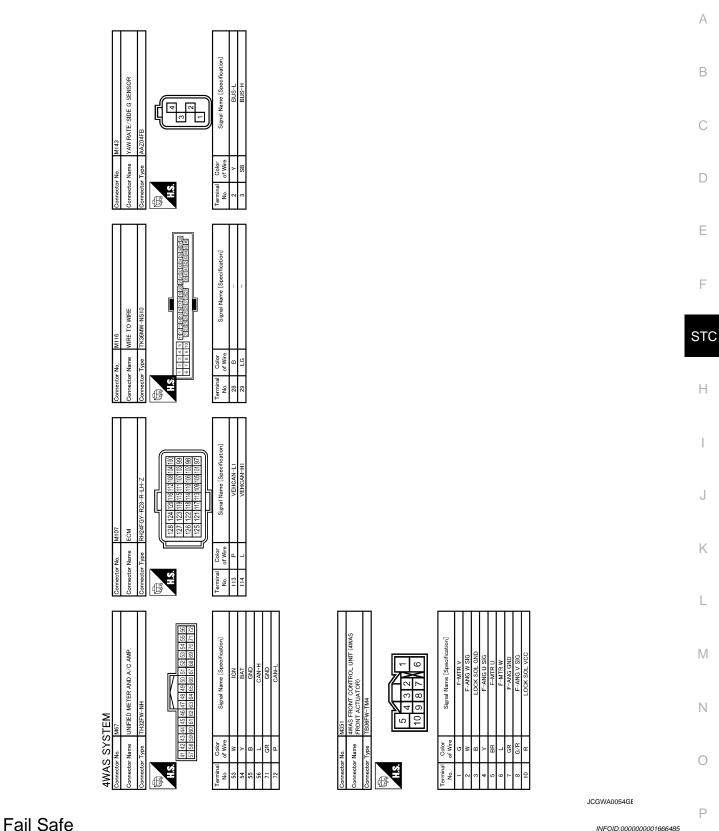
[WITH 4WAS]



[WITH 4WAS]



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INFOID:000000001666485

4WAS system (Main)

- 4WAS system enters in the fail-safe mode (4WAS system stopped) and 4WAS warning lamp turns ON if an error is detected in 4WAS system (4WAS main control unit) component part.
- · 4WAS system enters in the protection function mode (4WAS system temporarily stopped) if 4WAS system continues the heavy load condition or the sensor self-check condition. (4WAS system reactivates automati-

< ECU DIAGNOSIS >

cally if the heavy load condition and the self-check condition are resolved.) 4WAS warning lamp stays OFF in the protection function mode.

Mode	Warn- ing Iamp	DTC	Detected area (Error area)	Error area and root cause
	Turn- ON	C1900 C1901 C1905 C1906 C1907 C1908 C1922 C1925 C1925 C1927 C1928 C1933	4WAS main control unit	4WAS main control unit error
	Turn- ON	C1902 C1903 C1904 C1910 C1913	4WAS rear motor	4WAS rear motor error
	Turn- ON	C1909	4WAS main control unit	4WAS main control unit
	Turn- ON	C1911 C1912	4WAS rear motor	4WAS rear motor power supply error
	Turn- ON	C1914	Rear wheel steering sensor	Rear wheel steering sensor power supply error
	Turn- ON	C1915 C1916	Rear wheel steering sensor	Rear wheel steering sensor output voltage error
Fail-safe	Turn- OFF	C1917	Rear wheel steering sensor	Rear wheel steering sensor (main and sub) output signal value error signal
	Turn- ON	C1918	Rear wheel steering sensor	Rear wheel steering sensor (main and sub) output signal error
	Turn- ON	C1919	ABS actuator and electric unit (control unit)	Vehicle speed signal error
	Turn- ON	C1920 C1923 C1924	Steering angle sensor	Steering angle sensor input signal error
	Turn- ON	C1921	ECM	Engine speed signal error
	Turn- ON	C1926	Steering angle sensor	Steering angle sensor error
	Turn- ON	C1930	4WAS front control unit	4WAS front control unit fail-safe mode
	Turn- ON	C1931	4WAS communication line*/ 4WAS front control unit/4WAS main control unit	4WAS communication line*/4WAS front control unit/4WAS main control unit error
	Turn- ON	C1932	Steering angle sensor	Steering angle sensor input signal error
	Turn- ON	U1000	CAN communication line*	CAN communication error
	Turn- ON	U1010	CAN communication line*/ 4WAS main control unit/ECM/ ABS actuator and electric unit (control unit)	CAN communication line/4WAS main control unit/ECM/ABS actua- tor and electric unit (control unit) error

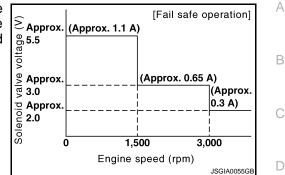
*: Communication line between 4WAS front control unit and 4WAS main control unit.

< ECU DIAGNOSIS >

[WITH 4WAS]

EPS system

• EPS system (4WAS main control unit) enters the fail-safe mode (that allows the steering force to be controlled without impairing the drive ability) if the input from each sensor is not within the specified range. Then, 4WAS warning lamp turns ON.



Mode	Warn- ing Iamp	DTC	Detected area (Error area)	Error part and root cause	E
Fail-safe	Turn- ON	C1919	ABS actuator and electronic unit (control unit)	Vehicle speed signal error	F

DTC Inspection Priority Chart

INFOID:000000001666486

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

Priority	Detected items (DTC)	
1	U1000 CAN COMM U1010 CONTROL UNIT (CAN)	
2	 C1900 CONTROL UNIT [ABNORMAL1] C1901 CONTROL UNIT [ABNORMAL2] C1905 CONTROL UNIT [ABNORMAL3] C1906 CONTROL UNIT [ABNORMAL5] C1907 CONTROL UNIT [ABNORMAL4] C1908 CONTROL UNIT [ABNORMAL7] C1909 CONTROL UNIT [ABNORMAL6] C1922 CONTROL UNIT [ABNORMAL8] C1925 AD CONVERTER C1927 CONTROL UNIT [ABNORMAL5] C1928 CONTROL UNIT [ABNORMAL9] C1933 CONTROL UNIT 	
3	 C1902 MOTOR OUTPUT [REV CURRENT] C1903 MOTOR OUTPUT [NO CURRENT] C1904 MOTOR OUTPUT [OVERCURRENT] C1910 MOTOR OUTPUT [MOTOR LOCK] C1911 MOTOR VOLTAGE [LOW VOLTEGE] C1912 MOTOR VOLTAGE [BAD OBSTRCT] C1913 MOTOR OUTPUT [ABNORML SIG] C1914 RR ST ANGLE SENSOR [ABNORML VOL] C1915 RR ST ANGLE SENSOR [MAIN SIGNAL] C1916 RR ST ANGLE SENSOR [OFFSET SIG1] C1918 RR ST ANGLE SENSOR [OFFSET SIG2] 	
4	 C1919 VEHICLE SPEED SEN [NO SIGNAL] C1920 STEERING ANGLE SEN [NO SIGNAL] C1921 ENG REV SIGNAL C1923 STEERING ANGLE SEN [NO CHANGE] C1924 STEERING ANGLE SEN [NO NEUT STATE] C1926 STEERING ANGLE SEN C1932 STEERING ANGLE SEN 	
5	C1930 4WAS FRONT ECU C1931 4WAS FRONT ECU COMM	

< ECU DIAGNOSIS >

DTC Index

INFOID:000000001666487

[WITH 4WAS]

DTC	Items (CONSULT-III screen terms)	Reference
C1900	CONTROL UNIT [ABNORMAL1]	STC-87, "DTC Logic"
C1901	CONTROL UNIT [ABNORMAL2]	STC-87, "DTC Logic"
C1902	MOTOR OUTPUT [REV CURRENT]	STC-89, "DTC Logic"
C1903	MOTOR OUTPUT [NO CURRENT]	STC-89, "DTC Logic"
C1904	MOTOR OUTPUT [OVERCURRENT]	STC-89, "DTC Logic"
C1905	CONTROL UNIT [ABNORMAL3]	STC-92, "DTC Logic"
C1906	CONTROL UNIT [ABNORMAL5]	STC-87, "DTC Logic"
C1907	CONTROL UNIT [ABNORMAL4]	STC-87, "DTC Logic"
C1908	CONTROL UNIT [ABNORMAL7]	STC-92, "DTC Logic"
C1909	CONTROL UNIT [ABNORMAL6]	STC-94, "DTC Logic"
C1910	MOTOR OUTPUT [MOTOR LOCK]	STC-89, "DTC Logic"
C1911	MOTOR VOLTAGE [LOW VOLTEGE]	STC-96, "DTC Logic"
C1912	MOTOR VOLTAGE [BAD OBSTRCT]	STC-96, "DTC Logic"
C1913	MOTOR OUTPUT [ABNORML SIG]	STC-89, "DTC Logic"
C1914	RR ST ANGLE SENSOR [ABNORML VOL]	STC-101, "DTC Logic"
C1915	RR ST ANGLE SENSOR [MAIN SIGNAL]	STC-104, "DTC Logic"
C1916	RR ST ANGLE SENSOR [SUB SIGNAL]	STC-104, "DTC Logic"
C1917	RR ST ANGLE SENSOR [OFFSET SIG1]	STC-107, "DTC Logic"
C1918	RR ST ANGLE SENSOR [OFFSET SIG2]	STC-107, "DTC Logic"
C1919	VEHICLE SPEED SEN [NO SIGNAL]	STC-110, "DTC Logic"
C1920	STEERING ANGLE SEN [NO SIGNAL]	STC-112, "DTC Logic"
C1921	ENG REV SIGNAL	STC-115, "DTC Logic"
C1922	CONTROL UNIT [ABNORMAL8]	STC-92, "DTC Logic"
C1923	STEERING ANGLE SEN [NO CHANGE]	STC-117, "DTC Logic"
C1924	STEERING ANGLE SEN [NO NEUT STATE]	STC-120, "DTC Logic"

< ECU DIAGNOSIS >

[WITH 4WAS]

DTC	Items (CONSULT-III screen terms)	Reference	А
C1925	AD CONVERTER	STC-92, "DTC Logic"	
C1926	STEERING ANGLE SEN	STC-123, "DTC Logic"	В
C1927	CONTROL UNIT [ABNORMAL5]	STC-87, "DTC Logic"	D
C1928	CONTROL UNIT [ABNORMAL9]	STC-92, "DTC Logic"	С
C1930	4WAS FRONT ECU	STC-126, "DTC Logic"	
C1931	4WAS FRONT ECU COMM	STC-127, "DTC Logic"	D
C1932	STEERING ANGLE SEN	STC-123, "DTC Logic"	
C1933	CONTROL UNIT	STC-87, "DTC Logic"	
U1000	CAN COMM	STC-131, "DTC Logic"	Ε
U1010	CONTROL UNIT (CAN)	STC-132, "DTC Logic"	

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SYMPTOM DIAGNOSIS 4WAS SYMPTOMS

Symptom Table

INFOID:000000001666488

If 4WAS warning lamp turns ON, perform self-diagnosis

Symptom	Condition	Check item	Reference	
		4WAS system power supply and ground		
4WAS warning lamp does not turn on.		Unified meter and A/C amp.		
(4WAS warning lamp does not turn ON when turning ignition switch ON from OFF)	Ignition switch: ON	CAN communication line	STC-169, "De- scription"	
		Combination meter	<u>oonption</u>	
		4WAS main control unit		
111/AS warning lown doop not turn off		4WAS main control unit self-diagnosis	<u>STC-170, "De-</u>	
4WAS warning lamp does not turn off.	Engine running	4WAS front control unit self-diagnosis	scription"	
		Return to 4WAS front actuator initial po- sition		
	Driving	4WAS system condition		
		Steering system		
Steering wheel miss alignment		Wheel alignment		
(The steering wheel position (center) is in		4WAS front actuator adjustment	STC-171, "De- scription"	
the wrong position at driving)		4WAS system ignition power supply	Scription	
		4WAS system 4WAS front motor power supply		
		4WAS system incomplete lock release		
		4WAS system history inspection		
Steering system vibration and noise		4WAS system protection function mode	STC-173, "De-	
(Vibration or noise occurs in the steering wheel while driving the vehicle.)	Driving	4WAS front actuator control stopped	scription"	
		Vehicle speed signal		
Unbalance steering wheel turning force (torque variation)	Driving	Steering system	<u>STC-174, "De-</u> scription"	
		Power steering solenoid valve	<u></u>	

4WAS WARNING LAMP DOES NOT TURN ON [WITH 4WAS] < SYMPTOM DIAGNOSIS > 4WAS WARNING LAMP DOES NOT TURN ON Description INFOID:000000001666489 • 4WAS warning lamp does not turn ON when turning ignition switch ON from OFF. **Diagnosis** Procedure INFOID:000000001666490 1. CHECK 4WAS SYSTEM POWER SUPPLY AND GROUND CIRCUIT With CONSULT-III Perform the trouble diagnosis of the power supply and ground circuit. Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace the specific malfunctioning part. 2.CHECK 4WAS WARNING LAMP (R)With CONSULT-III Perform the trouble diagnosis of 4WAS warning lamp. Refer to STC-140, "Diagnosis Procedure". Is the inspection result normal? YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection. STC NO >> Repair or replace the specific malfunctioning part.

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4WAS WARNING LAWF DOLS NOT TORN OFF	
< SYMPTOM DIAGNOSIS >	[WITH 4WAS]
4WAS WARNING LAMP DOES NOT TURN OFF	
Description	INFOID:000000001666491
 4WAS system stops (error) when turning 4WAS warning lamp ON. 	
Diagnosis Procedure	INFOID:000000001666492
1. PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)	
With CONSULT-III Perform 4WAS main control unit self-diagnosis. Is any DTC detected other than "C1930" or "C1931"? YES >> GO TO 2. NO >> GO TO 3. 2.PERFORM TROUBLE DIAGNOSIS (4WAS MAIN CONTROL UNIT)	
 With CONSULT-III Check the error system detected from the self-diagnosis. Perform 4WAS main control unit self-diagnosis again after the inspection. Is any error system detected? YES >> Check the error system. NO >> GO TO 3. PERFORM SELF-DIAGNOSIS (4WAS FRONT CONTROL UNIT) 	
With CONSULT-III Perform 4WAS front control unit self-diagnosis. Is any error system detected?	
YES >> Check the error system. NO >> GO TO 4.	
4.PERFORM SELF-DIAGNOSIS (4WAS MAIN CONTROL UNIT)	
With CONSULT-III Perform 4WAS main control unit self-diagnosis. Is any error system detected? YES >> Check the error system.	

4WAS WARNING LAMP DOES NOT TURN OFF

>> Check that there is no malfunction in each harness connector pin terminal or disconnection. NO

STEERING WHEEL MISS ALIGNMENT

< SYMPTOM DIAGNOSIS > STEERING WHEEL MISS ALIGNMENT

STEERING WHEEL MISS ALIGNMENT	Δ
Description	A
 The steering wheel position (center) is in the wrong position at driving. 4WAS system stops temporarily. NOTE: The steering wheel position (center) is in the wrong position under the following condition. (4WAS system 	В
is in the protection mode. This is normal status.) - When steering frequently - When driving on a rough road	С
 When the assist of power steering is not sufficient When the battery voltage is weak When driving under the status that there is a difference in the steering wheel 	D
Diagnosis Procedure	Ε
1. СНЕСК ЗҮМРТОМ	
Stop the vehicle in the straight-ahead position after driving for a period of time.	F
Does the steering wheel position (center) misalign?	
nomial at present.)	STC
NO $>>$ GO TO 2.	
2.4WAS FRONT ACTUATOR INITIALIZATION	Н
1. Start the engine. CAUTION:	
Stop the vehicle.	1
 Steer 90° leftward slowly. Steer 90° rightward and return the steering wheel to the straight-ahead position. Repeat the above 10 times. 	1
3. Stop the vehicle in the straight-ahead position after driving for a period of time.	
Does the steering wheel position (center) misalign?	J
 YES >> INSPECTION END (Entered in 4WAS system protection function mode in past. 4WAS system is normal at present.) NO >> GO TO 3. 	K
3.4WAS SYSTEM CONDITION	
With CONSULT-III Start the engine.	L
CAUTION:	
Stop the vehicle. 2. Check "EX OPERAT" item on "DATA MONITOR" of 4WAS front control unit.	M
Does the item on "DATA MONITOR" indicate "On"?	
YES >> GO TO 7. NO >> GO TO 4.	Ν
4. CHECK STEERING SYSTEM	
Check the steering system. Refer to <u>ST-12, "Inspection"</u> .	0
Is the inspection result normal?	0
YES >> GO TO 5.	
NO >> Repair or replace the specific malfunctioning part.	Ρ
5.CHECK WHEEL ALIGNMENT	
Check the wheel alignment. Refer to <u>FSU-7, "Wheel Alignment Inspection"</u> (front side), <u>RSU-6, "Wheel Alignment Inspection"</u> (rear side).	
Is the inspection result normal?	
YES >> GO TO 6.	

NO >> Repair or replace the specific malfunctioning part.

STEERING WHEEL MISS ALIGNMENT

< SYMPTOM DIAGNOSIS >

6.PERFORM 4WAS FRONT ACTUATOR ADJUSTMENT

- 1. Perform 4WAS front actuator adjustment. Refer to <u>STC-28</u>, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)".
- 2. Stop the vehicle in the straight-ahead position after driving for a period of time.

Does the steering wheel position (center) misalign?

YES >> INSPECTION END.

NO >> GO TO 7.

7.CHECK 4WAS SYSTEM IGNITION POWER SUPPLY

Perform the trouble diagnosis of the ignition power supply. Refer to STC-60. "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace the specific malfunctioning part.

8.CHECK 4WAS SYSTEM 4WAS FRONT MOTOR POWER SUPPLY

Perform the trouble diagnosis of 4WAS front motor power supply. Refer to STC-62, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace the specific malfunctioning part.

9.CHECK 4WAS SYSTEM HISTORY

With CONSULT-III

Turn the ignition switch OFF.
 CAUTION:

Wait 30 minutes or more after turning the ignition switch OFF.

2. Start the engine. CAUTION:

Stop the vehicle.

3. Check "EX OPERAT" on 4WAS front control unit "DATA MONITOR".

Monitor item	Condition	Display value
EX OPERAT	4WAS system enters in the protection function due to the heavy load condition and temporarily abnormal voltage.	On

Is the value of DATA MONITOR "On"?

YES >> Replace 4WAS front control unit. Refer to <u>STC-177, "Exploded View"</u>.

 Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-</u>28. "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)".

NO >> INSPECTION END

STEERING SYSTEM VIBRATION AND NOISE

STEERING SYSTEM VIBRATION AND NOISE	
< SYMPTOM DIAGNOSIS >	[WITH 4WAS]
STEERING SYSTEM VIBRATION AND NOISE	
Description	INFOID:000000001666495
 Vibration or noise occurs in the steering wheel while driving the vehicle. NOTE: 	
 Vibration or noise occurs in the steering wheel in the following conditions. (4WAS syste tion.) 	m is not malfunc-
 4WAS system starts and ends (when the engine speed is ON⇔OFF). System protection mode When steering frequently 	
 When driving on a rough road When the assist of power steering is not sufficient When the battery voltage is weak 	
Diagnosis Procedure	INFOID:000000001666496
1.CHECK 4WAS SYSTEM	
With CONSULT-III Start the engine. CAUTION:	
 Stop the vehicle. 2. Check "OVRLD JDG FLG", "ACT PRTCT FLG", "ECU PRTCT FLG", "LOW VOLT FL FLG", "EX OPERAT" items on "DATA MONITOR" of 4WAS front control unit. 	G", "HIGH VOLT
Does all items on "DATA MONITOR" indicate "Off"?	
YES >> INSPECTION END (Vibration and sound occurs in 4WAS system protection fur is normal.)	ction mode. This
NO $>>$ GO TO 2.	
2.STOP 4WAS FRONT ACTUATOR CONTROL	
 Turn the ignition switch OFF. Disconnect 4WAS front actuator harness connector. CAUTION: 	
Disconnect 4WAS front actuator harness connector 10 minutes after turning the	ignition switch
OFF.3. Drive the vehicle for a period of time. Check the symptom.	
CAUTION: Erase the self-diagnosis memory after the inspection is completed to detect 4W, unit DTC "C1661". [Erase the self diagnosis memory of 4WAS main control unit, A electric unit (control unit) and ICC sensor integrated simultaneously.]	
Does symptom not occur?	
 YES >> Replace 4WAS front actuator. Refer to <u>STC-179, "Removal and Installation"</u>. NO >> Perform the symptom diagnosis for the steering system. Refer to <u>ST-3, "NVH</u> <u>Chart"</u>. 	Troubleshooting

Ρ

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION) < SYMPTOM DIAGNOSIS > [WITH 4WAS]

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIA-TION)

Description

INFOID:000000001666497

- The steering force does not change smoothly according to the vehicle speed.
- The steering force is heavy when steering.
- The steering force is light when driving at high speed.

Diagnosis Procedure

INFOID:000000001666498

1.CHECK 4WAS SYSTEM VEHICLE SPEED SIGNAL

Perform the trouble diagnosis of the vehicle speed signal. Refer to <u>STC-110, "Diagnosis Procedure"</u>. Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the specific malfunctioning part.

2.CHECK STEERING SYSTEM

Check the steering system. Refer to ST-12, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the specific malfunctioning part.

3.CHECK 4WAS SYSTEM POWER STEERING SOLENOID VALVE

Perform the trouble diagnosis of the power steering solenoid valve. Refer to <u>STC-138, "Diagnosis Procedure"</u>. Is the inspection result normal?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.

NO >> Repair or replace the specific malfunctioning part.

< PRECAUTION > PRECAUTION PRECAUTIONS

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

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

WARNING:

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

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

NOTE:

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

This vehicle is equipped with a push-button ignition switch and a steering lock unit.

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

OPERATION PROCEDURE

1. Connect both battery cables. **NOTE:**

Supply power using jumper cables if battery is discharged.

- 2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
- 3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
- 4. Perform the necessary repair operation.
- 5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
- 6. Perform self-diagnosis check of all control units using CONSULT-III.

Precautions for Removal and Installation of 4WAS Components

- Set the vehicle to the straight-ahead position when checking 4WAS and removing each component.
- Remove the battery terminal 10 minutes after turning the ignition switch OFF from ON and perform the removal of each component when removing the 4WAS front control unit.

STC-175

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PRECAUTIONS

< PRECAUTION >

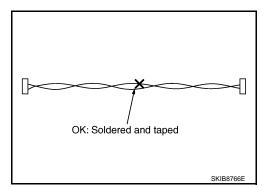
- Perform the neutral position adjustment for the steering angle sensor after the replacement of steering angle sensor. Refer to <u>BRC-8</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special <u>Repair Requirement</u>".
- Refer to <u>STC-27, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Description"</u> for the replacement of 4WAS front control unit.
- Refer to <u>STC-27, "4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Description"</u> for the replacement of 4WAS front actuator.

Precautions for Harness Repair

4WAS COMMUNICATION LINE

• Solder the repaired area and wrap tape around the soldered area. **NOTE:**

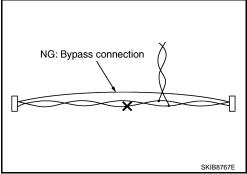
A fray of twisted lines must be within 110 mm (4.33 in).



• Bypass connection is never allowed at the repaired area. **NOTE:**

Bypass connection may cause 4WAS communication error as spliced wires that are separate from the main line or twisted lines lose noise immunity.

• Replace the applicable harness as an assembly if error is detected on the shield lines of 4WAS communication line.



INFOID:000000001666502

[WITH 4WAS]

ON-VEHICLE REPAIR 4WAS FRONT CONTROL UNIT

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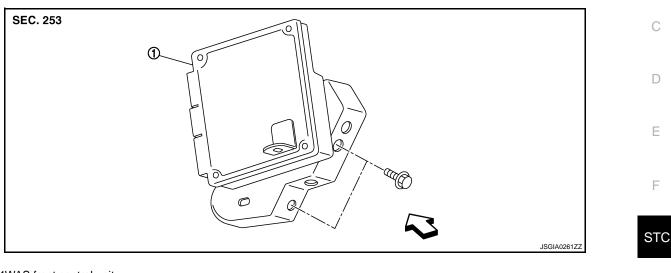
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1. 4WAS front control unit

C:Vehicle front Refer to GI-4, "Components" for symbols in the figure.

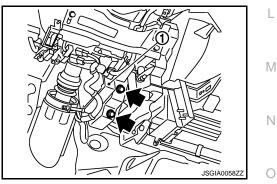
Removal and Installation

REMOVAL

- 1. Turn the ignition switch OFF.
- Remove the instrument driver lower panel. Refer to IP-11, "Exploded View". 2.
- 3. Disconnect 4WAS front control unit connectors. **CAUTION:**

Disconnect 4WAS front control unit connectors 10 minutes after turning the ignition switch OFF.

- 4. Remove the bolts of 4WAS front control unit.
- 5. Remove the 4WAS front control unit (1).



INSTALLATION

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

 Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to <u>STC-28, "4WAS</u> Ρ FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT : Special Repair Requirement (Pattern 3)".

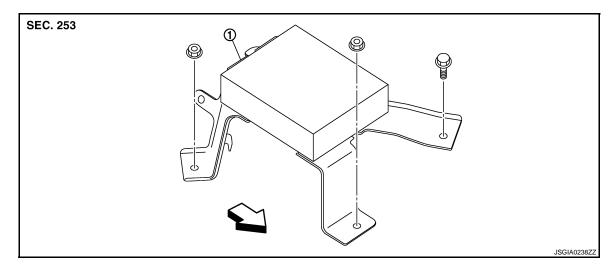
< ON-VEHICLE REPAIR >

4WAS MAIN CONTROL UNIT

Exploded View

INFOID:000000001666505

[WITH 4WAS]



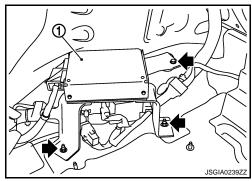
1. 4WAS main control unit

C:Vehicle front Refer to <u>GI-4, "Components"</u> for symbols in the figure.

Removal and Installation

INFOID:000000001666506

- 1. Turn the ignition switch OFF.
- 2. Remove the rear wheel house finisher. Refer to INT-27, "Exploded View".
- 3. Disconnect 4WAS main control unit connectors, 4WAS rear motor relay connector and noise suppressor connectors.
- 4. Remove the 4WAS main control unit bolt and nuts.
- 5. Remove the 4WAS main control unit (1).



INSTALLATION Install in the reverse order of removal.

4WAS FRONT ACTUATOR ASSEMBLY

<u>< ON-VEHICLE REPAIR > [WITH 4WAS]</u> 4WAS FRONT ACTUATOR ASSEMBLY Removal and Installation Removal and Installation INFOID.00000001666507 A Refer to ST section for installation/removal. Refer to <u>ST-22, "WITH 4WAS : Removal and Installation"</u>. B

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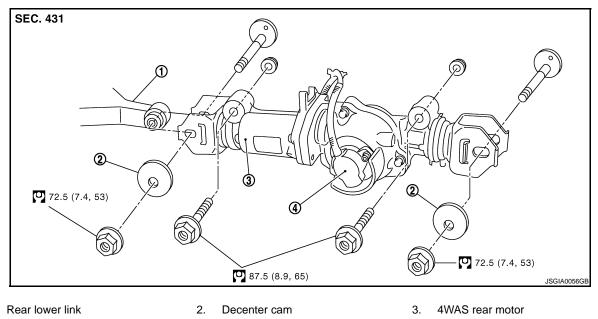
< ON-VEHICLE REPAIR >

4WAS REAR ACTUATOR ASSEMBLY

Exploded View

INFOID:000000001666508

[WITH 4WAS]



4. Rear wheel steering angle sensor

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

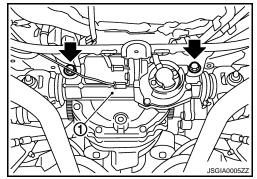
Removal and Installation

INFOID:000000001666509

REMOVAL

1.

- 1. Remove coil spring and lower link. Refer to RSU-8, "Exploded View".
- 2. Disconnect harness connector from 4WAS rear actuator and rear suspension member.
- 3. Remove fixing bolts and nuts of 4WAS rear actuator (1), and then remove 4WAS rear actuator from rear suspension member.



INSTALLATION

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

- When installing 4WAS rear actuator to rear suspension member, check the mounting surfaces of 4WAS rear actuator and rear suspension member for oil, dirt, sand, or other foreign materials.
- Check rear wheel alignment. Refer to RSU-6. "Wheel Alignment Inspection".