

SECTION **STC**

STEERING CONTROL SYSTEM

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PRECAUTION

PRECAUTIONS

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

INFOID:000000011286589

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

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

Always observe the following items for preventing accidental activation.

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

Precautions for Removing Battery Terminal

INFOID:000000011558079

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

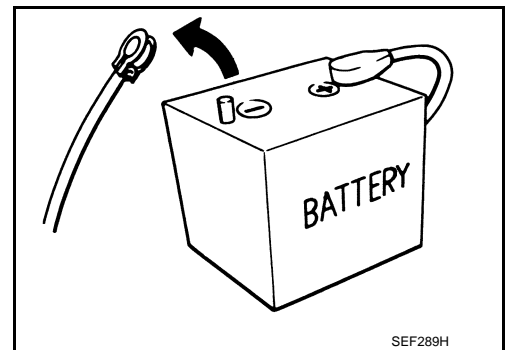
NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.



Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:000000011286590

CAUTION:

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

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PRECAUTIONS

< PRECAUTION >

[VEHICLE SPEED SENSITIVE P/S]

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

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

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

OPERATION PROCEDURE

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

COMPONENT PARTS

< SYSTEM DESCRIPTION >

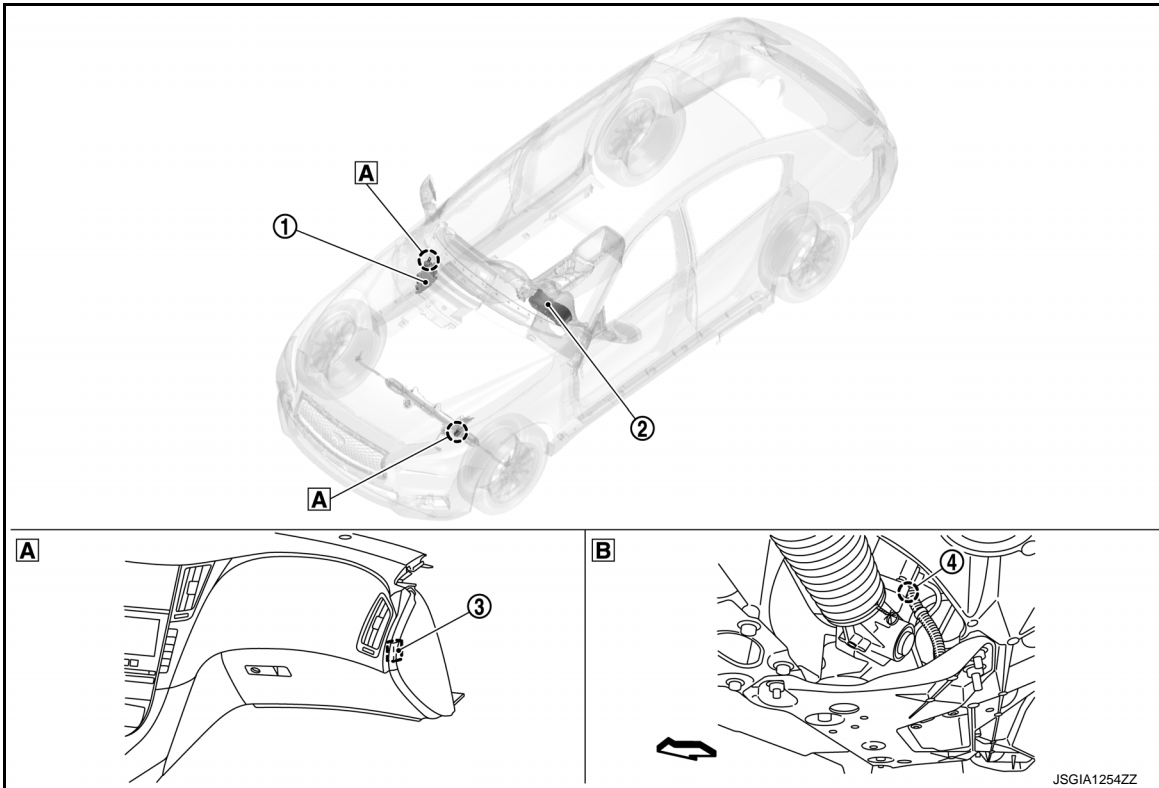
[VEHICLE SPEED SENSITIVE P/S]

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000011286591



A At the back of glove box assembly **B** Steering gear assembly

↔: Vehicle front

No.	Component	Function
①	ECM	<ul style="list-style-type: none"> Transmits the following signal to power steering control unit. - Engine speed signal For detailed installation location, refer to EC-17, "ENGINE CONTROL SYSTEM : Component Parts Location".
②	Combination meter	<ul style="list-style-type: none"> Transmits the following signal to power steering control unit. - Vehicle speed signal For detailed installation location, refer to MWI-7, "METER SYSTEM : Component Parts Location".
③	Power steering control unit	STC-14, "Power Steering Control Unit"
④	Power steering solenoid valve	STC-14, "Power Steering Solenoid Valve"

COMPONENT PARTS

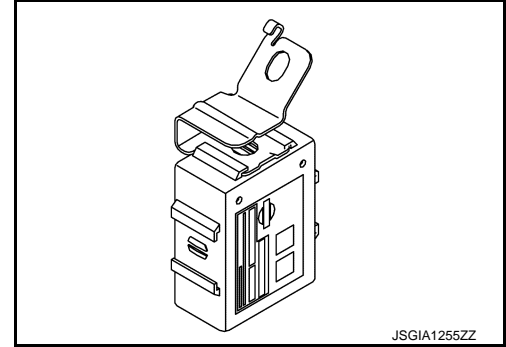
< SYSTEM DESCRIPTION >

[VEHICLE SPEED SENSITIVE P/S]

Power Steering Control Unit

INFOID:000000011286592

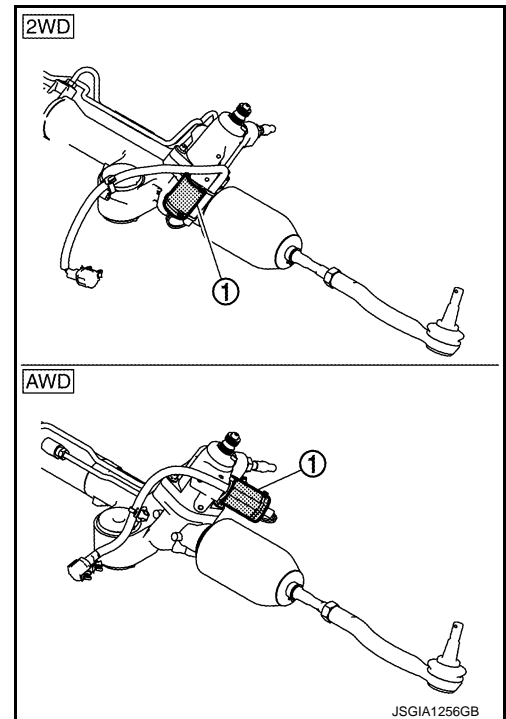
- Signals from various sensors control the driving voltage to power steering solenoid valve.
- Power steering control unit controls the driving voltage to power steering solenoid valve for maintaining the power steering assist force when the fail-safe function is activated. (The engine speed signals control electronically controlled power steering system if any vehicle speed signal error is detected.)



Power Steering Solenoid Valve

INFOID:000000011286593

Power steering solenoid valve ① controls the power steering oil pressure in the gear housing assembly.



SYSTEM

< SYSTEM DESCRIPTION >

[VEHICLE SPEED SENSITIVE P/S]

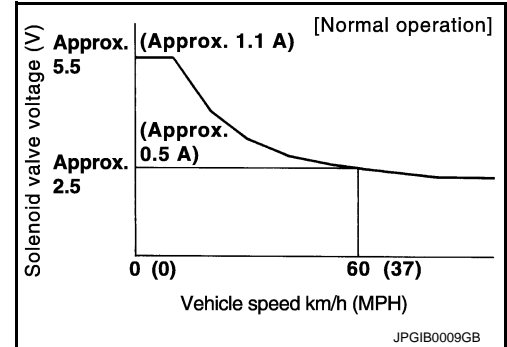
SYSTEM

ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

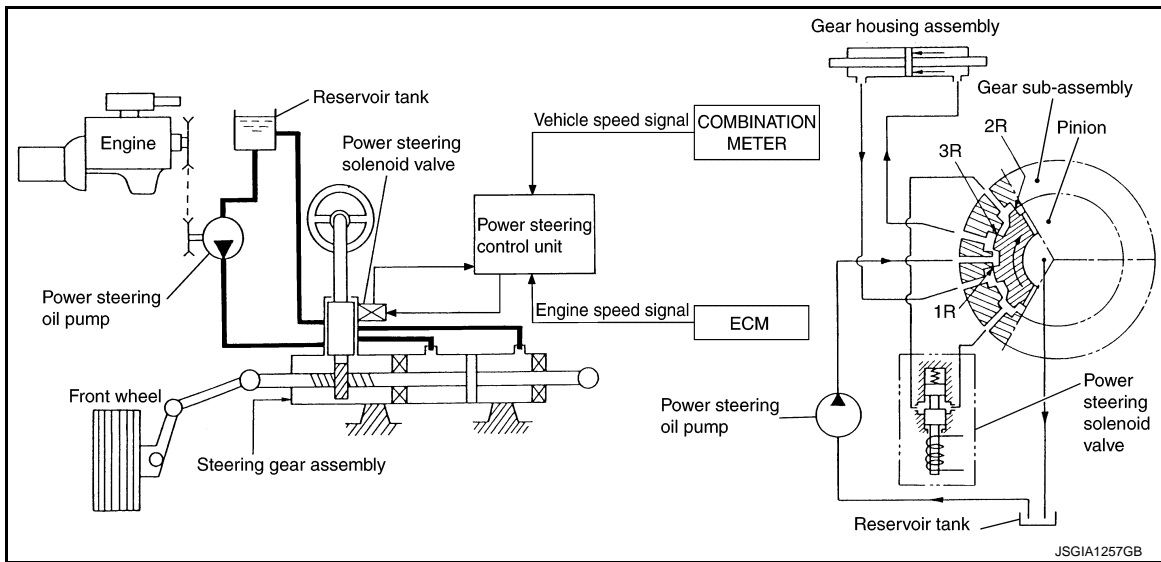
ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM : System Description

INFOID:000000011286594

- Electronically controlled power steering system controls the power steering solenoid valve through the power steering control unit.
- The valve driving voltage to control the power steering solenoid valve varies according to the vehicle speed.



CONTROL DIAGRAM

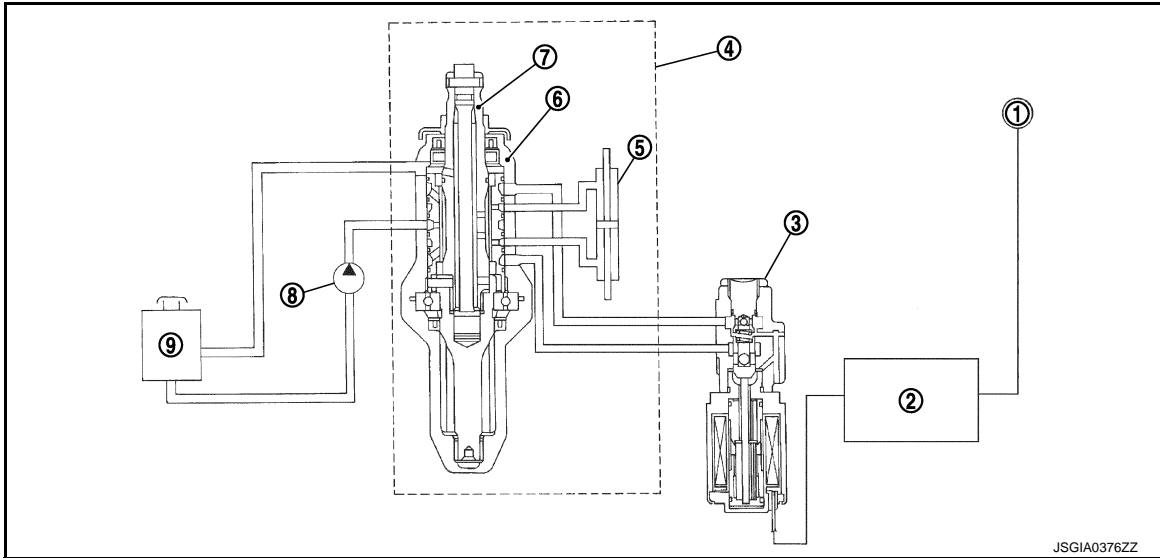


CROSS-SECTIONAL VIEW

SYSTEM

< SYSTEM DESCRIPTION >

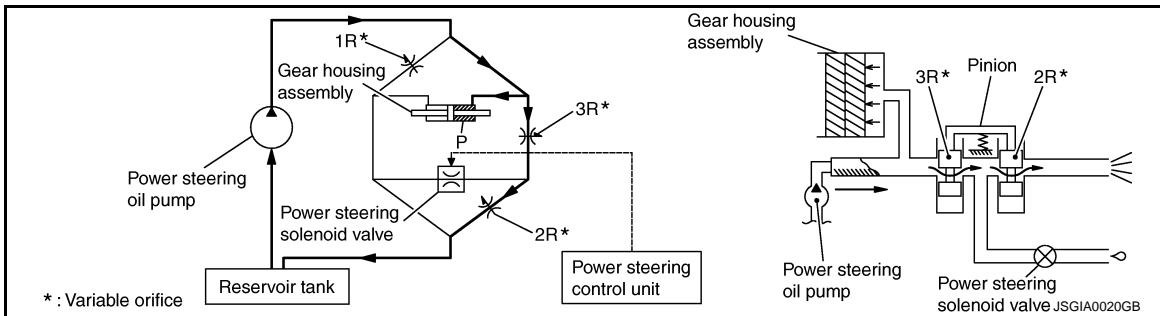
[VEHICLE SPEED SENSITIVE P/S]



- | | | |
|---------------------------|--------------------------------|----------------------------------|
| 1. Combination meter | 2. Power steering control unit | 3. Power steering solenoid valve |
| 4. Steering gear assembly | 5. Gear housing assembly | 6. Gear sub-assembly |
| 7. Pinion | 8. Power steering oil pump | 9. Reservoir tank |

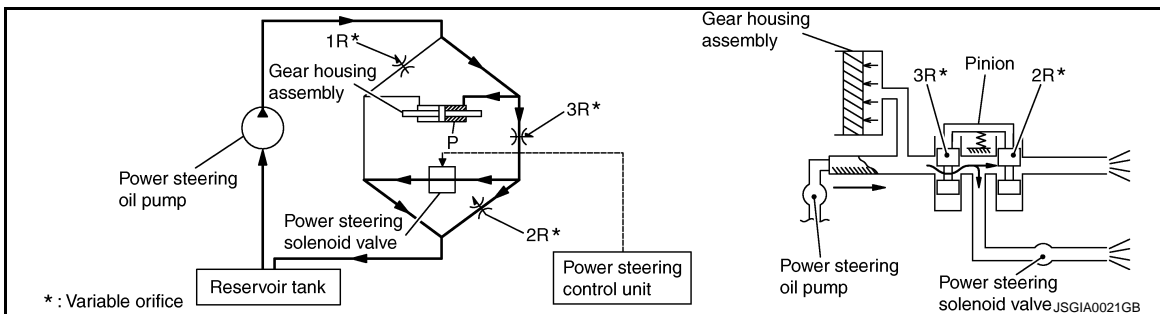
OPERATION PRINCIPLE

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.

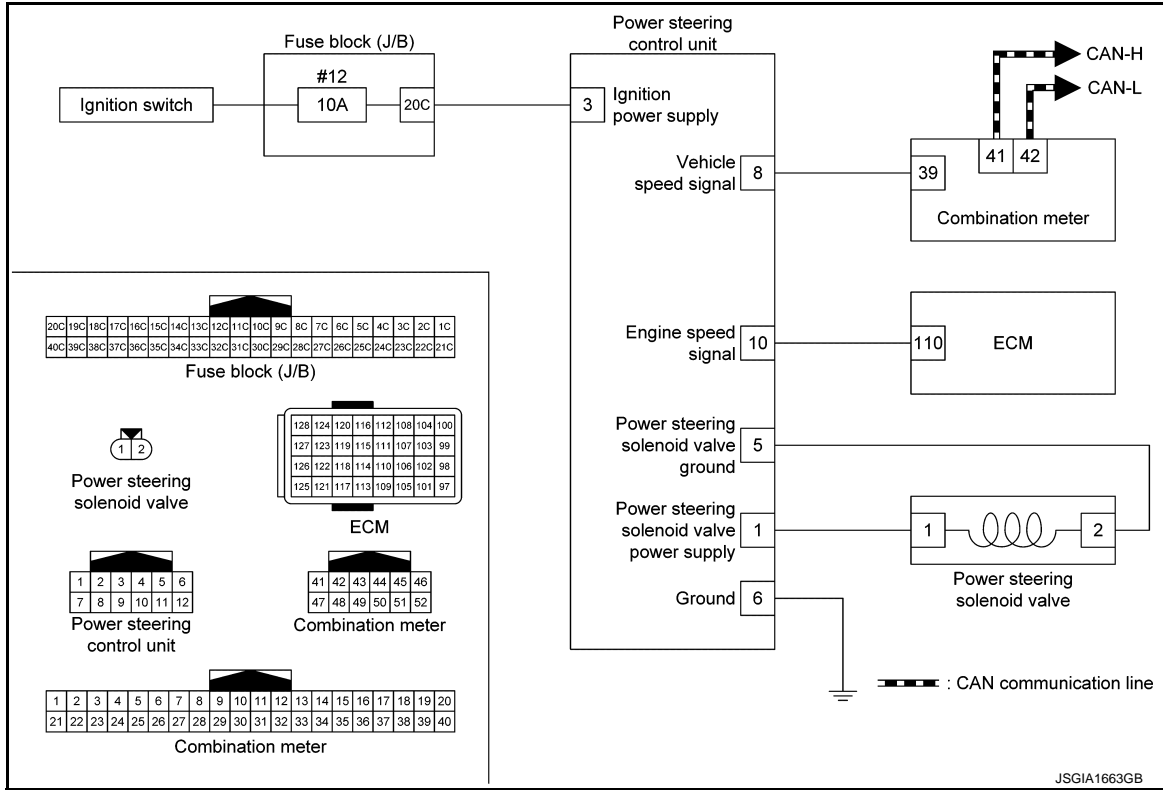
SYSTEM

< SYSTEM DESCRIPTION >

[VEHICLE SPEED SENSITIVE P/S]

ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM : Circuit Diagram

INFOID:000000011286595

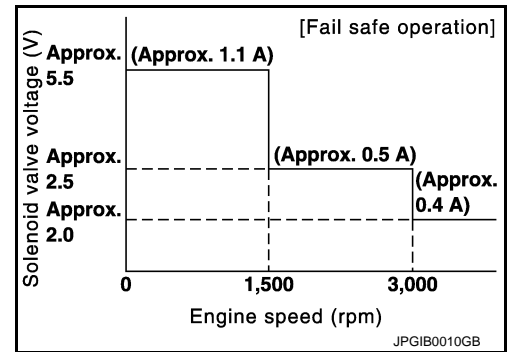


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ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM : Fail-safe

INFOID:000000011286596

- Electronically controlled power steering 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 electronically controlled power steering system (power steering control unit) deviate from the standard range.
- Power steering control unit controls the driving voltage to power steering solenoid valve for maintaining the power steering assist force when the fail-safe function is activated. (The engine speed signals control electronically controlled power steering system if any vehicle speed signal error is detected.)



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Error area and root cause	Cancel condition
Engine speed is 1,500 rpm or more and there is no vehicle speed signal input for over 10 seconds during vehicle travel.	<ul style="list-style-type: none"> • When a vehicle speed signal of 2 km/h (1.2 MPH) or more is inputted. • Key switch is turned OFF to ON.
Vehicle speed signal has abruptly dropped from 30 km/h (19 MPH) or more to 2 km/h (1.2 MPH) or less within 1.4 seconds.	

POWER STEERING CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[VEHICLE SPEED SENSITIVE P/S]

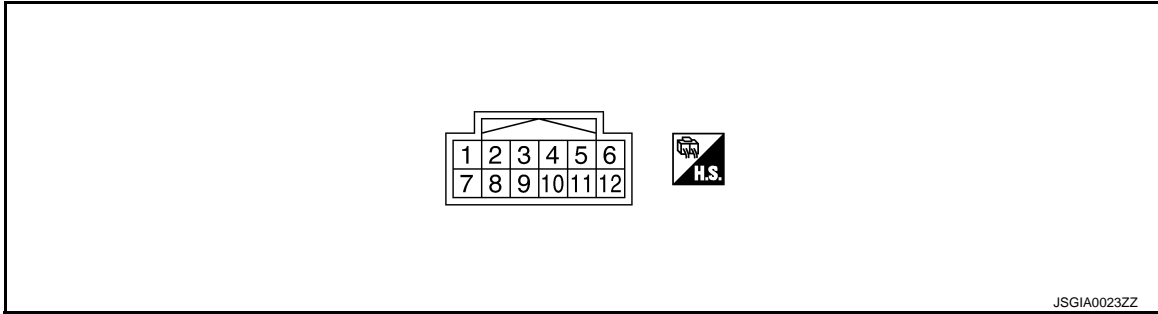
ECU DIAGNOSIS INFORMATION

POWER STEERING CONTROL UNIT

Reference Value

INFOID:000000011286597

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No.		Description		Condition	Value (Approx.)
+	-	Signal name	Input/Output		
1 (LG)	Ground	Power steering solenoid 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)	1.7 – 2.9 V
3 (W)	Ground	Ignition switch power supply	Input	Ignition switch: ON	Battery voltage
				Ignition switch: OFF	0 V
5 (B)	Ground	Power steering solenoid valve ground	—	Always	0 V
6 (B)	Ground	Ground	—	Always	0 V
8 (L)	Ground	Vehicle speed signal	Input	Vehicle speed: 40 km/h (25 MPH) CAUTION: Check air pressure of tire under standard condition.	 JSNIA0015GB
10 (V)	Ground	Engine speed signal	Input	Engine speed: At idle (Warm-up condition)	 10mSec/div 2V/div JMBIA0076GB
				Engine speed: Approx. 2,000 rpm (Warm-up condition)	 10mSec/div 2V/div JMBIA0077GB

POWER STEERING CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[VEHICLE SPEED SENSITIVE P/S]

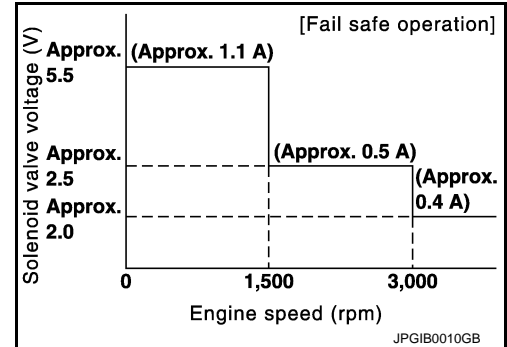
CAUTION:

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

Fail-safe

INFOID:000000011286598

- Electronically controlled power steering 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 electronically controlled power steering system (power steering control unit) deviate from the standard range.
- Power steering control unit controls the driving voltage to power steering solenoid valve for maintaining the power steering assist force when the fail-safe function is activated. (The engine speed signals control electronically controlled power steering system if any vehicle speed signal error is detected.)



Error area and root cause	Cancel condition
Engine speed is 1,500 rpm or more and there is no vehicle speed signal input for over 10 seconds during vehicle travel.	<ul style="list-style-type: none"> • When a vehicle speed signal of 2 km/h (1.2 MPH) or more is inputted. • Key switch is turned OFF to ON.
Vehicle speed signal has abruptly dropped from 30 km/h (19 MPH) or more to 2 km/h (1.2 MPH) or less within 1.4 seconds.	

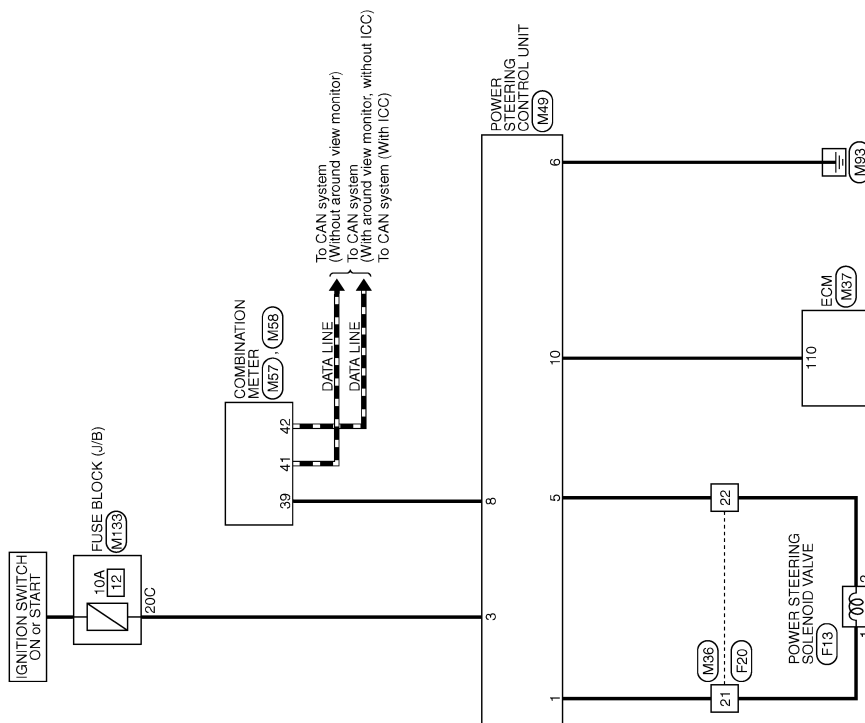
WIRING DIAGRAM

EPS SYSTEM

Wiring Diagram

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POWER STEERING CONTROL SYSTEM



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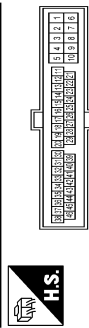
POWER STEERING CONTROL SYSTEM

Connector No.	F13
Connector Name	POWER STEERING SOLENOID VALVE
Connector Type	RS02FBR



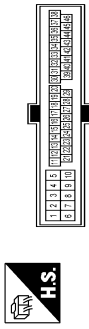
Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	POWER STEERING SOLENOID POWER SUPPLY
2	B	POWER STEERING SOLENOID GROUND

Connector No.	F20
Connector Name	WIRE TO WIRE
Connector Type	TK38FW-NS10



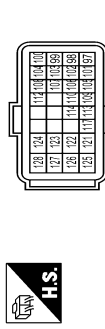
Terminal No.	Color Of Wire	Signal Name [Specification]
1	Y	-
4	R	-
5	B	-
6	W	-
7	G	-
8	BG	-
9	Y	-
10	GR	-
21	LG	-
22	B	-
31	BG	-
32	Y	-
34	BG	-

Connector No.	M36
Connector Name	WIRE TO WIRE
Connector Type	TK38MV-NS10



Terminal No.	Color Of Wire	Signal Name [Specification]
1	Y	-
4	B	-
5	B	-
6	W	-
7	W	-
8	BG	-
9	R	-
10	R	-
21	LG	-
22	B	-
31	BG	-
32	W	-
34	BG	-

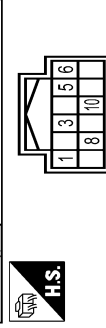
Connector No.	M37
Connector Name	ECM
Connector Type	RH24FGY-RZ8-R-LH-Z



Terminal No.	Color Of Wire	Signal Name [Specification]
97	Y	ACCELERATOR PEDAL POSITION SENSOR 1
98	BR	ACCELERATOR PEDAL POSITION SENSOR 2
99	W	-
100	G	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)
101	SB	ASD/DC STEERING SWITCH
102	LG	EVAP CONTROL SYSTEM PRESSURE SENSOR

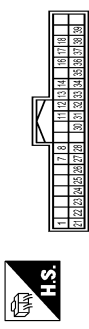
103	L	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 2)
104	R	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
105	L	REFRIGERANT PRESSURE SENSOR
106	P	FUEL TANK TEMPERATURE SENSOR
107	GR	-
108	Y	SENSOR GROUND (ASD/DC STEERING SWITCH)
109	BR	TRANSMISSION RANGE SWITCH
110	V	ENGINE SPEED SIGNAL OUTPUT
112	V	GNDA PDPRES/FTPRES
113	P	CAN COMMUNICATION LINE
114	L	CAN LINK CONNECTOR
117	V	DATA LINK CONNECTOR
121	LG	EVAP CANISTER VENT CONTROL VALVE
122	SB	STOP LAMP SWITCH
123	B	ECM GROUND
124	B	ECM GROUND
125	R	POWER SUPPLY FOR ECM
126	BG	BRAKE PEDAL POSITION SWITCH
127	B	ECM GROUND
128	B	ECM GROUND

Connector No.	M49
Connector Name	POWER STEERING CONTROL UNIT
Connector Type	TH12FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	LG	POWER STEERING SOLENOID POWER SUPPLY
3	W	IGNITION POWER SUPPLY
5	B	POWER STEERING SOLENOID GROUND
6	B	GROUND
8	L	VEHICLE SPEED SIGNAL
10	V	ENGINE SPEED SIGNAL

Connector No.	M57
Connector Name	COMBINATION METER
Connector Type	TH40FW-NH



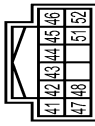
Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GROUND
7	G	SECURITY SIGNAL
8	B	-
11	W	ALTERNATOR SIGNAL
12	G	LED HEADLAMP (RH) WARNING SIGNAL
13	BR	LED HEADLAMP (LH) WARNING SIGNAL
14	V	ACC-POWER SUPPLY
16	V	AIR BAG SIGNAL
17	BR	METER CONTROL SWITCH GROUND
18	SB	TRIP/RESET SIGNAL
21	B	STEERING SWITCH SIGNAL GROUND
22	P	STEERING SWITCH SIGNAL A
23	W/B	STEERING SWITCH SIGNAL B
24	L	WASHER LEVEL SWITCH SIGNAL
25	LG	BRAKE FLUID LEVEL SWITCH SIGNAL
26	V	PARKING BRAKE SWITCH SIGNAL
27	G	PASSENGER SEAT BELT WARNING SIGNAL
28	W	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SEAT)
30	SB	MANUAL MODE SIGNAL
31	G	NON-MANUAL MODE SIGNAL
32	BG	MANUAL MODE SHIFT UP SIGNAL
33	GR	MANUAL MODE SHIFT DOWN SIGNAL
34	BG	PADDLE SHIFTER UP SIGNAL
35	G	PADDLE SHIFTER DOWN SIGNAL
36	V	ILLUMINATION CONTROL SWITCH SIGNAL (+)
37	GR	ILLUMINATION CONTROL SWITCH SIGNAL (-)
38	R	VEHICLE SPEED SIGNAL (8-PULSE)
39	L	VEHICLE SPEED SIGNAL (2-PULSE)

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POWER STEERING CONTROL SYSTEM

Connector No.	M58
Connector Name	COMBINATION METER
Connector Type	TH12FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
41	L	CANH
42	P	CANH
43	B	ILLUMINATION CONTROL SIGNAL
44	Y	FUEL LEVEL SENSOR GROUND
45	W	BATTERY POWER SUPPLY
46	R	IGNITION SIGNAL
47	LG	AV COMMUNICATION SIGNAL (H)
48	SB	AV COMMUNICATION SIGNAL (L)
51	BR	FUEL LEVEL SENSOR SIGNAL GROUND
52	B	



Connector No.	M133
Connector Name	FUSE BLOCK (J/B)
Connector Type	TH10FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
100	V	
110	V	
130	L	
140	Y	
150	R	
160	R	
170	L	
180	BG	- [Without DRPC]
180	P	- [With DRPC]
190	B	

200	W	
210	L	
220	L	
230	L	
250	LG	
260	SB	
270	P	
280	W	
290	W	
300	R	
310	W	
320	R	
330	B	
340	W/B	
350	SB	
360	R	
370	W	
380	SB	
380	V	
30	P	
400	G	
40	P	
50	P	
60	G	
70	G	
80	V	
90	V	

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[VEHICLE SPEED SENSITIVE P/S]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000011286600

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 [ST-28. "Inspection"](#).
2. Check the drive belt tension. Refer to [EM-20. "Checking"](#).
3. Check the power steering gear for damages, cracks and fluid leakage. Refer to [ST-43. "2WD : Inspection and Adjustment"](#) (2WD), [ST-48. "AWD : Inspection"](#) (AWD).
4. Check the relief oil pressure. Refer to [ST-54. "Inspection"](#).

>> GO TO 3.

3. DIAGNOSIS CHART BY SYMPTOM

Perform the diagnosis by symptom.

>> 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.

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VEHICLE SPEED SENSITIVE P/S]

DTC/CIRCUIT DIAGNOSIS

POWER SUPPLY AND GROUND CIRCUIT

Description

INFOID:0000000011286601

Power supply to electronically controlled power steering system.

Diagnosis Procedure

INFOID:0000000011286602

1. CHECK POWER SUPPLY (1)

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

Power steering control unit		—	Voltage (Approx.)
Connector	Terminal		
M49	+	-	0 V
	3	Ground	

4. Turn the ignition switch ON.
CAUTION:
Never start the engine.
5. Check the voltage between power steering control unit harness connector and ground.

Power steering control unit		—	Voltage (Approx.)
Connector	Terminal		
M49	+	-	Battery voltage
	3	Ground	

Is the inspection result normal?

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

2. CHECK POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check 10A fuse (#12).
3. Disconnect fuse block (J/B) harness connector.
4. Check the continuity between power steering control unit harness connector and fuse block (J/B) harness connector.

Power steering control unit		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M49	3	M133	20C	Existed

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

Power steering control unit		—	Continuity
Connector	Terminal		
M49	3	Ground	Not existed

Is the inspection result normal?

- YES >> Perform trouble diagnosis for ignition power supply circuit. Refer to [PG-57, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).
NO >> Repair or replace damaged parts.

3. CHECK GROUND CIRCUIT

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VEHICLE SPEED SENSITIVE P/S]

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

Power steering control unit		—	Continuity
Connector	Terminal		
M49	6	Ground	Existed

Is the inspection result normal?

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

4.CHECK TERMINALS AND HARNESS CONNECTORS

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

Is the inspection result normal?

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

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POWER STEERING SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[VEHICLE SPEED SENSITIVE P/S]

POWER STEERING SOLENOID VALVE

Component Function Check

INFOID:000000011286603

1.CHECK POWER STEERING SOLENOID VALVE OPERATION

Check changes in steering force from a halt condition to high-speed driving.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the power steering solenoid valve. Refer to [STC-26, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000011286604

1.CHECK POWER STEERING SOLENOID VALVE SIGNAL

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

Power steering control unit		—	Condition	Voltage (Approx.)
Connector	Terminal	—		
M49	+	-		
	1	Ground	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	4.4 – 6.6 V
			Vehicle speed: 100 km/h (62 MPH)	1.7 – 2.9 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2.CHECK POWER STEERING SOLENOID VALVE CIRCUIT

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.

Power steering solenoid valve		Power steering control unit		Continuity
Connector	Terminal	Connector	Terminal	
F13	1	M49	1	Existed
	2		5	

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

Power steering control unit		—	Continuity
Connector	Terminal	—	
M49	1	Ground	Not existed
	5		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK POWER STEERING SOLENOID VALVE

Check the power steering solenoid valve. Refer to [STC-27, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Power steering solenoid valve is malfunctioning. Replace gear housing assembly. Refer to [ST-40, "2WD : Removal and Installation"](#) (2WD), [ST-45, "AWD : Removal and Installation"](#) (AWD).

POWER STEERING SOLENOID VALVE

[VEHICLE SPEED SENSITIVE P/S]

< DTC/CIRCUIT DIAGNOSIS >

4. CHECK TERMINALS AND HARNESS CONNECTORS

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000011286605

1. CHECK POWER STEERING SOLENOID VALVE

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

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

4. Check the power steering solenoid valve connector by listening for its operation sound while applying battery voltage to power steering solenoid valve connector terminals.

Power steering solenoid valve		Operation sound
Terminal		
1 (Positive)	2 (Negative)	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Power steering solenoid valve is malfunctioning. Replace housing assembly. Refer to [ST-40, "2WD : Removal and Installation"](#) (2WD), [ST-45, "AWD : Removal and Installation"](#) (AWD).

ENGINE SPEED SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VEHICLE SPEED SENSITIVE P/S]

ENGINE SPEED SIGNAL CIRCUIT

Diagnosis Procedure

INFOID:000000011286606

1. PERFORM ECM SELF-DIAGNOSIS

Ⓜ With CONSULT

Perform self-diagnosis for "ENGINE".

Is any error system detected?

YES >> Check the DTC. Refer to [EC-108. "DTC Index"](#).

NO >> GO TO 2.

2. CHECK ENGINE SPEED SIGNAL CIRCUIT

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

Power steering control unit		ECM		Continuity
Connector	Terminal	Connector	Terminal	
M49	10	M37	110	Existed

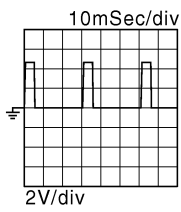
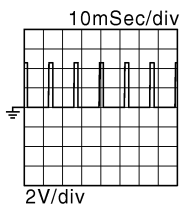
Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

3. CHECK ENGINE SPEED SIGNAL (ECM)

1. Connect ECM harness connectors.
2. Check the signal between ECM harness connector and ground with oscilloscope.

ECM		—	Condition	Value (Approx.)
Connector	Terminal			
M37	110	Ground	Engine speed: At idle (Warm-up condition)	
			Engine speed: Approx. 2,000 rpm (Warm-up condition)	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace ECM. Refer to [EC-153. "Description"](#).

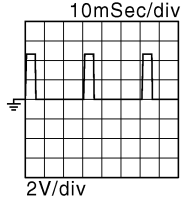
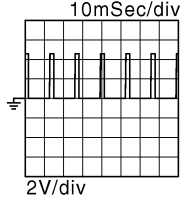
4. CHECK ENGINE SPEED SIGNAL (POWER STEERING CONTROL UNIT)

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

ENGINE SPEED SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VEHICLE SPEED SENSITIVE P/S]

Power steering control unit		—	Condition	Value (Approx.)
Connector	Terminal			
M49	10	Ground	Engine speed: At idle (Warm-up condition)	
			Engine speed: Approx. 2,000 rpm (Warm-up condition)	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace power steering control unit. Refer to [STC-33. "Removal and Installation"](#).

5. CHECK TERMINALS AND HARNESS CONNECTORS

- Check the 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.

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VEHICLE SPEED SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VEHICLE SPEED SENSITIVE P/S]

VEHICLE SPEED SIGNAL CIRCUIT

Diagnosis Procedure

INFOID:000000011286607

1. PERFORM COMBINATION METER SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "METER/M&A".

Is any error system detected?

YES >> Check the DTC. Refer to [MWI-80. "DTC Index"](#).

NO >> GO TO 2.

2. CHECK VEHICLE SPEED SIGNAL CIRCUIT

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

Power steering control unit		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
M49	8	M57	39	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

3. CHECK VEHICLE SPEED SIGNAL (COMBINATION METER)

1. Connect combination meter harness connector.
2. Check the combination meter input/output standard values. Refer to [MWI-70. "Reference Value"](#).

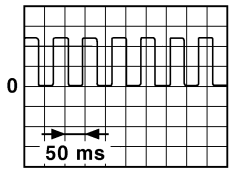
Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace combination meter. Refer to [MWI-126. "Removal and Installation"](#).

4. CHECK VEHICLE SPEED SIGNAL (POWER STEERING CONTROL UNIT)

1. Connect power steering control unit harness connector.
2. Check the signal between power steering control unit harness connector and ground with oscilloscope.

Power steering control unit		—	Condition	Value (Approx.)
Connector	Terminal			
	+	-		
M49	8	Ground	Vehicle speed: 40 km/h (25 MPH) CAUTION: Check the air pressure of tire under standard condition.	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace power steering control unit. Refer to [STC-33. "Removal and Installation"](#).

5. CHECK TERMINALS AND HARNESS CONNECTORS

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

Is the inspection result normal?

VEHICLE SPEED SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VEHICLE SPEED SENSITIVE P/S]

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

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UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

< SYMPTOM DIAGNOSIS >

[VEHICLE SPEED SENSITIVE P/S]

SYMPTOM DIAGNOSIS

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

Description

INFOID:0000000011286608

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

Diagnosis Procedure

INFOID:0000000011286609

1. CHECK SYSTEM FOR POWER SUPPLY AND GROUND

Perform trouble diagnosis for power supply and ground. Refer to [STC-24, "Diagnosis Procedure"](#).

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-30, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

3. CHECK SYSTEM FOR ENGINE SPEED SIGNAL

Perform trouble diagnosis for engine speed signal. Refer to [STC-28, "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 [STC-26, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Perform the symptom diagnosis for the steering system. Refer to [ST-26, "NVH Troubleshooting Chart"](#).
- NO >> Repair or replace damaged parts.

POWER STEERING CONTROL UNIT

< REMOVAL AND INSTALLATION >

[VEHICLE SPEED SENSITIVE P/S]

REMOVAL AND INSTALLATION

POWER STEERING CONTROL UNIT

Removal and Installation

INFOID:000000011286610

REMOVAL

1. Remove glove box. Refer to [JP-13. "Removal and Installation"](#).
2. Disconnect power steering control unit connector.
3. Remove power steering control unit.

INSTALLATION

Install in the reverse order of removal.

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PRECAUTION

PRECAUTIONS

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

INFOID:000000011286611

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

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

Always observe the following items for preventing accidental activation.

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

Precautions for Removing Battery Terminal

INFOID:000000011558080

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

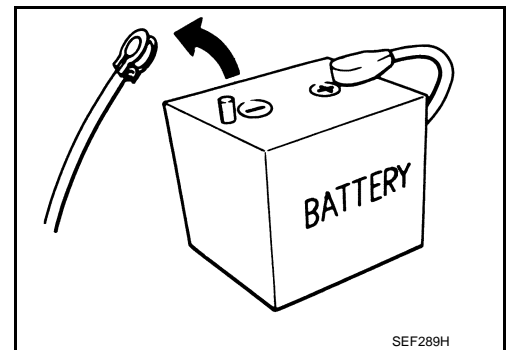
NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.



Precautions for Harness Repair

INFOID:000000011286612

FLEXRAY AND CAN COMMUNICATION LINE

PRECAUTIONS

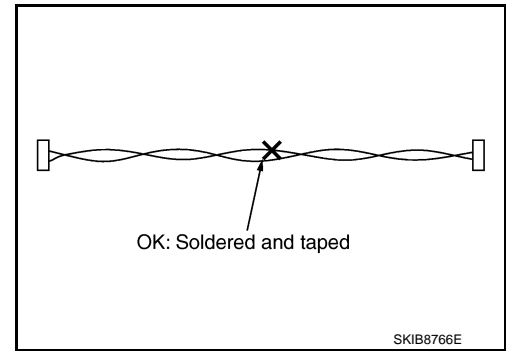
[DIRECT ADAPTIVE STEERING]

< PRECAUTION >

- 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).

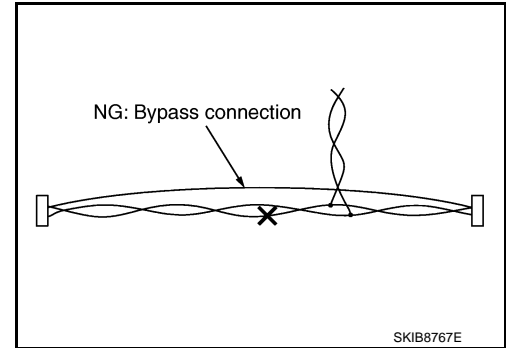


- Bypass connection is never allowed at the repaired area.

NOTE:

Bypass connection may cause FlexRay 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 FlexRay communication line.



Service Notice and Precautions for Direct Adaptive Steering

INFOID:000000011286613

- Set the vehicle to the straight-ahead position when checking direct adaptive steering and removing each component.
- Check the following item when performing the trouble diagnosis.
 - Check if air pressure and size of tires are proper, the specified part is used for the steering wheel is genuine part.
 - Check if the connection of steering column assembly and steering gear assembly is proper (there is not looseness of mounting bolts, damage of rods, and boots or sealants, etc.).
 - Check if the wheel alignment is adjusted properly.
 - Check if there is any damage or modification to suspension or body resulting in increased weight or altered ground clearance.
 - Check if installation conditions of each link and suspension are proper.
 - Check if the battery voltage is proper.
 - Check connection conditions of each connector are proper.
- A machine sound may be heard near the driver's seat when the system is starting. This is an operating sound in normal condition of system and the sound is not.
- Before connecting or disconnecting each component harness connector, turn ignition switch "OFF" and disconnect battery ground cable. Because battery voltage is applied to power steering control module even if ignition switch is turned "OFF".
- When removing the 12V battery negative terminal, initialize is required for operating the direct adaptive steering normally. Refer to [STC-121, "Work Procedure"](#).
- Refer to [STC-122, "Special Repair Requirement"](#) for the replacement of each component.

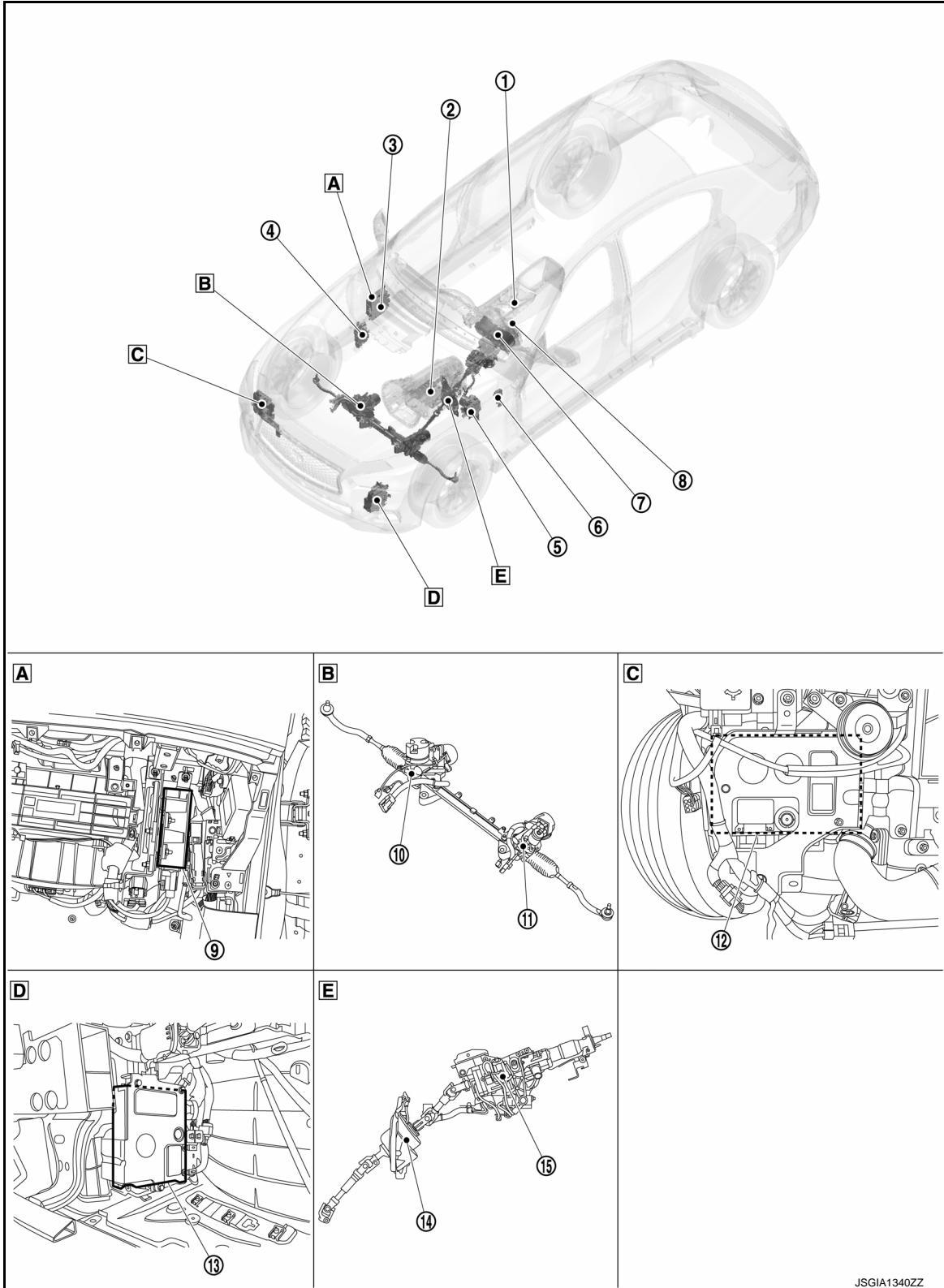
< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:000000011286614



COMPONENT PARTS

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

- A Behind of glove box
 B Steering gear assembly
 C Behind of front bumper (right side)
- D Behind of front bumper (left side)
 E Steering column assembly and steering shaft assembly

No.	Component	Function
①	Drive mode select switch	<ul style="list-style-type: none"> • Drive mode is selectable among PERSONAL, SPORT, and STANDARD by the operating the switch. • Output the status of drive mode to the chassis control module. • For detailed installation location, refer to DMS-3, "Component Parts Location".
②	TCM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Shift position signal • For detailed installation location, refer to TM-12, "A/T CONTROL SYSTEM : Component Parts Location".
③	ECM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Engine status signal - Engine speed signal • For detailed installation location, refer to EC-17, "ENGINE CONTROL SYSTEM : Component Parts Location".
④	BCM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Sleep/wake up signal • For detailed installation location, refer to BCS-4, "BODY CONTROL SYSTEM : Component Parts Location".
⑤	ABS actuator and electric unit (control unit)	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Front LH wheel sensor signal - Front RH wheel sensor signal - Vehicle speed signal - Side G signal - Yaw rate signal • For detailed installation location, refer to BRC-10, "Component Parts Location".
⑥	Chassis control module	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Drive mode signal - Steering angle sensor signal • Transmits mainly the following signals to steering angle main control module via Chassis communication. - Active lane control signal • For detailed installation location, refer to DAS-394, "Component Parts Location".
⑦	Combination meter (Steering warning lamp)	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Odometer signal • For detailed installation location, refer to MWI-7, "METER SYSTEM : Component Parts Location". • Turns ON the power steering warning lamp according to the signal from steering force control module via CAN communication. • For steering warning lamp, refer to STC-52, "WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp".
⑧	Steering angle sensor	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. - Steering angle sensor signal - Steering angle sensor malfunction signal • For detailed installation location, refer to BRC-10, "Component Parts Location".
⑨	Steering force control module	STC-38, "Steering Force Control Module"

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

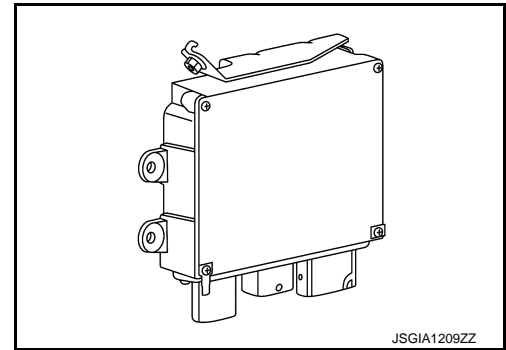
[DIRECT ADAPTIVE STEERING]

No.	Component	Function
⑩	Steering angle sub actuator	Steering angle sub motor
		Sub motor angle sensor
		Sub reduction gear
⑪	Steering angle main actuator	Steering angle main motor
		Main motor angle sensor
		Main reduction gear
		Steering torque sensor
⑫	Steering angle sub control module	STC-39, "Steering Angle Sub Control Module"
⑬	Steering angle main control module	STC-38, "Steering Angle Main Control Module"
⑭	Steering clutch	STC-40, "Steering Clutch"
⑮	Steering force actuator	STC-39, "Steering Force Actuator"

Steering Force Control Module

INFOID:000000011286615

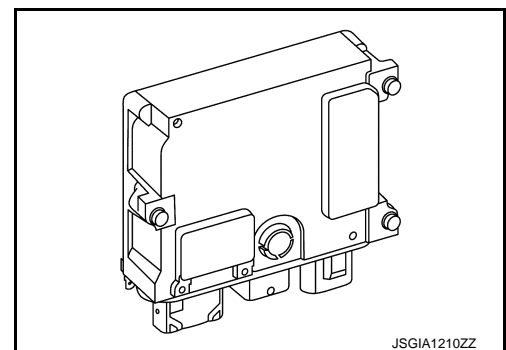
- Calculates the optimum control variable for the steering force motor from the input values of force motor angle sensor and vehicle speed signal to controlling the steering force motor.
- Steering force control module changes steering reaction force based on the drive mode select signal from chassis control module.
- Performs the release and engagement control of the steering clutch.
- If a malfunction occurs in the system, the fail-safe function activates to perform state transition, and the power steering warning lamp in the combination meter illuminates.
- The malfunctioning portion is displayed by the electronic system diagnosis tester (CONSULT) according to the self-diagnosis function.
- Quickly switches the control after a malfunction occurs according to synchronous control using FlexRay communication.



Steering Angle Main Control Module

INFOID:000000011286616

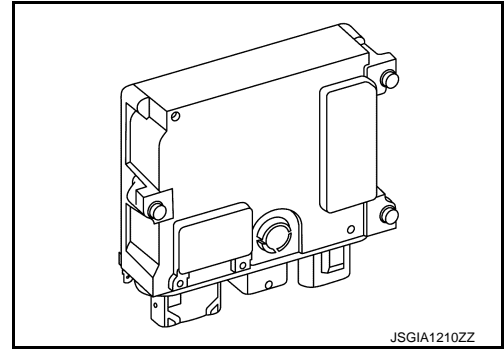
- Calculates the optimum control variable for steering angle main motor from input values of force motor angle sensor, main motor angle sensor, and vehicle speed signal for controlling the steering angle main motor.
- Steering angle main control module changes the steering gear ratio based on the drive mode select signal from chassis control module.
- Quickly switches the control after a malfunction occurs according to synchronous control using FlexRay communication.
- When transferring to EPS mode, this calculates the optimum control variable for steering angle sub motor from input values of steering torque sensor to control steering angle sub motor (Torque assist control).



Steering Angle Sub Control Module

INFOID:000000011286617

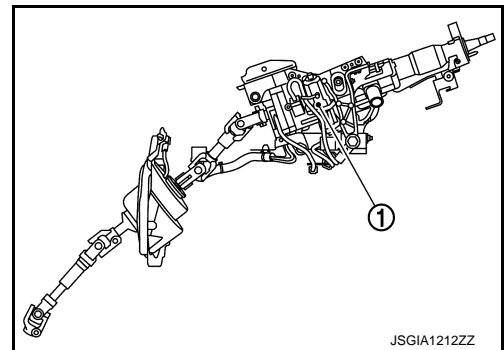
- Calculates the optimum control variable for the steering angle sub motor from input values of force motor angle sensor, sub motor angle sensor, and vehicle speed signal for controlling the steering angle sub motor.
- Quickly switches the control after a malfunction occurs, according to synchronous control using FlexRay communication.



Steering Force Actuator

INFOID:000000011286618

Steering force actuator ① mainly consists of the steering force motor, the force motor angle sensor, and the force motor temperature sensor.



Steering Force Motor

Steering force motor generates a torque equivalent to the reaction force from the road surface by the traction current from the steering force control module.

Force Motor Angle Sensor

Force motor angle sensor detects the angle of the steering force motor and outputs to the steering force control module by converting into voltage.

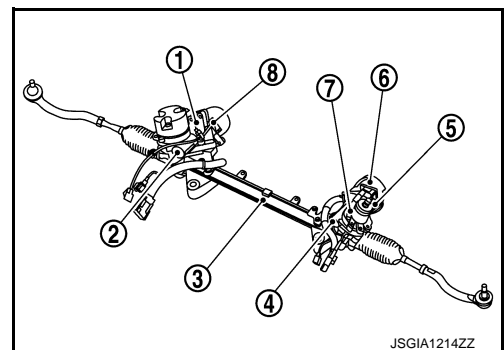
Force Motor Temperature Sensor

Force motor temperature sensor detects the temperature of the steering force motor and outputs to the steering force control module by converting into voltage.

Steering Angle Actuator

INFOID:000000011286619

Steering angle actuator mainly consists of the sub motor angle sensor ①, the sub reduction gear ②, the steering gear ③, main reduction gear ④, the main motor angle sensor ⑤, the steering angle main motor ⑥, the steering torque sensor ⑦, and the steering angle sub motor ⑧.



STEERING GEAR

Steering gear converts the pinion torque into rack axial force and changes the direction of the tires by rotating the knuckle arms.

STEERING TORQUE SENSOR

Steering torque sensor detects the pinion torque and outputs the torque signal to the steering angle main control module by converting into voltage.

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COMPONENT PARTS

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >

STEERING ANGLE MAIN MOTOR

Steering angle main motor generates a steering torque by the traction current from the steering angle main control module.

MAIN REDUCTION GEAR

Main reduction gear increases the steering torque provided from steering angle main motor with worm gears, and outputs to the pinion.

MAIN MOTOR ANGLE SENSOR

Main motor angle sensor detects the angular velocity of the steering angle main motor and outputs to the steering angle main control module by converting into voltage.

STEERING ANGLE SUB MOTOR

Steering angle sub motor generates an assist torque by the traction current from the steering angle sub control module.

SUB REDUCTION GEAR

Sub reduction gear increases the steering assist torque provided from steering angle sub motor with worm gears, and outputs to the steering rack.

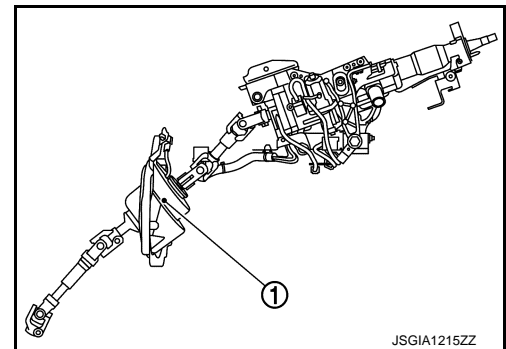
MAIN MOTOR ANGLE SENSOR

Main motor angle sensor detects the angular velocity of the steering angle sub motor and outputs to the steering angle sub control module by converting into voltage.

Steering Clutch

INFOID:000000011286620

- Once electrified from the steering force control module, the steering clutch ① is released and the upper and lower steering shafts are separated.
- When a system malfunction occurs, when system is in protection mode, or when the steering wheel is turned with a force stronger than the butting reaction force generated by the steering force motor, the clutch is engaged while the electric from the steering force control module is shut out, and the upper and lower steering shafts are engaged.

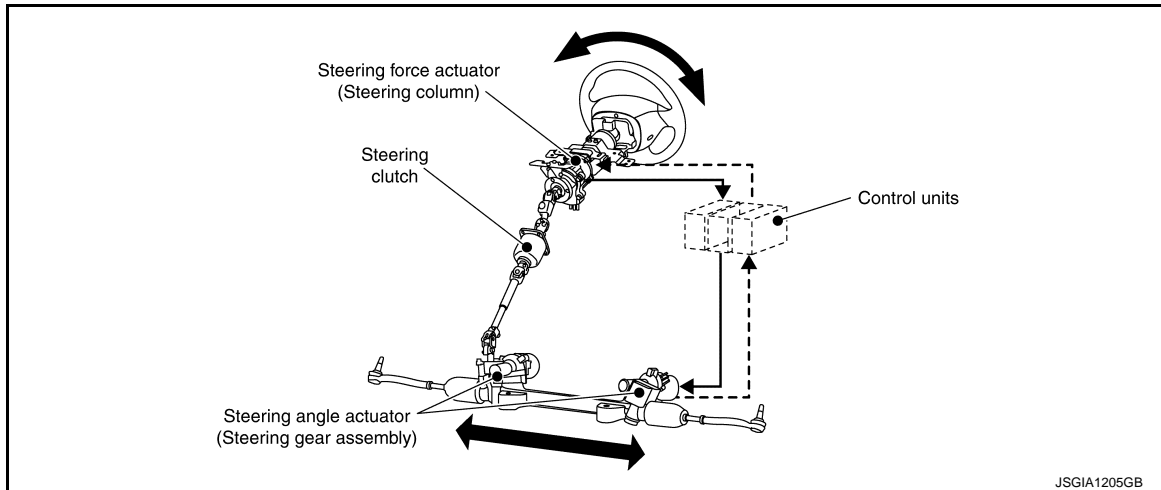


SYSTEM

DIRECT ADAPTIVE STEERING

DIRECT ADAPTIVE STEERING : System Description

INFOID:0000000011286621



JSGIA1205GB

- Instead of the conventional mechanical steering system, the direct adaptive steering that conveys the steering wheel operating to the tires by converting into an electrical signal was adopted.
- By converting the steering wheel operation into an electrical signal, the steering wheel operation is conveyed to the tires without delay.
- Even on a rough road surface, the direction of tires is controlled by the steering angle actuator control to prevent the unpleasant vibration from being conveyed to the steering wheel due to the rough road surface (the necessary information for driving, such as slipperiness of the road, is conveyed to the steering wheel).
- When the system is stopped or abnormal, the portions from the steering wheel to the steering gear assembly are connected mechanically while the steering clutch is engaged, and the steering wheel becomes operative.
- The steering angle actuator (steering gear assembly) and the steering force actuator (steering column) are controlled by 3 control modules. The 3 control modules share the computed result of each data and monitor each other.
- This system is linked with active lane control and applies a slight correction to the steering angle and the steering reaction force to improve the vehicle stability when the vehicle direction is shifted by a cross wind or other forces. For details, refer to [DAS-548. "ACTIVE LANE CONTROL : System Description"](#).
- Infiniti drive mode selector which can change the steering characteristic corresponding to the preference of the driver was adopted. For details, refer to [DMS-7. "Infiniti Drive Mode Selector : System Description"](#).
- This enables trouble diagnosis with CONSULT.

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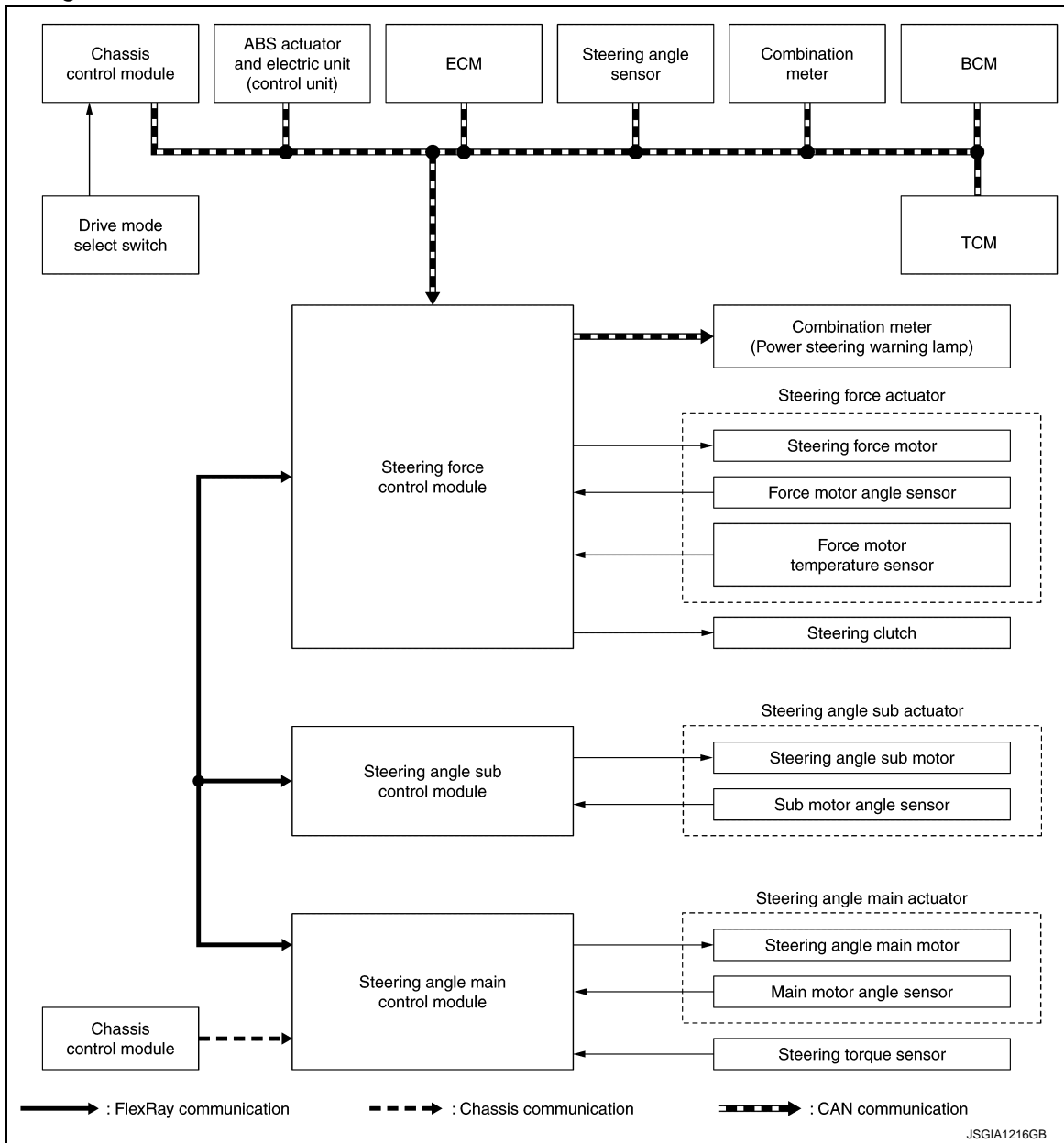
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SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

System Diagram



INPUT/OUTPUT SIGNAL

Communicates the signal from each control unit via CAN communication, Chassis communication or FlexRay communication.

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Control unit	Signal status
Chassis control module	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Drive mode signal - Steering angle sensor signal • Transmits mainly the following signals to steering angle main control module via Chassis communication. <ul style="list-style-type: none"> - Active lane control signal - Steering angle sensor signal*1 - Steering angle sensor malfunction signal*1
ABS actuator and electric unit (control unit)	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Front LH wheel sensor signal - Front RH wheel sensor signal - Vehicle speed signal - Side G signal - Yaw rate signal
ECM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Engine status signal - Engine speed signal • Receives mainly the following signals from steering force control module via CAN communication. <ul style="list-style-type: none"> - Steering torque signal
TCM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Shift position signal
Combination meter	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Odometer signal • Receives mainly the following signals from steering force control module via CAN communication. <ul style="list-style-type: none"> - Power steering warning lamp signal
Steering angle sensor	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Steering angle sensor signal - Steering angle sensor malfunction signal
BCM	<ul style="list-style-type: none"> • Transmits mainly the following signals to steering force control module via CAN communication. <ul style="list-style-type: none"> - Sleep wake up signal
Steering force control module Steering angle main control module Steering angle sub control module	<ul style="list-style-type: none"> • Interactively transmits and receives mainly the following signals via FlexRay communication*2. <ul style="list-style-type: none"> - Direct adaptive steering control signal

*1: Chassis control module transmits the signal (received from steering angle sensor) via Chassis communication

*2: Communication line between the steering force control module, the steering angle main control module, and the steering angle sub control module

Front Wheel Control Mechanism

- Front wheel control mechanism is equipped with a function for calculating steering command angle and for controlling steering angle servo according to the command steering angle.

Steering Command Angle Calculation Function

- Steering force control module calculates steering command angle from the steering angle sensor signal, vehicle speed signal, yaw rate signal, and steering angle speed signal and transmits to the steering angle main control module.
- Steering angle main control module adds the steering angle command from chassis control module to the steering command angle.
- Steering angle main control module changes the steering gear ratio according to the mode change command from the chassis control module.

< SYSTEM DESCRIPTION >

Steering Angle Servo Control Function

- Steering angle main control module drives the steering angle main motor according to the servo command current calculated from the steering command angle and main motor angle, and transmits the command current for assist to the steering angle sub control module.
- Steering angle sub control module drives the steering angle sub motor from the transmitted servo command current and operates assist.

Steering Reaction Force Control Mechanism

- Steering force control module calculates a steering reaction force equivalent to the tire reaction force from steering angle sensor signal, steering angle motor angle, steering angle motor current, and vehicle speed signal to drive steering force motor.
- Steering force control module adds steering reaction force command from chassis control module to steering reaction force.
- Steering force control module changes steering reaction force according to the mode change command from chassis control module.

Back Up Mechanism

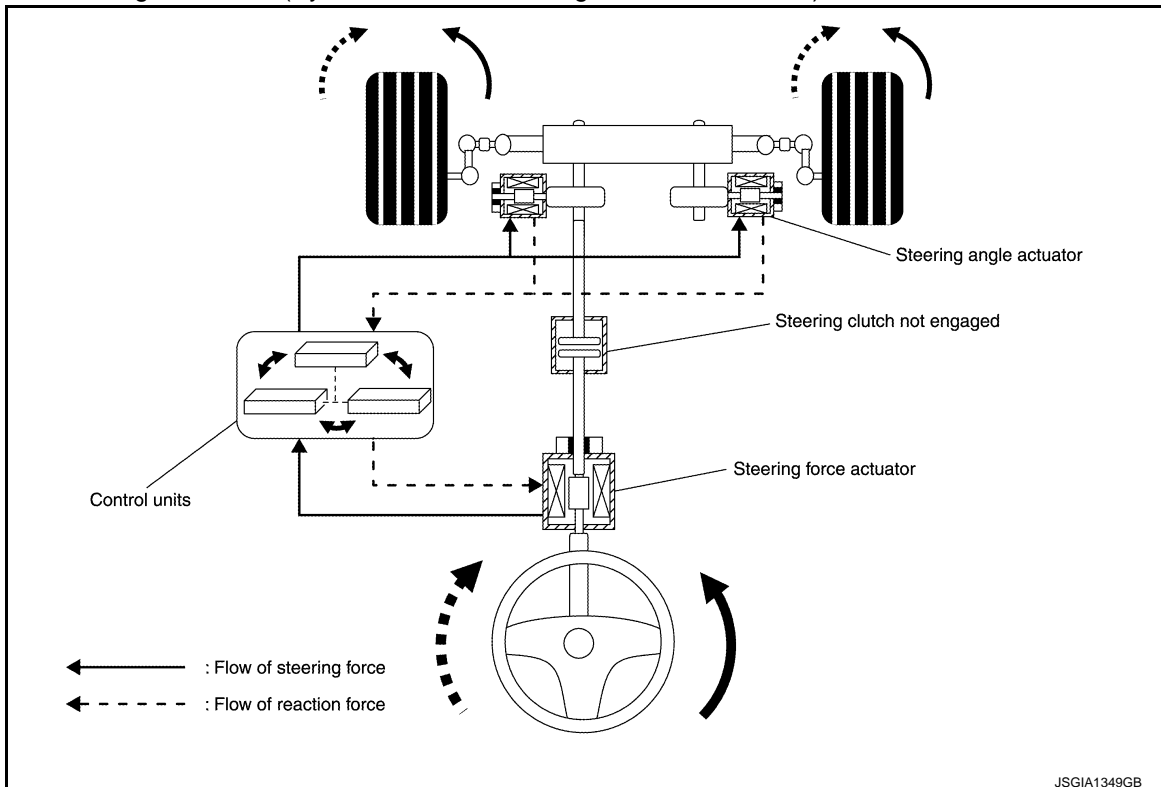
- Steering clutch is released while the system is operating normally. Engages the clutch when the system is stopped, when a malfunction occurs, or when the steering wheel is turned with a force stronger than the reaction force generated by the steering force motor.
- Steering force control module, steering angle main control module, and steering angle sub-control module mutually monitor calculations.

Infiniti Drive Mode Selector

- With Infiniti Drive Mode Selector, the steering characteristics can be set corresponding to the preference of the driver. For details, refer to [DMS-7, "Infiniti Drive Mode Selector : System Description"](#).

OPERATION PRINCIPLE

Turning the Steering to the Left (System is Normal, and Ignition Switch is ON)



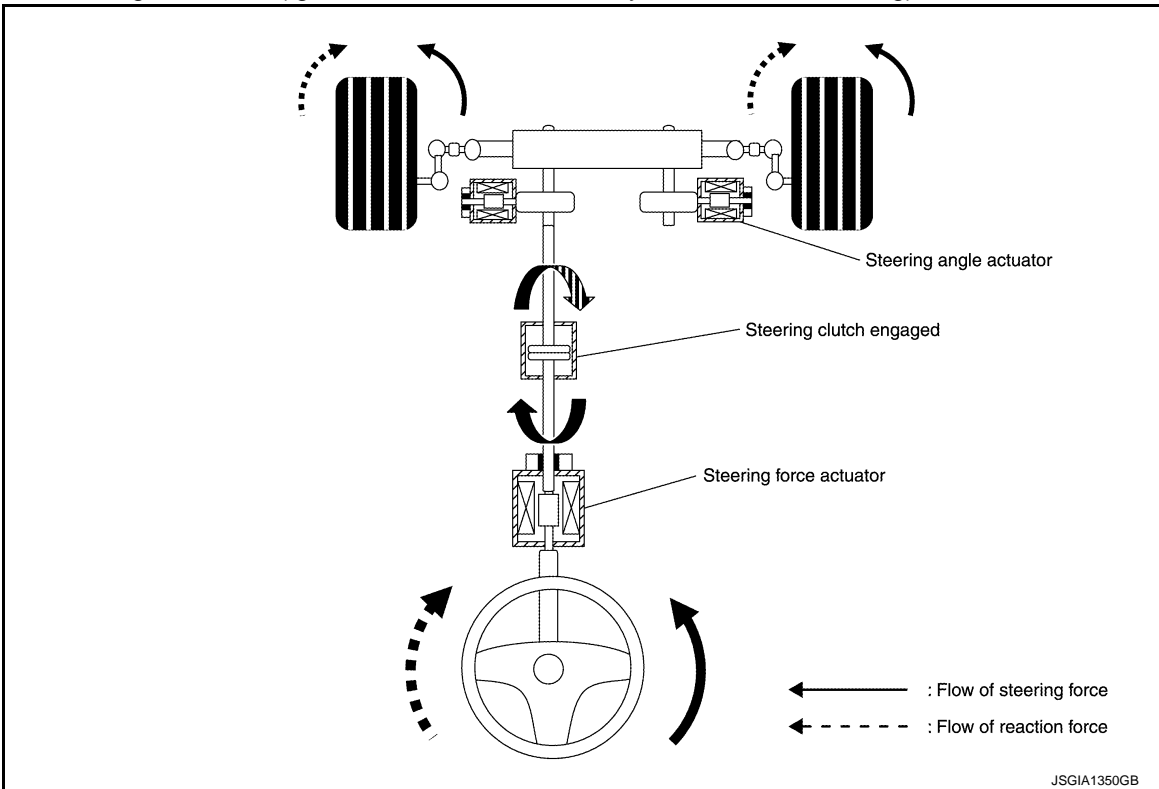
- In the normal state, the steering clutch is not engaged, and the steering wheel is separated from the steering gear assembly.
- If turning the steering wheel to the left, the steering angle actuator is driven, and the tire is turned to the left direction.
- The reaction force from the tires is conveyed from the steering gear assembly to the steering force control module and conveyed to the steering wheel by driving the steering force motor.

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Turning the Steering to the Left (Ignition Switch is OFF, and System is Malfunctioning)



- The steering clutch is engaged, and the system changes to EPS mode, protection mode, or manual steering status.
- No electrical control is performed in manual steering mode.

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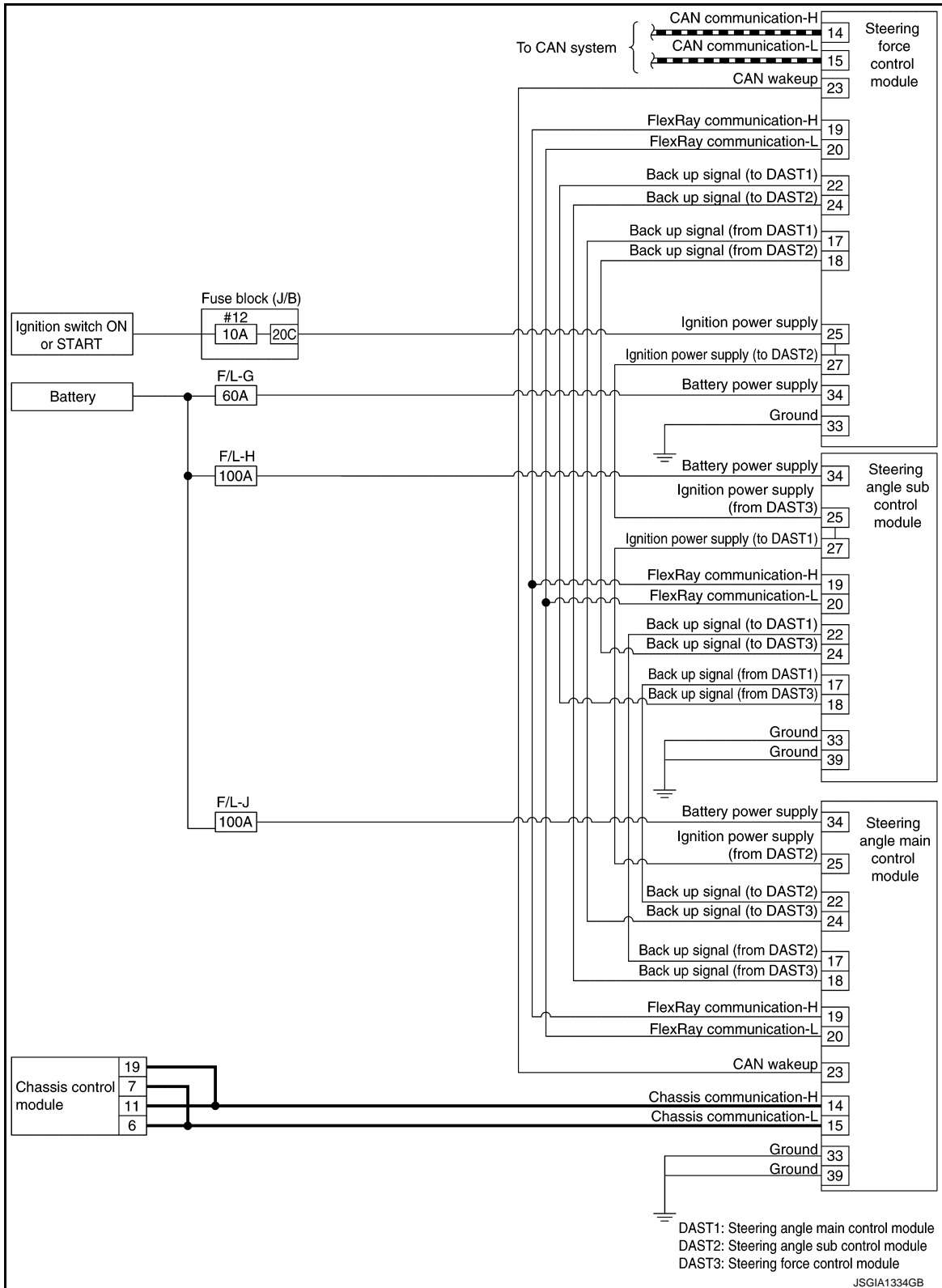
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[DIRECT ADAPTIVE STEERING]

DIRECT ADAPTIVE STEERING : Circuit Diagram

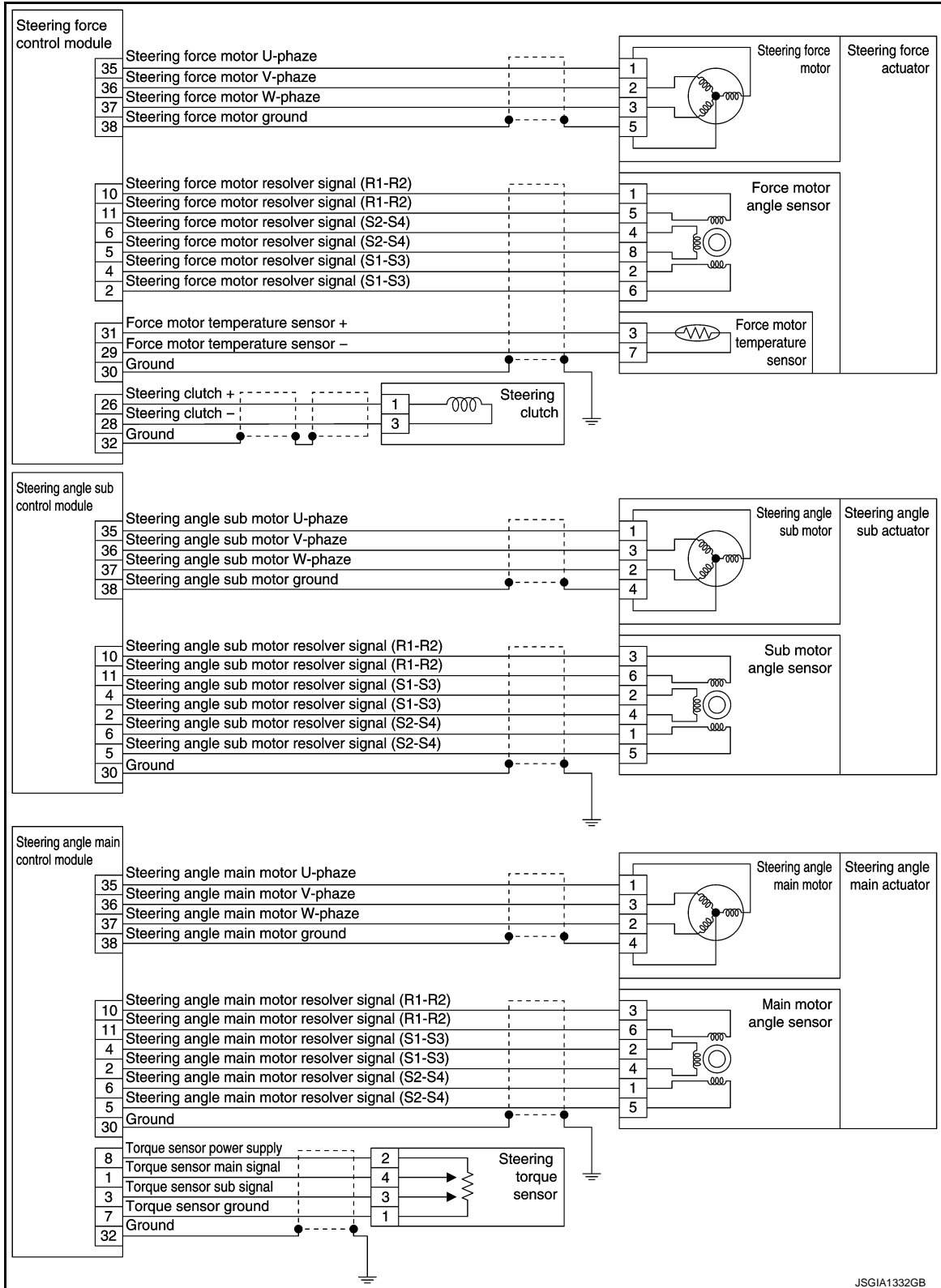
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SYSTEM

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[DIRECT ADAPTIVE STEERING]

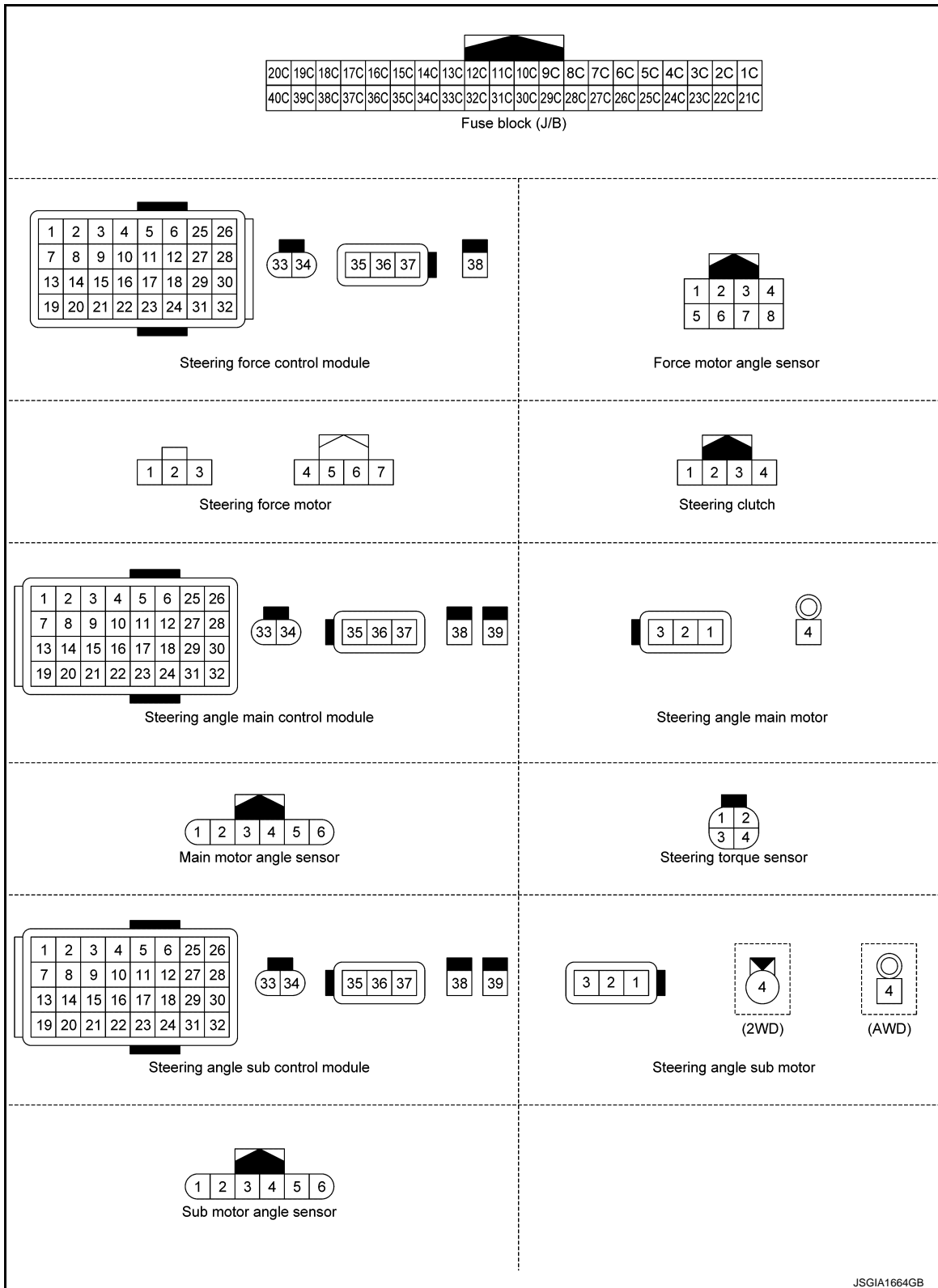


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SYSTEM

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[DIRECT ADAPIVE STEERING]



DIRECT ADAPIVE STEERING : Fail-safe

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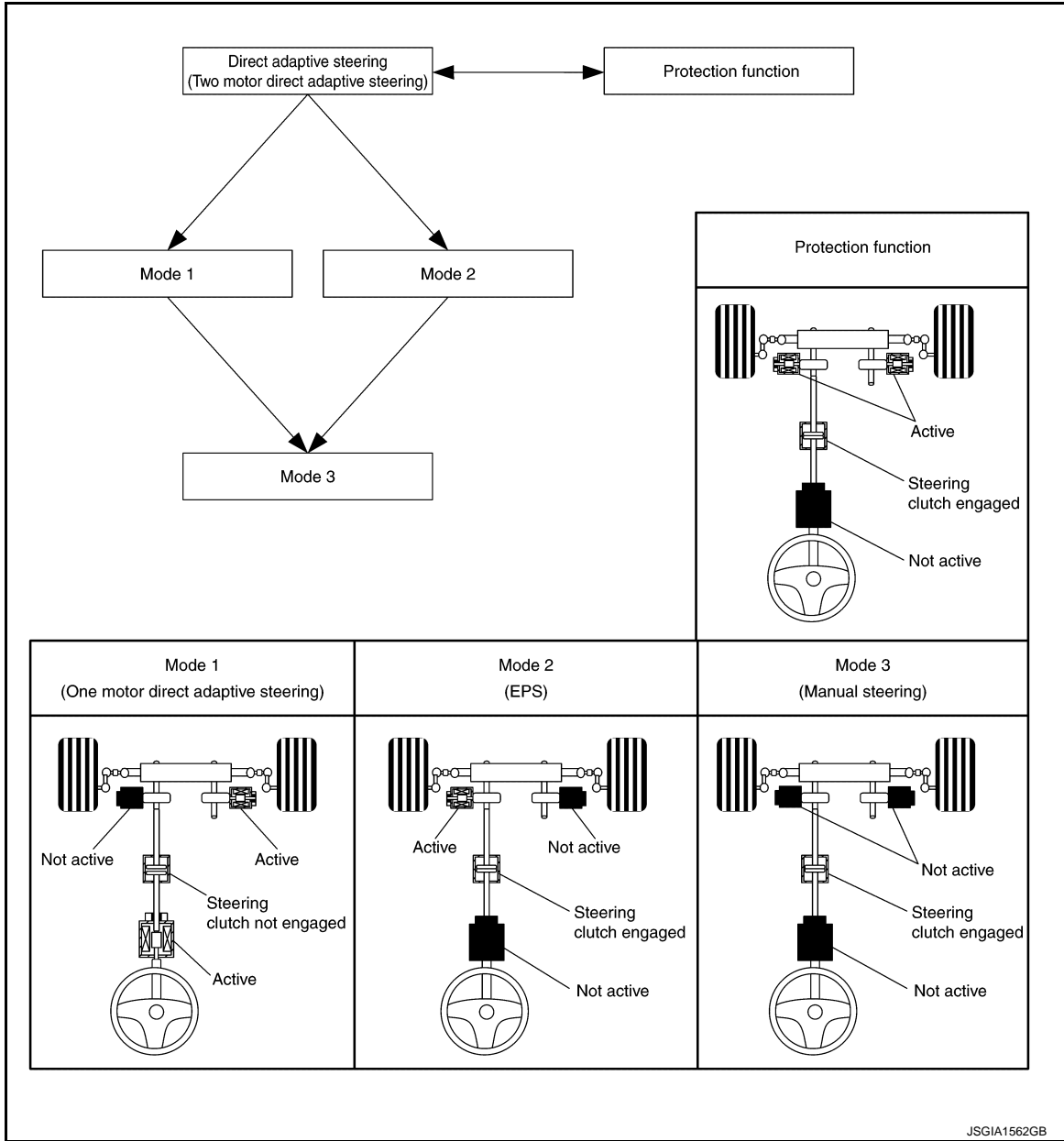
- If a malfunction occurs in the system, the fail-safe function stops the system (mode 3), activates the fail-safe mode (mode 1 or mode 2) or activates the protection mode. When the system enters mode 1, mode 2 or mode 3, the power steering warning lamp illuminates to inform the driver that the turning force is heavy in effect.
- Since three control modules monitor malfunctions mutually, DTC code varies from control module to control module.

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

- For details of protection function, refer to [STC-51. "DIRECT ADAPTIVE STEERING : Protection Function"](#).



DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13A0-00	Variable	Variable	Variable
C13A1-00	—	Mode 2	Mode 2
C13A2-00	Mode 1 or Mode 3	Mode 1 or Mode 3	Mode 1 or Mode 3
C13A3-00	Mode 2	Mode 2	Mode 2
C13A4-00	—	Mode 2	Mode 2
C13A5-00	—	—	Mode 2
C13A6-00	—	Mode 3	—
C13A7-00	—	Mode 3	—
C13A8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13A9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AA-00	Mode 2	Mode 3	Mode 2

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13AB-00	Mode 2	Mode 3	Mode 2
C13AC-00	—	Mode 3	—
C13AD-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AE-00	Mode 2	Mode 3	Mode 2
C13AF-00	Mode 2	Mode 3	Mode 2
C13B0-00	Mode 2	Mode 3	Mode 2
C13B1-00	Mode 2	Mode 3	Mode 2
C13B2-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B3-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B4-00	Mode 2	Mode 3	Mode 2
C13B5-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13BA-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13BB-00	—	—	—
C13BC-00	—	—	—
C13BD-00	—	Mode 2	—
C13BE-00	Mode 2	Mode 2	Mode 2
C13BF-00	Variable	Variable	Variable
C13C0-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
C13C1-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C2-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C3-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C4-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13C5-00	Mode 2	—	—
C13C6-00	Mode 2	—	—
C13C7-00	Mode 2	—	—
C13C8-00	—	—	—
C13C9-00	—	—	—
C13CA-00	—	—	—
C13CB-00	—	—	—
C13CC-00	—	—	—
C13CD-00	—	—	—
C13CE-00	—	—	—
C13CF-00	—	—	—
C13D0-00	—	—	—
C13D1-00	—	—	—
C13D2-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D3-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D4-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D5-00	Mode 2	Mode 1 or Mode 3	Mode 2

SYSTEM

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13D6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D8-00	—	—	—
C13D9-00	—	—	—
C13DA-00	—	—	—
C13DB-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DC-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DD-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DE-00	Protection function mode	Protection function mode	Protection function mode
C13DF-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13E0-00	Mode 2	—	—
C13E1-00	Mode 2	—	—
C13E2-00	—	—	—
C13E3-00	Protection function mode	—	—
C13E4-00	Protection function mode	—	—
C13E5-00	Mode 2	—	—
C13E6-00	Protection function mode	Protection function mode	Protection function mode
C13E7-00	Protection function mode	Protection function mode	Protection function mode
C13E8-00	Protection function mode	Protection function mode	Protection function mode
C13E9-00	—	Mode 2	—
C13EA-00	Mode 2	—	—
C13EB-00	—	Mode 2	Mode 2
C13EE-00	Mode 3	Mode 3	Mode 3
C13EF-00	Mode 3	Mode 3	Mode 3
C13F0-00	Mode 2	Mode 2	Mode 2
C13F1-00	Mode 2	—	—
C13F2-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
U1000-01	—	—	—
U1010-49	—	—	—

- *1: When control module detects a malfunction at startup.
- *2: When control module detects a malfunction except during startup.

DIRECT ADAPTIVE STEERING : Protection Function

INFOID:0000000011286624

- When battery voltage malfunctions temporarily, system overheats continuously and system is overloaded continuously, system is in protection mode temporarily. This is not malfunction.
- When a causative condition is cleared, the system returns to normal control automatically. (Except C13E5-00)
- Since the protection function condition is not malfunction, power steering warning lamp does not turn ON. (Except C13E5-00) The following DTCs remain to distinguish from malfunction.

SYSTEM

< SYSTEM DESCRIPTION >


[DIRECT ADAPTIVE STEERING]

DTC	Condition	Vehicle condition
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering operation may become heavy temporarily, however steering wheel can be operated without interference. This is not a system malfunction.)
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.	
C13E5-00	When steering clutch is released, steering clutch is not released in spite of trying to release it many times with overloading steering wheel.	
C13E6-00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more.	
	DAST 1, DAST 2: Internal temperature of control module is 90°C (194°F) or more.	
C13E7-00	Power supply voltage of control module is low temporarily.	
C13E8-00	<ul style="list-style-type: none"> • Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. • Steering gear is out of neutral position. (Large) 	

WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning Lamp/Indicator Lamp

INFOID:000000011286625

Name	Design	Layout/Function
Steering warning lamp		For layout, refer to MWI-8, "METER SYSTEM : Design" .
		For function, refer to MWI-38, "WARNING LAMPS/INDICATOR LAMPS : Power Steering Warning Lamp" .

HANDLING PRECAUTION

Handling Precautions for Direct Adaptive Steering

INFOID:000000011286626

WARNING:

When the power steering warning lamp illuminates with the engine running, the power assist for the steering will cease operation. Driver will still have control of the vehicle, but the steering will be harder to operate.

CAUTION:

- If wheels or tires other than the recommended ones are used, the direct adaptive steering system may not operate properly and the power steering warning lamp may illuminate.
- Do not modify the vehicle's suspension. If suspension parts such as shock absorbers, struts, springs, stabilizer bars, bushings and wheels are not recommended for the vehicle or are extremely deteriorated, the direct adaptive steering system may not operate properly and the power steering warning lamp may illuminate.
- Do not modify the vehicle's steering. If steering parts are not recommended for the vehicle or are extremely deteriorated, the direct adaptive steering system may not operate properly and the power steering warning lamp may illuminate.
- If the VDC warning lamp illuminates, the power steering warning lamp may also illuminate at the same time. Stop the vehicle in a safe location, turn the engine off and restart the engine. If the power steering warning lamp continues to illuminate, have the system checked.
- Do not place the ignition switch in the ON position while the steering wheel or a tire is removed.
- Do not turn the steering wheel as much as possible while the ignition switch is in any position other than the ON position.
- Installing an accessory on the steering wheel, or changing the steering wheel, may reduce the steering performance.
- When the steering wheel is operated repeatedly or continuously while parking or driving at a very low speed, the power assist for the steering wheel will be reduced and the steering wheel may be off-center or feeling in turning steering wheel may change. This is to prevent overheating of the direct adaptive steering system and protect it from getting damaged. When the temperature of the direct adaptive steering system cools down, the power assist level will return to normal. Avoid repeating steering wheel operations that could cause the direct adaptive steering system to overheat.
- When the power steering warning lamp illuminates with the engine running, the power assist for the steering will cease operation. Driver will still have control of the vehicle. However, greater steering effort will be needed, especially in sharp turns, at low speeds, and at vehicle stopped.
- If the direct adaptive steering system is malfunctioning, the steering wheel may be off-center or feeling in turning steering wheel may change.
- Under the followings, the steering wheel may be off-center or feeling in turning steering wheel may change. This is due to a protection mechanism for the direct adaptive steering system.
 - When the battery is discharged.
 - When the engine is stalled.
 - After the vehicle is tested on the fourwheel dynamometer.
 - When driver turns steering wheel in the front tire side face touching an obstruction like curb stone.
- The steering wheel will return to the normal position after the protection mechanism deactivates. To return to normal condition from protection mode, leave the vehicle or restart the engine. When the steering wheel is off-center, turn the steering wheel to right and left to return the normal position after returning to the normal condition.
- When the vehicle is tested on the 2-wheel dynamometer, the power steering warning light may illuminate. To turn off the power steering warning lamp, stop the vehicle in a safe location, turn the engine off, restart the engine, and then drive the vehicle for a period of time.
- The following conditions do not indicate a malfunction of the direct adaptive steering system.
 - Driver may notice wider steering play when the ignition switch is in the OFF or ACC position compared to when it is in the ON position.
 - After the engine is started, the steering wheel may be off-center or feeling in turning steering wheel may change. To return to the normal position, drive the vehicle on a straight road for a period of time.
- Driver may hear a noise under the following conditions. However, this is not a malfunction.
 - When the engine is started or stopped.
 - When the steering wheel is turned in the full lock position.

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DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

CONSULT Function

INFOID:0000000011286627

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes as follows.

Diagnostic test mode	Function
ECU Identification	Steering force control module part number can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the steering force control module can be read.
Work support	This mode enable a technician to adjust some devices faster and more accurately by following the indication on the CONSULT.
Re/programming. Configuration	<ul style="list-style-type: none">• Read and save the vehicle specification (TYPE ID).• Write the vehicle specification (TYPE ID) when replacing steering force control module.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Steering force control module part number can be read.

SELF DIAGNOSTIC RESULT

Refer to [STC-79. "DTC Index"](#).

When "PRSNT" is displayed on self-diagnosis result.

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

- System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed.

Freeze Frame Data Item	Description
TOTAL DISTANCE	Display the odometer value from combination meter via CAN communication.
OWN ECU SYS STATUS	Display the status of steering force control module.
ST ANG MAIN SYS STATUS	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS	Display the status of steering angle sub control module.
ST FORCE SYS STATUS	Display the status of steering force control module.
BACK UP CIRCUIT STATUS	Display the status of buck up circuit.
CONTROL MODULE CRNT	Display the electric current value of steering force control module.
DETAILED CODE 1	This is displayed, but it is not used.
DETAILED CODE 2	This is displayed, but it is not used.
DETAILED CODE 3	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS	Display the sync status of FlexRay communication.
STEERING MODE	Display the steering mode.
ST CLUTCH PRTCT STATUS	Display the status of steering clutch.
ST CLUTCH CON RQEST	Display the control request status steering clutch.
SHIFT POSITION	Display the shift position from TCM via CAN communication.
FLEXRAY COMM DIAG (OWN)	Display the diagnosis status of FlexRay communication. (steering force control module)
FLEXRAY COMM DIAG (OTH1)	Display the diagnosis status of FlexRay communication. (steering angle main control module)

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Freeze Frame Data Item	Description	
FLEXRAY COMM DIAG (OTH2)	Display the diagnosis status of FlexRay communication. (steering angle sub control module)	A
POWER TRAIN STATUS	Display the status of power train.	B
IGN SW STATUS (OWN ECU)	Display the ignition voltage status recognized by steering force control module.	C
IGN SW STATUS (SYSTEM)	Display the status of ignition voltage for direct adaptive steering.	D
STOP/START STATUS	Display the status of stop/start system from ECM via CAN communication.	E
INSTANT VLT DROP DETECT	Display the status of instantaneous voltage drop detection.	F
CURB STONE DETECT STATS	Display the status of curb stone detection.	G
BACK UP CIRCUIT A STATUS	Display the status of buck up circuit A.	H
BACK UP CIRCUIT B STATUS	Display the status of buck up circuit B.	I
FREE ROLLER MODE	Display the status of free roller mode.	J
CHASSIS DYNAMO MODE	Display the status of chassis dynamometer mode.	K
WRITING STATUS	Display the status the recorded angle information in steering force control module.	L
BACK UP SIG 1 VOLT	Display the voltage of buck up signal 1.	M
BACK UP SIG 2 VOLT	Display the voltage of buck up signal 2.	N
INVERTER RELAY ACT VOLT	Display the activation voltage of inverter relay.	O
CONT MODULE INSIDE VOLT	Display the inside voltage of steering force control module.	P
BATTERY VOLTAGE	Display the power supply voltage for steering force control module.	
IGN VOLTAGE	Display the ignition power supply voltage for steering force control module.	
C/M TEMPERATURE	Display the temperature of steering force motor.	
VEHICLE SPEED	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.	
YAW RATE	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.	
SIDE G	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.	
ST CLUTCH ACT CURRENT	Display the activation current of steering clutch.	
MOTOR U ACT CURRENT	Display the activation current of steering force motor U phase.	
MOTOR W ACT CURRENT	Display the activation current of steering force motor W phase.	
TORQUE SEN MAIN 1	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.	
TEMPERATURE SENSOR	Display the temperature of steering force motor.	
ENGINE SPEED	Display the engine speed from ECM via CAN communication.	
ANGLE SENSOR SIGNAL 1	Display the voltage of angle sensor signal.	
ANGLE SENSOR SIGNAL 2	Display the voltage of angle sensor signal.	
ANGLE 1	Display the accuracy of calibration.	
ANGLE 2	Display the command angle for steering angle main motor and steering angle sub motor.	
F/B ANGLE 1	Display the feedback angle for steering angle main motor and steering angle sub motor.	
F/B ANGLE 2	Display the feedback angle for steering angle main motor and steering angle sub motor.	
ST ANGLE SENSOR	Display the steering angle from steering angle sensor via CAN communication.	
ANGLE DIFFERENCE	Display the difference angle between steering wheel and steering pinion.	
STEERING PINION ANGLE	Display the steering pinion angle.	
STEERING PINION ANGLE 2	Display the steering pinion angle.	
ANGLE 3	Display the angle information used for system control.	

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DATA MONITOR

NOTE:

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

X: Applicable

Monitor item [Unit]	Remarks
OWN ECU SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering force control module.
ST ANG MAIN SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle sub control module.
ST FORCE SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering force control module.
BACK UP CIRCUIT STATUS [0 – 255]	Display the status of buck up circuit.
CONTROL MODULE CRNT [A]	Display the electric current value of steering force control module.
DETAILED CODE 1 [0 – 255]	This is displayed, but it is not used.
DETAILED CODE 2 [0 – 255]	This is displayed, but it is not used.
DETAILED CODE 3 [0 – 255]	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS [STAT1/STAT2/STAT3/STAT4/STAT5/ STAT6/STAT7/STAT8/STAT9/STAT10]	Display the sync status of FlexRay communication.
STEERING MODE [CHARA A/CHARA B/CHARA C/CHARA D/ CHARA E/CHARA F/CHARA G/CHARA H/ CHARA I]	Display the steering mode.
ST CLUTCH PRTCT STATUS [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5/STAT6/STAT7/STAT8/STAT9/ STAT10/STAT11/STAT12/STAT20]	Display the status of steering clutch.
ST CLUTCH CON RQEST [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5]	Display the control request status steering clutch.
SHIFT POSITION [IDLE/1ST/2ND/3RD/4TH/5TH/6TH/7TH/ 8TH/R/N/P/CVT/UKNWN]	Display the shift position from ECM via CAN communication.

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks	
FLEXRAY COMM DIAG (OWN) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering force control module)	A
FLEXRAY COMM DIAG (OTH1) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle main control module)	B
FLEXRAY COMM DIAG (OTH2) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle sub control module)	C
POWER TRAIN STATUS [STOP/RUN]	Display the status of power train.	
IGN SW STATUS (OWN ECU) [ON/OFF]	Display the ignition voltage status recognized by steering force control module.	
IGN SW STATUS (SYSTEM) [ON/OFF]	Display the status of ignition voltage for direct adaptive steering.	D
STOP/START STATUS [ON/OFF]	Display the status of stop/start system from ECM via CAN communication.	
INSTANT VLT DROP DETECT [UNDTCT/DETECT]	Display the status of instantaneous voltage drop detection.	E
CURB STONE DETECT STATS [UNDTCT/DETECT]	Display the status of curb stone detection.	
BACK UP CIRCUIT A STATUS [STAT1/STAT2]	Display the status of buck up circuit A.	F
BACK UP CIRCUIT B STATUS [STAT1/STAT2]	Display the status of buck up circuit B.	STC
FREE ROLLER MODE [ON/OFF]	Display the status of free roller mode.	
CHASSIS DYNAMO MODE [PERMIT/ PROHBT]	Display the status of chassis dynamometer mode.	H
WRITING STATUS [OK/NG]	Display the status the recorded angle information in steering force control module.	
BACK UP SIG 1 VOLT [V]	Display the voltage of buck up signal 1.	I
BACK UP SIG 2 VOLT [V]	Display the voltage of buck up signal 2.	
INVERTER RELAY ACT VOLT [V]	Display the activation voltage of inverter relay.	
CONT MODULE INSIDE VOLT [V]	Display the inside voltage of steering force control module.	J
BATTERY VOLTAGE [V]	Display the power supply voltage for steering force control module.	
IGN VOLTAGE [V]	Display the ignition power supply voltage for steering force control module.	
C/M TEMPERATURE [°C] or [°F]	Display the temperature of steering force motor.	K
VEHICLE SPEED [km/h] or [MPH]	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.	L
YAW RATE [deg/s]	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.	
SIDE G [m/s ²]	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.	M
ST CLUTCH ACT CURRENT [A]	Display the activation current of steering clutch.	
MOTOR U ACT CURRENT [A]	Display the activation current of steering force motor U phase.	N
MOTOR W ACT CURRENT [A]	Display the activation current of steering force motor W phase.	
TORQUE SEN MAIN 1 [N·m]	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.	
TEMPERATURE SENSOR [°C] or [°F]	Display the temperature of steering force motor.	O
ENGINE SPEED [Tr/min]	Display the engine speed from ECM via CAN communication.	
ANGLE SENSOR SIGNAL 1 [V]	Display the voltage of force motor angle sensor signal.	P
ANGLE SENSOR SIGNAL 2 [V]	Display the voltage of force motor angle sensor signal.	
ANGLE 1 [deg]	Display the accuracy of calibration.	
ANGLE 2 [deg]	Display the command angle for steering angle main motor and steering angle sub motor.	
F/B ANGLE 1 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.	
F/B ANGLE 2 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.	
ST ANGLE SENSOR [deg]	Display the steering angle from steering angle sensor via CAN communication.	

DIAGNOSIS SYSTEM (STEERING FORCE CONTROL MODULE)

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >

Monitor item [Unit]	Remarks
ANGLE DIFFERENCE [deg]	Display the difference angle between steering wheel and steering pinion.
STEERING PINION ANGLE [deg]	Display the steering pinion angle.
STEERING PINION ANGLE 2 [deg]	Display the steering pinion angle.
ANGLE 3 [deg]	Display the angle information used for system control.

WORK SUPPORT

Item	Description
DAST CALIBRATION (MODE1)	Perform direct adaptive steering calibration. (with alignment tester)
DAST CALIBRATION (MODE2)	Perform direct adaptive steering calibration. (without alignment tester)

CAUTION:

Never use “DAST CALIBRATION (MODE 1)” and “DAST CALIBRATION (MODE 2)” alone. When removing/installing/replacing the component parts or adjusting wheel alignment, refer to [STC-122, "Special Repair Requirement"](#).

RE/PROGRAMMING, CONFIGURATION

Configuration includes the following functions.

Item	Description
Read/Write Configuration	Before replacing ECU Allows the reading of vehicle specification (Type ID) written in steering force control module to store the specification in CONSULT.
	After replacing ECU Allows the writing of vehicle information (Type ID) stored in CONSULT into the steering force control module.
Manual Configuration	Allows the writing of vehicle specification (Type ID) into the steering force control module by hand.

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

CONSULT Function

INFOID:000000011286628

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes as follows.

Diagnostic test mode	Function
ECU Identification	Steering angle main control module part number can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the steering angle main control module can be read.
Re/programming. Configuration	<ul style="list-style-type: none">Read and save the vehicle specification (TYPE ID).Write the vehicle specification (TYPE ID) when replacing steering angle main control module.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Steering angle main control module part number can be read.

SELF DIAGNOSTIC RESULT

Refer to [STC-92, "DTC Index"](#).

When "PRNT" is displayed on self-diagnosis result.

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

- System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed.

Freeze Frame Data Item	Description
TOTAL DISTANCE	Display the odometer value from combination meter via CAN communication.
OWN ECU SYS STATUS	Display the status of steering angle main control module.
ST ANG MAIN SYS STATUS	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS	Display the status of steering angle sub control module.
ST FORCE SYS STATUS	Display the status of steering force control module.
BACK UP CIRCUIT STATUS	Display the status of buck up circuit.
CONTROL MODULE CRNT	Display the electric current value of steering angle main control module.
DETAILED CODE 1	This is displayed, but it is not used.
DETAILED CODE 2	This is displayed, but it is not used.
DETAILED CODE 3	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS	Display the sync status of FlexRay communication.
STEERING MODE	Display the steering mode.
ST CLUTCH PRTCT STATUS	Display the status of steering clutch.
ST CLUTCH CON RQUEST	Display the control request status steering clutch.
FLEXRAY COMM DIAG (OWN)	Display the diagnosis status of FlexRay communication. (steering angle main control module)
FLEXRAY COMM DIAG (OTH1)	Display the diagnosis status of FlexRay communication. (steering angle sub control module)
FLEXRAY COMM DIAG (OTH2)	Display the diagnosis status of FlexRay communication. (steering force control module)
POWER TRAIN STATUS	Display the status of power train.

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Freeze Frame Data Item	Description
IGN SW STATUS (OWN ECU)	Display the ignition voltage status recognized by steering angle main control module.
IGN SW STATUS (SYSTEM)	Display the status of ignition voltage for direct adaptive steering.
STOP/START STATUS	Display the status of stop/start system from ECM via CAN communication.
INSTANT VLT DROP DETECT	Display the status of instantaneous voltage drop detection.
CURB STONE DETECT STATS	Display the status of curb stone detection.
BACK UP CIRCUIT A STATUS	Display the status of buck up circuit A.
BACK UP CIRCUIT B STATUS	Display the status of buck up circuit B.
FREE ROLLER MODE	Display the status of free roller mode.
CHASSIS DYNAMO MODE	Display the status of chassis dynamometer mode.
WRITING STATUS	Display the status the recorded angle information in steering angle main control module.
BACK UP SIG 1 VOLT	Display the voltage of buck up signal 1.
BACK UP SIG 2 VOLT	Display the voltage of buck up signal 2.
INVERTER RELAY ACT VOLT	Display the activation voltage of inverter relay.
CONT MODULE INSIDE VOLT	Display the inside voltage of steering angle main control module.
BATTERY VOLTAGE	Display the power supply voltage for steering angle main control module.
IGN VOLTAGE	Display the ignition power supply voltage for steering angle main control module.
C/M TEMPERATURE	Display the internal temperature of steering angle main control module.
VEHICLE SPEED	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.
YAW RATE	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.
SIDE G	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.
ST CLUTCH ACT CURRENT	Display the activation current of steering clutch.
MOTOR U ACT CURRENT	Display the activation current of steering angle main motor U phase.
MOTOR W ACT CURRENT	Display the activation current of steering angle main motor W phase.
TORQUE SEN MAIN 2	Display the steering torque sensor (main 2) value.
TORQUE SEN MAIN 1	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.
TORQUE SEN SUB	Display the steering torque sensor (sub) value.
TORQUE SEN VOLTAGE	Display the power supply voltage for steering torque sensor.
TEMPERATURE SENSOR	Display the temperature of steering angle main control module.
SUB IGN VOLTAGE	Display the sub ignition power supply voltage for steering angle main control module.
ANGLE SENSOR SIGNAL 1	Display the voltage of angle sensor signal.
ANGLE SENSOR SIGNAL 2	Display the voltage of angle sensor signal.
ANGLE 1	Display the accuracy of calibration.
ANGLE 2	Display the command angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 1	Display the feedback angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 2	Display the feedback angle for steering angle main motor and steering angle sub motor.
ST ANGLE SENSOR	Display the steering angle from steering angle sensor via CAN communication.
ANGLE DIFFERENCE	Display the difference angle between steering wheel and steering pinion.
STEERING PINION ANGLE	Display the steering pinion angle.
STEERING PINION ANGLE 2	Display the steering pinion angle.
ANGLE 3	Display the angle information used for system control.

DATA MONITOR

NOTE:

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

[DIRECT ADAPTIVE STEERING]

< SYSTEM DESCRIPTION >

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

X: Applicable

Monitor item [Unit]	Remarks
OWN ECU SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle main control module.
ST ANG MAIN SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle sub control module.
ST FORCE SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering force control module.
BACK UP CIRCUIT STATUS [0 – 255]	Display the status of buck up circuit.
CONTROL MODULE CRNT [A]	Display the electric current value of steering angle main control module.
DETAILED CODE 1 [0 – 255]	This is displayed, but it is not used.
DETAILED CODE 2 [0 – 255]	This is displayed, but it is not used.
DETAILED CODE 3 [0 – 255]	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS [STAT1/STAT2/STAT3/STAT4/STAT5/ STAT6/STAT7/STAT8/STAT9/STAT10]	Display the sync status of FlexRay communication.
STEERING MODE [CHARA A/CHARA B/CHARA C/CHARA D/ CHARA E/CHARA F/CHARA G/CHARA H/ CHARA I]	Display the steering mode.
ST CLUTCH PRTCT STATUS [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5/STAT6/STAT7/STAT8/STAT9/ STAT10/STAT11/STAT12/STAT20]	Display the status of steering clutch.
ST CLUTCH CON RQEST [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5]	Display the control request status steering clutch.
FLEXRAY COMM DIAG (OWN) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle main control module)
FLEXRAY COMM DIAG (OTH1) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle sub control module)

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DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks
FLEXRAY COMM DIAG (OTH2) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle force control module)
POWER TRAIN STATUS [STOP/RUN]	Display the status of power train.
IGN SW STATUS (OWN ECU) [ON/OFF]	Display the ignition voltage status recognized by steering angle main control module.
IGN SW STATUS (SYSTEM) [ON/OFF]	Display the status of ignition voltage for direct adaptive steering.
STOP/START STATUS [ON/OFF]	Display the status of stop/start system from ECM via CAN communication.
INSTANT VLT DROP DETECT [UNDTCT/DETECT]	Display the status of instantaneous voltage drop detection.
CURB STONE DETECT STATS [UNDTCT/DETECT]	Display the status of curb stone detection.
BACK UP CIRCUIT A STATUS [STAT1/STAT2]	Display the status of buck up circuit A.
BACK UP CIRCUIT B STATUS [STAT1/STAT2]	Display the status of buck up circuit B.
FREE ROLLER MODE [ON/OFF]	Display the status of free roller mode.
CHASSIS DYNAMO MODE [PERMIT/ PROHBT]	Display the status of chassis dynamometer mode.
WRITING STATUS [OK/NG]	Display the status the recorded angle information in steering angle main control module.
BACK UP SIG 1 VOLT [V]	Display the voltage of buck up signal 1.
BACK UP SIG 2 VOLT [V]	Display the voltage of buck up signal 2.
INVERTER RELAY ACT VOLT [V]	Display the activation voltage of inverter relay.
CONT MODULE INSIDE VOLT [V]	Display the inside voltage of steering angle main control module.
BATTERY VOLTAGE [V]	Display the power supply voltage for steering angle main control module.
IGN VOLTAGE [V]	Display the ignition power supply voltage for steering angle main control module.
C/M TEMPERATURE [°C] or [°F]	Display the internal temperature of steering angle main control module.
VEHICLE SPEED [km/h] or [MPH]	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.
YAW RATE [deg/s]	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.
SIDE G [m/s ²]	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.
ST CLUTCH ACT CURRENT [A]	Display the activation current of steering clutch.
MOTOR U ACT CURRENT [A]	Display the activation current of steering angle main motor U phase.
MOTOR W ACT CURRENT [A]	Display the activation current of steering angle main motor W phase.
TORQUE SEN MAIN 2 [V]	Display the steering torque sensor (main 2) value.
TORQUE SEN MAIN 1 [N·m]	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.
TORQUE SEN SUB [V]	Display the steering torque sensor (sub) value.
TORQUE SEN VOLTAGE [V]	Display the power supply voltage for steering torque sensor.
TEMPERATURE SENSOR [°C] or [°F]	Display the temperature of steering angle main control module.
SUB IGN VOLTAGE [V]	Display the sub ignition power supply voltage for steering angle main control module.
ANGLE SENSOR SIGNAL 1 [V]	Display the voltage of angle main motor angle sensor signal.
ANGLE SENSOR SIGNAL 2 [V]	Display the voltage of angle main motor angle sensor signal.
ANGLE 1 [deg]	Display the accuracy of calibration.
ANGLE 2 [deg]	Display the command angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 1 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 2 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.
ST ANGLE SENSOR [deg]	Display the steering angle from steering angle sensor via CAN communication.

DIAGNOSIS SYSTEM (STEERING ANGLE MAIN CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks
ANGLE DIFFERENCE [deg]	Display the difference angle between steering wheel and steering pinion.
STEERING PINION ANGLE [deg]	Display the steering pinion angle.
STEERING PINION ANGLE 2 [deg]	Display the steering pinion angle.
ANGLE 3 [deg]	Display the angle information used for system control.

RE/PROGRAMMING, CONFIGURATION

Configuration includes the following functions.

Item	Description
Read/Write Configuration	Before replacing ECU Allows the reading of vehicle specification (Type ID) written in steering angle main control module to store the specification in CONSULT.
	After replacing ECU Allows the writing of vehicle information (Type ID) stored in CONSULT into the steering angle main control module.
Manual Configuration	Allows the writing of vehicle specification (Type ID) into the steering angle main control module by hand.

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DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

CONSULT Function

INFOID:000000011286629

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes as follows.

Diagnostic test mode	Function
ECU Identification	Steering angle sub control module part number can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the steering angle sub control module can be read.
Re/programming. Configuration	<ul style="list-style-type: none">• Read and save the vehicle specification (TYPE ID).• Write the vehicle specification (TYPE ID) when replacing steering angle sub control module.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Steering angle sub control module part number can be read.

SELF DIAGNOSTIC RESULT

Refer to [STC-105, "DTC Index"](#).

When "PRNT" is displayed on self-diagnosis result.

- The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

- System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed.

Freeze Frame Data Item	Description
TOTAL DISTANCE	Display the odometer value from combination meter via CAN communication.
OWN ECU SYS STATUS	Display the status of steering angle sub control module.
ST ANG MAIN SYS STATUS	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS	Display the status of steering angle sub control module.
ST FORCE SYS STATUS	Display the status of steering force control module.
BACK UP CIRCUIT STATUS	Display the status of buck up circuit.
CONTROL MODULE CRNT	Display the electric current value of steering angle sub control module.
DETAILED CODE 1	This is displayed, but it is not used.
DETAILED CODE 2	This is displayed, but it is not used.
DETAILED CODE 3	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS	Display the sync status of FlexRay communication.
STEERING MODE	Display the steering mode.
ST CLUTCH PRTCT STATUS	Display the status of steering clutch.
ST CLUTCH CON RQEST	Display the control request status steering clutch.
FLEXRAY COMM DIAG (OWN)	Display the diagnosis status of FlexRay communication. (steering angle sub control module)
FLEXRAY COMM DIAG (OTH1)	Display the diagnosis status of FlexRay communication. (steering angle main control module)
FLEXRAY COMM DIAG (OTH2)	Display the diagnosis status of FlexRay communication. (steering force control module)
POWER TRAIN STATUS	Display the status of power train.

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Freeze Frame Data Item	Description
IGN SW STATUS (OWN ECU)	Display the ignition voltage status recognized by steering angle sub control module.
IGN SW STATUS (SYSTEM)	Display the status of ignition voltage for direct adaptive steering.
STOP/START STATUS	Display the status of stop/start system from ECM via CAN communication.
INSTANT VLT DROP DETECT	Display the status of instantaneous voltage drop detection.
CURB STONE DETECT STATS	Display the status of curb stone detection.
BACK UP CIRCUIT A STATUS	Display the status of buck up circuit A.
BACK UP CIRCUIT B STATUS	Display the status of buck up circuit B.
FREE ROLLER MODE	Display the status of free roller mode.
CHASSIS DYNAMO MODE	Display the status of chassis dynamometer mode.
WRITING STATUS	Display the status the recorded angle information in steering angle sub control module.
BACK UP SIG 1 VOLT	Display the voltage of buck up signal 1.
BACK UP SIG 2 VOLT	Display the voltage of buck up signal 2.
INVERTER RELAY ACT VOLT	Display the activation voltage of inverter relay.
CONT MODULE INSIDE VOLT	Display the inside voltage of steering angle sub control module.
BATTERY VOLTAGE	Display the power supply voltage for steering angle sub control module.
IGN VOLTAGE	Display the ignition power supply voltage for steering angle sub control module.
C/M TEMPERATURE	Display the internal temperature of steering angle sub control module.
VEHICLE SPEED	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.
YAW RATE	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.
SIDE G	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.
ST CLUTCH ACT CURRENT	Display the activation current of steering clutch.
MOTOR U ACT CURRENT	Display the activation current of steering angle sub motor U phase.
MOTOR W ACT CURRENT	Display the activation current of steering angle sub motor W phase.
TORQUE SEN MAIN 1	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.
TEMPERATURE SENSOR	Display the temperature of steering angle sub control module.
ANGLE SENSOR SIGNAL 1	Display the voltage of angle sensor signal.
ANGLE SENSOR SIGNAL 2	Display the voltage of angle sensor signal.
ANGLE 1	Display the accuracy of calibration.
ANGLE 2	Display the command angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 1	Display the feedback angle for steering angle main motor and steering angle sub motor.
F/B ANGLE 2	Display the feedback angle for steering angle main motor and steering angle sub motor.
ST ANGLE SENSOR	Display the steering angle from steering angle sensor via CAN communication.
ANGLE DIFFERENCE	Display the difference angle between steering wheel and steering pinion.
STEERING PINION ANGLE	Display the steering pinion angle.
STEERING PINION ANGLE 2	Display the steering pinion angle.
ANGLE 3	Display the angle information used for system control.

DATA MONITOR

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

X: Applicable

Monitor item [Unit]	Remarks
OWN ECU SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle sub control module.
ST ANG MAIN SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle main control module.
ST ANG SUB SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering angle sub control module.
ST FORCE SYS STATUS [BOOT/DIAG1/DIAG2/DIAG3/DIAG4/ DIAG5/DIAG6/DIAG7/DIAG8/DIAG9/ DIAG10/DOWN1/DOWN2/DOWN3/FIN1/ FIN2/FIN3/FIN4/FIN5/FIN6/FIN7/FIN8/ FIN9/FIN10/FIN11/FIN12/MALF1/MALF2/ MALF3/SETTING/STD1/STD2/STD3/ SYNC]	Display the status of steering force control module.
BACK UP CIRCUIT STATUS [0 – 255]	Display the status of buck up circuit.
CONTROL MODULE CRNT [A]	Display the electric current value of steering angle sub control module.
DETAILED CODE 1 [0 – 255]	This is displayed, but it is not used.
DETAILED CODE 2 [0 – 255]	This is displayed, but it is not used.
DETAILED CODE 3 [0 – 255]	This is displayed, but it is not used.
FLESRAY COMM SYNC STATS [STAT1/STAT2/STAT3/STAT4/STAT5/ STAT6/STAT7/STAT8/STAT9/STAT10]	Display the sync status of FlexRay communication.
STEERING MODE [CHARA A/CHARA B/CHARA C/CHARA D/ CHARA E/CHARA F/CHARA G/CHARA H/ CHARA I]	Display the steering mode.
ST CLUTCH PRTCT STATUS [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5/STAT6/STAT7/STAT8/STAT9/ STAT10/STAT11/STAT12/STAT20]	Display the status of steering clutch.
ST CLUTCH CON RQEST [STAT0/STAT1/STAT2/STAT3/STAT4/ STAT5]	Display the control request status steering clutch.
FLEXRAY COMM DIAG (OWN) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle sub control module)
FLEXRAY COMM DIAG (OTH1) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering angle main control module)
FLEXRAY COMM DIAG (OTH2) [NORMAL/DIAG/MALF]	Display the diagnosis status of FlexRay communication. (steering force control module)

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Monitor item [Unit]	Remarks	
POWER TRAIN STATUS [STOP/RUN]	Display the status of power train.	A
IGN SW STATUS (OWN ECU) [ON/OFF]	Display the ignition voltage status recognized by steering angle sub control module.	
IGN SW STATUS (SYSTEM) [ON/OFF]	Display the status of ignition voltage for direct adaptive steering.	B
STOP/START STATUS [ON/OFF]	Display the status of stop/start system from ECM via CAN communication.	
INSTANT VLT DROP DETECT [UNDTCT/DETECT]	Display the status of instantaneous voltage drop detection.	C
CURB STONE DETECT STATS [UNDTCT/DETECT]	Display the status of curb stone detection.	
BACK UP CIRCUIT A STATUS [STAT1/STAT2]	Display the status of buck up circuit A.	D
BACK UP CIRCUIT B STATUS [STAT1/STAT2]	Display the status of buck up circuit B.	E
FREE ROLLER MODE [ON/OFF]	Display the status of free roller mode.	
CHASSIS DYNAMO MODE [PERMIT/PROHBT]	Display the status of chassis dynamometer mode.	F
WRITING STATUS [OK/NG]	Display the status the recorded angle information in steering angle sub control module.	
BACK UP SIG 1 VOLT [V]	Display the voltage of buck up signal 1.	STC
BACK UP SIG 2 VOLT [V]	Display the voltage of buck up signal 2.	
INVERTER RELAY ACT VOLT [V]	Display the activation voltage of inverter relay.	
CONT MODULE INSIDE VOLT [V]	Display the inside voltage of steering angle sub control module.	H
BATTERY VOLTAGE [V]	Display the power supply voltage for steering angle sub control module.	
IGN VOLTAGE [V]	Display the ignition power supply voltage for steering angle sub control module.	I
C/M TEMPERATURE [°C] or [°F]	Display the internal temperature of steering angle sub control module.	
VEHICLE SPEED [km/h] or [MPH]	Display the vehicle speed from ABS actuator and electric unit (control unit) via CAN communication.	J
YAW RATE [deg/s]	Display yaw rate value from ABS actuator and electric unit (control unit) via CAN communication.	
SIDE G [m/s ²]	Display side G value from ABS actuator and electric unit (control unit) via CAN communication.	K
ST CLUTCH ACT CURRENT [A]	Display the activation current of steering clutch.	
MOTOR U ACT CURRENT [A]	Display the activation current of steering angle sub motor U phase.	L
MOTOR W ACT CURRENT [A]	Display the activation current of steering angle sub motor W phase.	
TORQUE SEN MAIN 1 [N·m]	Display the steering torque sensor (main 1) value recognized by direct adaptive steering.	
TEMPERATURE SENSOR [°C] or [°F]	Display the temperature of steering angle sub control module.	M
ANGLE SENSOR SIGNAL 1 [V]	Display the voltage of angle sub motor angle sensor signal.	
ANGLE SENSOR SIGNAL 2 [V]	Display the voltage of angle sub motor angle sensor signal.	
ANGLE 1 [deg]	Display the accuracy of calibration.	N
ANGLE 2 [deg]	Display the command angle for steering angle main motor and steering angle sub motor.	
F/B ANGLE 1 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.	O
F/B ANGLE 2 [deg]	Display the feedback angle for steering angle main motor and steering angle sub motor.	
ST ANGLE SENSOR [deg]	Display the steering angle from steering angle sensor via CAN communication.	
ANGLE DIFFERENCE [deg]	Display the difference angle between steering wheel and steering pinion.	P
STEERING PINION ANGLE [deg]	Display the steering pinion angle.	
STEERING PINION ANGLE 2 [deg]	Display the steering pinion angle.	
ANGLE 3 [deg]	Display the angle information used for system control.	

RE/PROGRAMMING, CONFIGURATION

Configuration includes the following functions.

DIAGNOSIS SYSTEM (STEERING ANGLE SUB CONTROL MODULE)

< SYSTEM DESCRIPTION >

[DIRECT ADAPTIVE STEERING]

Item		Description
Read/Write Configuration	Before replacing ECU	Allows the reading of vehicle specification (Type ID) written in steering angle sub control module to store the specification in CONSULT.
	After replacing ECU	Allows the writing of vehicle information (Type ID) stored in CONSULT into the steering angle sub control module.
Manual Configuration		Allows the writing of vehicle specification (Type ID) into the steering angle sub control module by hand.

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

ECU DIAGNOSIS INFORMATION

STEERING FORCE CONTROL MODULE

Reference Value

INFOID:0000000011286630

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Condition	Display value
OWN ECU SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
ST ANG MAIN SYS STATUS	Judging system starting	BOOT
		DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

STC

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value
ST ANG SUB SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
ST FORCE SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
BACK UP CIRCUIT STATUS	Always	0 – 255
CONTROL MODULE CRNT	Always	0 – 255 A
DETAILED CODE 1	This is displayed, but it is not used.	0 – 255
DETAILED CODE 2	This is displayed, but it is not used.	0 – 255
DETAILED CODE 3	This is displayed, but it is not used.	0 – 255
FLEXRAY COMM SYNC STATS	Always	STAT1 – 10
STEERING MODE	Always	CHARA – CHARA I
ST CLUTCH PRTCT STATUS	Always	STAT0 – STAT12, STAT20
ST CLUTCH CON RQEST	Always	STAT0 – STAT5

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value			
SHIFT POSITION	Engine running	Idle neutral is active	IDLE	A	
		Shift selector: Manual mode	1ST	1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH	B
			2ND		C
			3RD		D
			4TH		E
			5TH		F
			6TH		G
			7TH		H
8TH	I				
FLEXRAY COMM DIAG (OWN)	FlexRay communication of steering force control module is normal.	NORMAL	F		
	FlexRay communication of steering force control module is being diagnosed.	DIAG	G		
	FlexRay communication of steering force control module is malfunction.	MALF	STC		
	FLEXRAY COMM DIAG (OTH1)	FlexRay communication of steering angle main control module is normal.	NORMAL	H	
		FlexRay communication of steering angle main control module is being diagnosed.	DIAG	I	
		FlexRay communication of steering angle main control module is malfunction.	MALF	J	
		FLEXRAY COMM DIAG (OTH2)	FlexRay communication of steering angle sub control module is normal.	NORMAL	K
FlexRay communication of steering angle sub control module is being diagnosed.	DIAG		L		
FlexRay communication of steering angle sub control module is malfunction.	MALF		M		
POWER TRAIN STATUS	Power train stops.	STOP	N		
	Power train starts.	RUN	O		
IGN SW STATUS (OWN ECU)	Ignition switch: ON	Control module detects ignition voltage.	ON	P	
		Control module does not detect ignition voltage.	OFF	Q	
IGN SW STATUS (SYSTEM)	Ignition switch: ON	Control module detects ignition voltage.	ON	R	
		Control module does not detect ignition voltage.	OFF	S	
STOP/START STATUS	Stop/start system is operating.	ON	T		
	Stop/start system is not operating.	OFF	U		
INSTANT VLT DROP DETECT	Instantaneous voltage drop status is not detected.	UNDTCT	V		
	Instantaneous voltage drop status is detected.	DETECT	W		
CURB STONE DETECT STATS	The state of hitting curb stone is not detected.	UNDTCT	X		
	The state of hitting curb stone is detected.	DETECT	Y		
BACK UP CIRCUIT A STATUS	System is abnormal.	STAT1	Z		
	System is normal.	STAT2	AA		

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
BACK UP CIRCUIT B STATUS	System is abnormal.		STAT1
	System is normal.		STAT2
FREE ROLLER MODE	Free roller mode: ON		ON
	Free roller mode: OFF		OFF
CHASSIS DYNAMO MODE	Engine running	System is normal mode (Driving is OK)	PERMIT
		System is chassis dynamometer mode (Driving is NG)	PROHBT
WRITING STATUS	When system is starting, the required angle information is recorded in control module.		OK
	When system is starting, the required angle information is not recorded in control module.		NG
BACK UP SIG 1 VOLT	Ignition switch ON	When steering force control module is normal.	Approx. 0 – 5 V
BACK UP SIG 2 VOLT	Ignition switch ON	When steering force control module is normal.	Approx. 0 – 5 V
INVERTER RELAY ACT VOLT	Engine running		Battery voltage
CONT MODULE INSIDE VOLT	Engine running		Battery voltage – Approx. 0.6 V
BATTERY VOLTAGE	Ignition switch ON		Battery voltage
IGN VOLTAGE	Ignition switch ON		Battery voltage
C/M TEMPERATURE	Engine running		Display temperature of inside of steering force motor [°C °F]
VEHICLE SPEED	Vehicle stopped		0.00 km/h or 0.00 MPH
	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 ±10%)
YAW RATE	Vehicle stopped		Approx. 0 deg/s
	Vehicle turning		Approx. 0 - ±201 deg/s
SIDE G	Vehicle stopped		Approx. 0 m/s ²
	Vehicle turning		Approx. 0 - ±2 m/s ²
ST CLUTCH ACT CURRENT	Engine running		Approx. 0 – 5 A
MOTOR U ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
MOTOR W ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
TORQUE SEN MAIN 1	Engine running		Approx. (-8.5) – 8.5 N·m
TEMPERATURE SENSOR	Ignition switch ON or Engine running		Approx. [-40°C (-40°F) – 160°F (320°F)]
ENGINE SPEED	Engine stopped		0 Tr/min
	Engine running		Display the engine speed (Tr/min)
ANGLE SENSOR SIGNAL 1	Engine running		Approx. 1.0 - 3.5 V

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
ANGLE SENSOR SIGNAL 2	Engine running		Approx. 1.0 - 3.5 V
ANGLE 1	Engine running		Approx. (-4.4) – 4.4 deg
ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
F/B ANGLE 1	Engine running		Approx. (-20) – 20 deg
F/B ANGLE 2	Engine running		Approx. (-6) – 6 deg
ST ANGLE SENSOR	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 900 deg)
		Steering wheel: Left turn	Negative vale [Approx. (-900) – 0 deg]
ANGLE DIFFERENCE	Engine running		Approx. 0 – 300 deg
STEERING PINION ANGLE	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (-550) – 0 deg]
STEERING PINION ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (-550) – 0 deg]
ANGLE 3	Engine running		Approx. (-7425) – 7425 deg

Fail-safe

INFOID:000000011286631

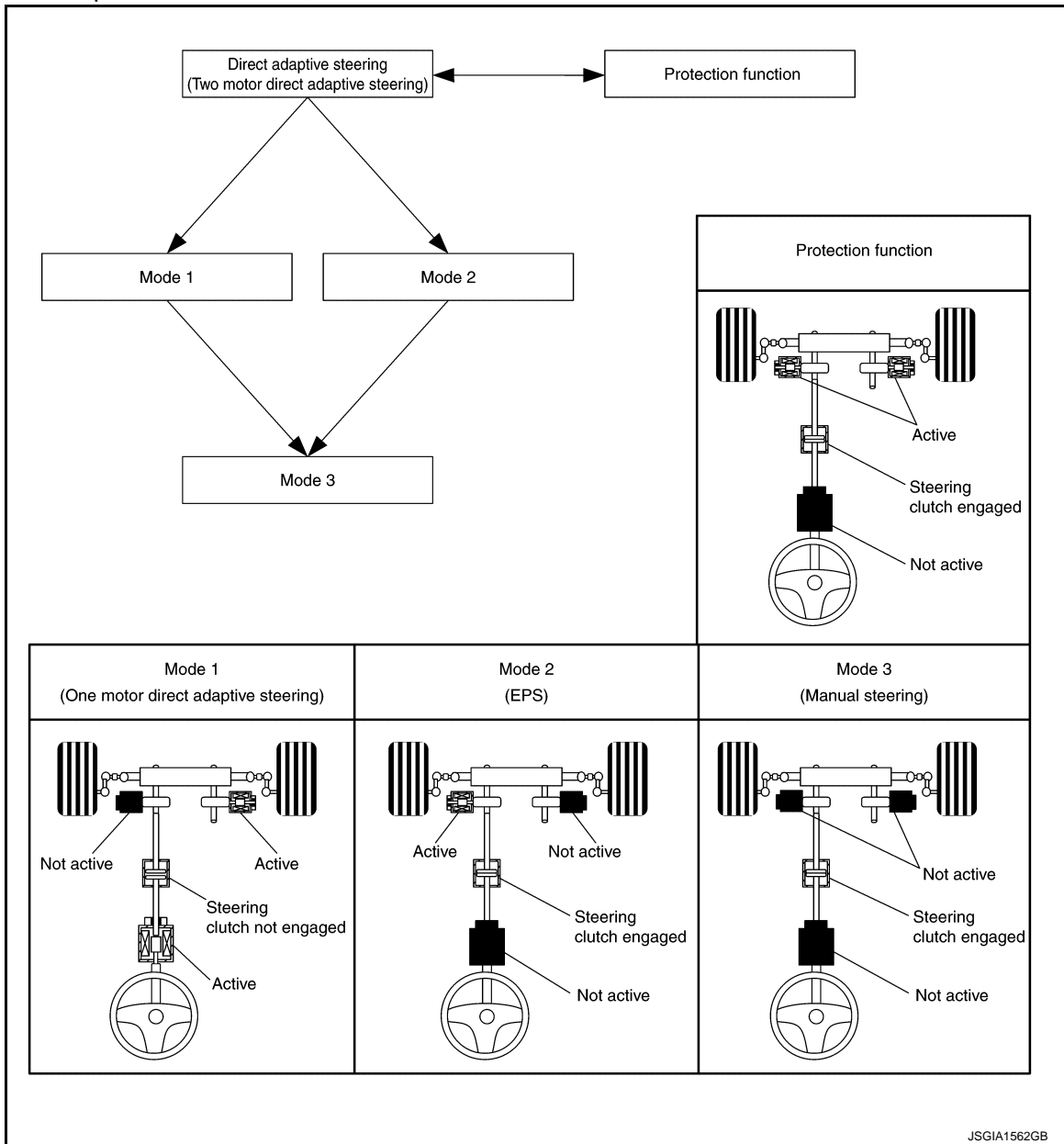
- If a malfunction occurs in the system, the fail-safe function stops the system (mode 3), activates the fail-safe mode (mode 1 or mode 2) or activates the protection mode. When the system enters mode 1, mode 2 or mode 3, the power steering warning lamp illuminates to inform the driver that the turning force is heavy in effect.
- Since three control modules monitor malfunctions mutually, DTC code varies from control module to control module.

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

- For details of protection function, refer to [STC-76. "Protection Function"](#).



DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13A0-00	Variable	Variable	Variable
C13A1-00	—	Mode 2	Mode 2
C13A2-00	Mode 1 or Mode 3	Mode 1 or Mode 3	Mode 1 or Mode 3
C13A3-00	Mode 2	Mode 2	Mode 2
C13A4-00	—	Mode 2	Mode 2
C13A5-00	—	—	Mode 2
C13A6-00	—	Mode 3	—
C13A7-00	—	Mode 3	—
C13A8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13A9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AA-00	Mode 2	Mode 3	Mode 2

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPIVE STEERING]

DTC	Relation between control module detecting DTC and system status			
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC	
C13AB-00	Mode 2	Mode 3	Mode 2	A
C13AC-00	—	Mode 3	—	B
C13AD-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13AE-00	Mode 2	Mode 3	Mode 2	C
C13AF-00	Mode 2	Mode 3	Mode 2	
C13B0-00	Mode 2	Mode 3	Mode 2	D
C13B1-00	Mode 2	Mode 3	Mode 2	
C13B2-00	Mode 2	Mode 1 or Mode 3	Mode 2	E
C13B3-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B4-00	Mode 2	Mode 3	Mode 2	F
C13B5-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B6-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B7-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B8-00	Mode 2	Mode 1 or Mode 3	Mode 2	STC
C13B9-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13BA-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13BB-00	—	—	—	H
C13BC-00	—	—	—	
C13BD-00	—	Mode 2	—	I
C13BE-00	Mode 2	Mode 2	Mode 2	
C13BF-00	Variable	Variable	Variable	
C13C0-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3	J
C13C1-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3	
C13C2-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3	K
C13C3-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3	
C13C4-00	Mode 2	Mode 1 or Mode 3	Mode 2	L
C13C5-00	Mode 2	—	—	
C13C6-00	Mode 2	—	—	
C13C7-00	Mode 2	—	—	M
C13C8-00	—	—	—	
C13C9-00	—	—	—	
C13CA-00	—	—	—	N
C13CB-00	—	—	—	
C13CC-00	—	—	—	
C13CD-00	—	—	—	O
C13CE-00	—	—	—	
C13CF-00	—	—	—	P
C13D0-00	—	—	—	
C13D1-00	—	—	—	
C13D2-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13D3-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13D4-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13D5-00	Mode 2	Mode 1 or Mode 3	Mode 2	

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13D6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D8-00	—	—	—
C13D9-00	—	—	—
C13DA-00	—	—	—
C13DB-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DC-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DD-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DE-00	Protection function mode	Protection function mode	Protection function mode
C13DF-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13E0-00	Mode 2	—	—
C13E1-00	Mode 2	—	—
C13E2-00	—	—	—
C13E3-00	Protection function mode	—	—
C13E4-00	Protection function mode	—	—
C13E5-00	Mode 2	—	—
C13E6-00	Protection function mode	Protection function mode	Protection function mode
C13E7-00	Protection function mode	Protection function mode	Protection function mode
C13E8-00	Protection function mode	Protection function mode	Protection function mode
C13E9-00	—	Mode 2	—
C13EA-00	Mode 2	—	—
C13EB-00	—	Mode 2	Mode 2
C13EE-00	Mode 3	Mode 3	Mode 3
C13EF-00	Mode 3	Mode 3	Mode 3
C13F0-00	Mode 2	Mode 2	Mode 2
C13F1-00	Mode 2	—	—
C13F2-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
U1000-01	—	—	—
U1010-49	—	—	—

- *1: When control module detects a malfunction at startup.
- *2: When control module detects a malfunction except during startup.

Protection Function

INFOID:0000000011286632

- When battery voltage malfunctions temporarily, system overheats continuously and system is overloaded continuously, system is in protection mode temporarily. This is not malfunction.
- When a causative condition is cleared, the system returns to normal control automatically. (Except C13E5-00)
- Since the protection function condition is not malfunction, power steering warning lamp does not turn ON. (Except C13E5-00) The following DTCs remain to distinguish from malfunction.

STEERING FORCE CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Condition	Vehicle condition
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering operation may become heavy temporarily, however steering wheel can be operated without interference. This is not a system malfunction.)
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.	
C13E5-00	When steering clutch is released, steering clutch is not released in spite of trying to release it many times with overloading steering wheel.	
C13E6-00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more. DAST 1, DAST 2: Internal temperature of control module is 90°C (194°F) or more.	
C13E7-00	Power supply voltage of control module is low temporarily.	
C13E8-00	<ul style="list-style-type: none"> Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. Steering gear is out of neutral position. (Large) 	

A
B
C
D
E
F
STC

DTC Inspection Priority Chart

INFOID:000000011286633

When multiple DTCs are detected simultaneously, check one by one depending on the following priority list.

Priority	Priority order item (DTC)
1	<ul style="list-style-type: none"> C13C5-00 STEERING ANGLE SENSOR SIGNAL C13C6-00 G SENSOR SIGNAL C13C7-00 VEHICL SPEED SIGNAL C13C9-00 DRIVE MODE SIGNAL C13CA-00 ENGINE STATUS SIGNAL C13CC-00 T/M GEAR POSI SIGNAL C13CD-00 ENGINE SPEED SIGNAL C13CE-00 SLEEP/WAKEUP SIGNAL C13CF-00 ALC FUNCTION REQUEST SIGNAL C13D0-00 ALC FUNCTION REQUEST SIGNAL C13D1-00 STEERING ANGLE SENSOR SIGNAL U1000-01 CAN COMM CIRCUIT U1010-49 CONTROL UNIT (CAN)
2	<ul style="list-style-type: none"> C13E9-00 BOOTING ANGLE PROCESSING C13EA-00 BOOTING ANGLE PROCESSING C13EB-00 BOOTING ANGLE PROCESSING C13EE-00 INCOMP CONFIG C13EF-00 CONFIG CHECK RESULT C13F0-00 IMCOMP DAST CALIBRATION C13F1-00 INCOMP ST ANG SEN ADJST C13F2-00 DIFFERENT SOFTWARE VERSION

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Priority	Priority order item (DTC)
3	<ul style="list-style-type: none"> • C13A8-00 BACK UP CIRCUIT • C13A9-00 BACK UP CIRCUIT • C13AB-00 CONTROL MODULE • C13AC-00 CONTROL MODULE • C13B6-00 MOTOR CIRCUIT • C13B9-00 CONTROL MODULE • C13BB-00 CONTROL MODULE POWER SUPPLY • C13BC-00 CONTROL MODULE IGN POWER SUP • C13BD-00 CONTROL MODULE IGN POWER SUP • C13D4-00 CONTROL MODULE • C13D8-00 CONTROL MODULE • C13DB-00 STEERING TORQUE SENSOR • C13DC-00 STEERING TORQUE SENSOR • C13DD-00 STEERING TORQUE SENSOR • C13DE-00 TEMPERATURE SENSOR • C13E0-00 ST CLUTCH COMMAND CIRCUIT • C13E1-00 STEERING CLUTCH • C13E2-00 FRONT WHEEL SENSOR SIGNAL
4	<ul style="list-style-type: none"> • C13BE-00 FLEXRAY COMMUNICATION • C13BF-00 FLEXRAY COMMUNICATION • C13C0-00 FLEXRAY COMMUNICATION • C13C1-00 FLEXRAY COMMUNICATION • C13C2-00 FLEXRAY COMMUNICATION • C13C3-00 FLEXRAY COMMUNICATION • C13C4-00 FLEXRAY COMMUNICATION
5	<ul style="list-style-type: none"> • C13A0-00 CONTROL MODULE • C13A1-00 CONTROL MODULE • C13A2-00 CONTROL MODULE • C13A3-00 CONTROL MODULE • C13A4-00 CONTROL MODULE • C13A5-00 CONTROL MODULE • C13A6-00 CONTROL MODULE • C13A7-00 CONTROL MODULE • C13AA-00 CONTROL MODULE • C13AD-00 CONTROL MODULE • C13AE-00 CONTROL MODULE • C13AF-00 CONTROL MODULE • C13B0-00 CONTROL MODULE • C13B1-00 CONTROL MODULE • C13B2-00 CONTROL MODULE • C13B3-00 CONTROL MODULE • C13B4-00 CONTROL MODULE • C13B5-00 CONTROL MODULE • C13B7-00 CONTROL MODULE • C13B8-00 CONTROL MODULE • C13BA-00 CONTROL MODULE POWER SUPPLY • C13D2-00 CONTROL MODULE • C13D3-00 CONTROL MODULE • C13D5-00 CONTROL MODULE • C13D6-00 CONTROL MODULE • C13D7-00 CONTROL MODULE • C13D9-00 CONTROL MODULE • C13DF-00 CONTROL MODULE
6	<ul style="list-style-type: none"> • C13E3-00 SPIRAL CABLE PROTECTION • C13E4-00 ST CLUTCH RELEASE PROTECTION • C13E5-00 ST CLUTCH RELEASE PROTECTION • C13E6-00 HEAT PROTECTION • C13E7-00 LOW VOLTAGE PROTECTION • C13E8-00 CURB STONE PROTECTION

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[DIRECT ADAPTIVE STEERING]

DTC Index

INFOID:0000000011286634

x: Applicable

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13A0-00	CONTROL MODULE	x	x	x	ON	STC-136
C13A1-00	CONTROL MODULE	x	x	x	OFF	STC-139
C13A2-00	CONTROL MODULE	x	x	x	ON	STC-142
C13A3-00	CONTROL MODULE	x	x	x	ON	STC-145
C13A4-00	CONTROL MODULE		x	x	OFF	—
C13A5-00	CONTROL MODULE			x	OFF	—
C13A6-00	CONTROL MODULE		x		OFF	—
C13A7-00	CONTROL MODULE		x		OFF	—
C13A8-00	BACK UP CIRCUIT	x	x	x	ON	STC-154
C13A9-00	BACK UP CIRCUIT	x	x	x	ON	STC-159
C13AA-00	CONTROL MODULE	x	x	x	ON	STC-164
C13AB-00	CONTROL MODULE	x	x	x	ON	STC-167
C13AC-00	CONTROL MODULE		x		OFF	—
C13AD-00	CONTROL MODULE	x	x	x	ON	STC-173
C13AE-00	CONTROL MODULE	x	x	x	ON	STC-177
C13AF-00	CONTROL MODULE	x	x	x	ON	STC-180
C13B0-00	CONTROL MODULE	x	x	x	ON	STC-183
C13B1-00	CONTROL MODULE	x	x	x	ON	STC-186
C13B2-00	CONTROL MODULE	x	x	x	ON	STC-189
C13B3-00	CONTROL MODULE	x	x	x	ON	STC-193
C13B4-00	CONTROL MODULE	x	x	x	ON	STC-196
C13B5-00	CONTROL MODULE	x	x	x	ON	STC-199
C13B6-00	MOTOR CIRCUIT	x	x	x	ON	STC-202
C13B7-00	CONTROL MODULE	x	x	x	ON	STC-208
C13B8-00	CONTROL MODULE	x	x	x	ON	STC-211
C13B9-00	CONTROL MODULE	x	x	x	ON	STC-214
C13BA-00	CONTROL MODULE POWER SUPPLY	x	x	x	ON	STC-220
C13BB-00	CONTROL MODULE POWER SUPPLY	x	x	x	OFF	STC-225
C13BC-00	CONTROL MODULE IGN POWER SUP	x	x	x	OFF	STC-230
C13BD-00	CONTROL MODULE IGN POWER SUP		x		OFF	—
C13BE-00	FLEXRAY COMMUNICATION	x	x	x	ON	STC-235
C13BF-00	FLEXRAY COMMUNICATION	x	x	x	ON	STC-240
C13C0-00	FLEXRAY COMMUNICATION	x	x	x	ON	STC-246

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[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13C1-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-258
C13C2-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-262
C13C3-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-273
C13C4-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-282
C13C5-00	STEERING ANGLE SENSOR SIGNAL	×			ON	STC-286
C13C6-00	G SENSOR SIGNAL	×			ON	STC-288
C13C7-00	VEHICL SPEED SIGNAL	×			ON	STC-290
C13C9-00	DRIVE MODE SIGNAL	×			OFF	STC-292
C13CA-00	ENGINE STATUS SIGNAL	×			OFF	STC-293
C13CC-00	T/M GEAR POSI SIGNAL	×			OFF	STC-294
C13CD-00	ENGINE SPEED SIGNAL	×			OFF	STC-295
C13CE-00	SLEEP/WAKE UP SIGNAL	×			OFF	STC-296
C13CF-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	—
C13D0-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	—
C13D1-00	STEERING ANGLE SENSOR SIGNAL		×		ON	—
C13D2-00	CONTROL MODULE	×	×	×	ON	STC-301
C13D3-00	CONTROL MODULE	×	×	×	ON	STC-304
C13D4-00	CONTROL MODULE	×	×	×	ON	STC-307
C13D5-00	CONTROL MODULE	×	×	×	ON	STC-313
C13D6-00	CONTROL MODULE	×	×	×	ON	STC-316
C13D7-00	CONTROL MODULE	×	×	×	ON	STC-319
C13D8-00	CONTROL MODULE	×	×		OFF	STC-322
C13D9-00	CONTROL MODULE	×	×		OFF	STC-326
C13DB-00	STEERING TORQUE SENSOR		×		OFF	—
C13DC-00	STEERING TORQUE SENSOR		×		OFF	—
C13DD-00	STEERING TORQUE SENSOR		×		OFF	—
C13DE-00	TEMPERATURE SENSOR	×	×	×	OFF	STC-337
C13DF-00	CONTROL MODULE		×		OFF	—
C13E0-00	ST CLUTCH COMMAND CIRCUIT	×			ON	STC-343
C13E1-00	STEERING CLUTCH	×			ON	STC-345
C13E2-00	FRONT WHEEL SENSOR SIGNAL	×			OFF	STC-347
C13E3-00	SPIRAL CABLE PROTECTION	×			OFF	STC-348
C13E4-00	ST CLUTCH RELEASE PROTECTION	×			OFF	STC-349
C13E5-00	ST CLUTCH RELEASE PROTECTION	×			ON	STC-352
C13E6-00	HEAT PROTECTION	×	×	×	OFF	STC-355

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[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13E7-00	LOW VOLTAGE PROTECTION	×	×	×	OFF	STC-361
C13E8-00	CURB STONE PROTECTION	×	×	×	OFF	STC-366
C13E9-00	BOOTING ANGLE PROCESSING		×		OFF	—
C13EA-00	BOOTING ANGLE PROCESSING	×			ON	STC-372
C13EB-00	BOOTING ANGLE PROCESSING		×	×	OFF	—
C13EE-00	INCOMP CONFIG	×	×	×	ON	STC-377
C13EF-00	CONFIG CHECK RESULT	×	×	×	ON	STC-381
C13F0-00	INCOMP DAST CALIBRATION	×	×	×	ON	STC-385
C13F1-00	INCOMP ST ANG SEN ADJST	×			ON	STC-388
C13F2-00	DIFFERENT SOFTWARE VERSION	×	×	×	ON	STC-390
U1000-01	CAN COMM CIRCUIT	×	×		OFF	STC-393
U1010-49	CONTROL UNIT (CAN)	×	×		OFF	STC-395

NOTE:

If two or more DTCs are detected, refer to [STC-77, "DTC Inspection Priority Chart"](#).

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STEERING ANGLE MAIN CONTROL MODULE

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[DIRECT ADAPTIVE STEERING]

STEERING ANGLE MAIN CONTROL MODULE

Reference Value

INFOID:0000000011286635

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Condition	Display value
OWN ECU SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
	ST ANG MAIN SYS STATUS	Judging system starting
System is diagnosing		DIAG1 – DIAG10
Processing system shutdown		FIN1 – FIN12
Finish the system control		DOWN1
Wait for shutdown		DOWN2
System is shutdown		DOWN3
System is in fail-safe mode 1		MALF1
System is in fail-safe mode 2		MALF2
System is in fail-safe mode 3		MALF3
Performing initial setting		SETTING
System is in normal control		STD1 STD2
System is in protection mode		STD3
System is synchronizing		SYNC

STEERING ANGLE MAIN CONTROL MODULE

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[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value	
ST ANG SUB SYS STATUS	Judging system starting	BOOT	A
	System is diagnosing	DIAG1 – DIAG10	
	Processing system shutdown	FIN1 – FIN12	B
	Finish the system control	DOWN1	
	Wait for shutdown	DOWN2	
	System is shutdown	DOWN3	C
	System is in fail-safe mode 1	MALF1	
	System is in fail-safe mode 2	MALF2	D
	System is in fail-safe mode 3	MALF3	
	Performing initial setting	SETTING	
	System is in normal control	STD1 STD2	E
	System is in protection mode	STD3	
	System is synchronizing	SYNC	F
ST FORCE SYS STATUS	Judging system starting	BOOT	
	System is diagnosing	DIAG1 – DIAG10	STC
	Processing system shutdown	FIN1 – FIN12	
	Finish the system control	DOWN1	
	Wait for shutdown	DOWN2	H
	System is shutdown	DOWN3	
	System is in fail-safe mode 1	MALF1	
	System is in fail-safe mode 2	MALF2	I
	System is in fail-safe mode 3	MALF3	
	Performing initial setting	SETTING	J
	System is in normal control	STD1 STD2	
	System is in protection mode	STD3	K
	System is synchronizing	SYNC	
BACK UP CIRCUIT STATUS	Always	0 – 255	L
CONTROL MODULE CRNT	Always	0 – 255 A	
DETAILED CODE 1	This is displayed, but it is not used.	0 – 255	
DETAILED CODE 2	This is displayed, but it is not used.	0 – 255	M
DETAILED CODE 3	This is displayed, but it is not used.	0 – 255	
FLEXRAY COMM SYNC STATS	Always	STAT1 – 10	N
STEERING MODE	Always	CHARA – CHARA I	
ST CLUTCH PRTCT STATUS	Always	STAT0 – STAT12, STAT20	O
ST CLUTCH CON RQUEST	Always	STAT0 – STAT5	
FLEXRAY COMM DIAG (OWN)	FlexRay communication of steering angle main control module is normal.	NORMAL	
	FlexRay communication of steering angle main control module is being diagnosed.	DIAG	P
	FlexRay communication of steering angle main control module is malfunction.	MALF	

STEERING ANGLE MAIN CONTROL MODULE

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[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
FLEXRAY COMM DIAG (OTH1)	FlexRay communication of steering angle sub control module is normal.		NORMAL
	FlexRay communication of steering angle sub control module is being diagnosed.		DIAG
	FlexRay communication of steering angle sub control module is malfunction.		MALF
FLEXRAY COMM DIAG (OTH2)	FlexRay communication of steering force control module is normal.		NORMAL
	FlexRay communication of steering force control module is being diagnosed.		DIAG
	FlexRay communication of steering force control module is malfunction.		MALF
POWER TRAIN STATUS	Power train stops.		STOP
	Power train starts.		RUN
IGN SW STATUS (OWN ECU)	Ignition switch: ON	Control module detects ignition voltage.	ON
		Control module does not detect ignition voltage.	OFF
IGN SW STATUS (SYSTEM)	Ignition switch: ON	Control module detects ignition voltage.	ON
		Control module does not detect ignition voltage.	OFF
STOP/START STATUS	Stop/start system is operating.		ON
	Stop/start system is not operating.		OFF
INSTANT VLT DROP DETECT	Instantaneous voltage drop status is not detected.		UNDTCT
	Instantaneous voltage drop status is detected.		DETECT
CURB STONE DETECT STATS	The state of hitting curb stone is not detected.		UNDTCT
	The state of hitting curb stone is detected.		DETECT
BACK UP CIRCUIT A STATUS	System is abnormal.		STAT1
	System is normal.		STAT2
BACK UP CIRCUIT B STATUS	System is abnormal.		STAT1
	System is normal.		STAT2
FREE ROLLER MODE	Free roller mode: ON		ON
	Free roller mode: OFF		OFF
CHASSIS DYNAMO MODE	Engine running	System is normal mode (Driving is OK)	PERMIT
		System is chassis dynamometer mode (Driving is NG)	PROHBT
WRITING STATUS	When system is starting, the required angle information is recorded in control module.		OK
	When system is starting, the required angle information is not recorded in control module.		NG
BACK UP SIG 1 VOLT	Ignition switch ON	When steering angle main control module is normal.	Approx. 0 – 5 V
BACK UP SIG 2 VOLT	Ignition switch ON	When steering angle main control module is normal.	Approx. 0 – 5 V
INVERTER RELAY ACT VOLT	Engine running		Battery voltage
CONT MODULE INSIDE VOLT	Engine running		Battery voltage – Approx. 0.6 V
BATTERY VOLTAGE	Ignition switch ON		Battery voltage

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
IGN VOLTAGE	Ignition switch ON		Battery voltage
C/M TEMPERATURE	Engine running		Display temperature of inside of steering angle main control module [°C °F]
VEHICLE SPEED	Vehicle stopped		0.00 km/h or 0.00 MPH
	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 ±10%)
YAW RATE	Vehicle stopped		Approx. 0 deg/s
	Vehicle turning		Approx. 0 - ±201 deg/s
SIDE G	Vehicle stopped		Approx. 0 m/s ²
	Vehicle turning		Approx. 0 - ±2 m/s ²
ST CLUTCH ACT CURRENT	Engine running		Approx. 0 – 5 A
MOTOR U ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
MOTOR W ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
TORQUE SEN MAIN 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
		Steering wheel: Right turn	Approx. 1.4 - 2.5 V
		Steering wheel: Left turn	Approx. 2.5 - 3.6 V
TORQUE SEN MAIN 1	Engine running		Approx. (-8.5) – 8.5 N·m
TORQUE SEN SUB	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
		Steering wheel: Right turn	Approx. 1.4 - 2.5 V
		Steering wheel: Left turn	Approx. 2.5 - 3.6 V
TORQUE SEN VOLTAGE	Ignition switch ON		Approx. 4.5 – 5.5 V
TEMPERATURE SENSOR	Ignition switch ON or Engine running		Display temperature of inside of steering angle main control module [°C °F]
SUB IGN VOLTAGE	Ignition switch ON		Battery voltage
ANGLE SENSOR SIGNAL 1	Engine running		Approx. 1.0 - 3.5 V
ANGLE SENSOR SIGNAL 2	Engine running		Approx. 1.0 - 3.5 V
ANGLE 1	Engine running		Approx. (-4.4) – 4.4 deg
ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
F/B ANGLE 1	Engine running		Approx. (-20) – 20 deg
F/B ANGLE 2	Engine running		Approx. (-6) – 6 deg

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[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
ST ANGLE SENSOR	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 900 deg)
		Steering wheel: Left turn	Negative vale [Approx. (–900) – 0 deg]
ANGLE DIFFERENCE	Engine running		Approx. 0 – 300 deg
STEERING PINION ANGLE	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (–550) – 0 deg]
STEERING PINION ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (–550) – 0 deg]
ANGLE 3	Engine running		Approx. (–7425) – 7425 deg

Fail-safe

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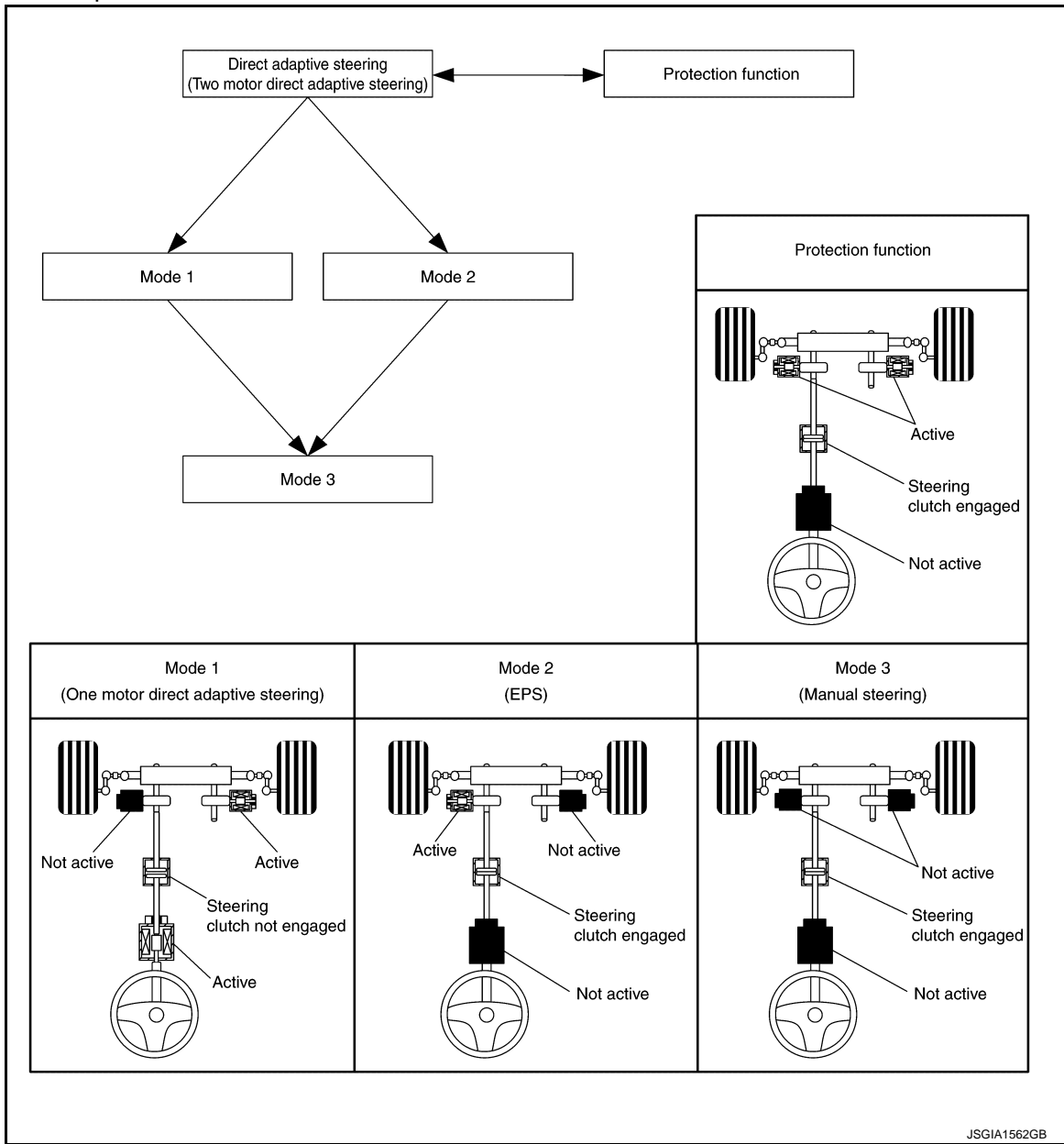
- If a malfunction occurs in the system, the fail-safe function stops the system (mode 3), activates the fail-safe mode (mode 1 or mode 2) or activates the protection mode. When the system enters mode 1, mode 2 or mode 3, the power steering warning lamp illuminates to inform the driver that the turning force is heavy in effect.
- Since three control modules monitor malfunctions mutually, DTC code varies from control module to control module.

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPIVE STEERING]

- For details of protection function, refer to [STC-89. "Protection Function"](#).



DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13A0-00	Variable	Variable	Variable
C13A1-00	—	Mode 2	Mode 2
C13A2-00	Mode 1 or Mode 3	Mode 1 or Mode 3	Mode 1 or Mode 3
C13A3-00	Mode 2	Mode 2	Mode 2
C13A4-00	—	Mode 2	Mode 2
C13A5-00	—	—	Mode 2
C13A6-00	—	Mode 3	—
C13A7-00	—	Mode 3	—
C13A8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13A9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AA-00	Mode 2	Mode 3	Mode 2

STEERING ANGLE MAIN CONTROL MODULE

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[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13AB-00	Mode 2	Mode 3	Mode 2
C13AC-00	—	Mode 3	—
C13AD-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AE-00	Mode 2	Mode 3	Mode 2
C13AF-00	Mode 2	Mode 3	Mode 2
C13B0-00	Mode 2	Mode 3	Mode 2
C13B1-00	Mode 2	Mode 3	Mode 2
C13B2-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B3-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B4-00	Mode 2	Mode 3	Mode 2
C13B5-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13B9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13BA-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13BB-00	—	—	—
C13BC-00	—	—	—
C13BD-00	—	Mode 2	—
C13BE-00	Mode 2	Mode 2	Mode 2
C13BF-00	Variable	Variable	Variable
C13C0-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
C13C1-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C2-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C3-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3
C13C4-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13C5-00	Mode 2	—	—
C13C6-00	Mode 2	—	—
C13C7-00	Mode 2	—	—
C13C8-00	—	—	—
C13C9-00	—	—	—
C13CA-00	—	—	—
C13CB-00	—	—	—
C13CC-00	—	—	—
C13CD-00	—	—	—
C13CE-00	—	—	—
C13CF-00	—	—	—
C13D0-00	—	—	—
C13D1-00	—	—	—
C13D2-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D3-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D4-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D5-00	Mode 2	Mode 1 or Mode 3	Mode 2

STEERING ANGLE MAIN CONTROL MODULE

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[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13D6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D8-00	—	—	—
C13D9-00	—	—	—
C13DA-00	—	—	—
C13DB-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DC-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DD-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DE-00	Protection function mode	Protection function mode	Protection function mode
C13DF-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13E0-00	Mode 2	—	—
C13E1-00	Mode 2	—	—
C13E2-00	—	—	—
C13E3-00	Protection function mode	—	—
C13E4-00	Protection function mode	—	—
C13E5-00	Mode 2	—	—
C13E6-00	Protection function mode	Protection function mode	Protection function mode
C13E7-00	Protection function mode	Protection function mode	Protection function mode
C13E8-00	Protection function mode	Protection function mode	Protection function mode
C13E9-00	—	Mode 2	—
C13EA-00	Mode 2	—	—
C13EB-00	—	Mode 2	Mode 2
C13EE-00	Mode 3	Mode 3	Mode 3
C13EF-00	Mode 3	Mode 3	Mode 3
C13F0-00	Mode 2	Mode 2	Mode 2
C13F1-00	Mode 2	—	—
C13F2-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
U1000-01	—	—	—
U1010-49	—	—	—

- *1: When control module detects a malfunction at startup.
- *2: When control module detects a malfunction except during startup.

Protection Function

INFOID:0000000011286637

- When battery voltage malfunctions temporarily, system overheats continuously and system is overloaded continuously, system is in protection mode temporarily. This is not malfunction.
- When a causative condition is cleared, the system returns to normal control automatically. (Except C13E5-00)
- Since the protection function condition is not malfunction, power steering warning lamp does not turn ON. (Except C13E5-00) The following DTCs remain to distinguish from malfunction.

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Condition	Vehicle condition
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering operation may become heavy temporarily, however steering wheel can be operated without interference. This is not a system malfunction.)
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.	
C13E5-00	When steering clutch is released, steering clutch is not released in spite of trying to release it many times with overloading steering wheel.	
C13E6-00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more. DAST 1, DAST 2: Internal temperature of control module is 90°C (194°F) or more.	
C13E7-00	Power supply voltage of control module is low temporarily.	
C13E8-00	<ul style="list-style-type: none"> Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. Steering gear is out of neutral position. (Large) 	System changes to the protection mode temporarily. (Steering operation may become heavy temporarily, however steering wheel can be operated without interference. This is not a system malfunction.)

DTC Inspection Priority Chart

INFOID:000000011286638

When multiple DTCs are detected simultaneously, check one by one depending on the following priority list.

Priority	Priority order item (DTC)
1	<ul style="list-style-type: none"> C13C5-00 STEERING ANGLE SENSOR SIGNAL C13C6-00 G SENSOR SIGNAL C13C7-00 VEHICL SPEED SIGNAL C13C9-00 DRIVE MODE SIGNAL C13CA-00 ENGINE STATUS SIGNAL C13CC-00 T/M GEAR POSI SIGNAL C13CD-00 ENGINE SPEED SIGNAL C13CE-00 SLEEP/WAKEUP SIGNAL C13CF-00 ALC FUNCTION REQUEST SIGNAL C13D0-00 ALC FUNCTION REQUEST SIGNAL C13D1-00 STEERING ANGLE SENSOR SIGNAL U1000-01 CAN COMM CIRCUIT U1010-49 CONTROL UNIT (CAN)
2	<ul style="list-style-type: none"> C13E9-00 BOOTING ANGLE PROCESSING C13EA-00 BOOTING ANGLE PROCESSING C13EB-00 BOOTING ANGLE PROCESSING C13EE-00 INCOMP CONFIG C13EF-00 CONFIG CHECK RESULT C13F0-00 IMCOMP DAST CALIBRATION C13F1-00 INCOMP ST ANG SEN ADJST C13F2-00 DIFFERENT SOFTWARE VERSION

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Priority	Priority order item (DTC)	
3	<ul style="list-style-type: none"> • C13A8-00 BACK UP CIRCUIT • C13A9-00 BACK UP CIRCUIT • C13AB-00 CONTROL MODULE • C13AC-00 CONTROL MODULE • C13B6-00 MOTOR CIRCUIT • C13B9-00 CONTROL MODULE • C13BB-00 CONTROL MODULE POWER SUPPLY • C13BC-00 CONTROL MODULE IGN POWER SUP • C13BD-00 CONTROL MODULE IGN POWER SUP • C13D4-00 CONTROL MODULE • C13D8-00 CONTROL MODULE • C13DB-00 STEERING TORQUE SENSOR • C13DC-00 STEERING TORQUE SENSOR • C13DD-00 STEERING TORQUE SENSOR • C13DE-00 TEMPERATURE SENSOR • C13E0-00 ST CLUTCH COMMAND CIRCUIT • C13E1-00 STEERING CLUTCH • C13E2-00 FRONT WHEEL SENSOR SIGNAL 	A B C D E
4	<ul style="list-style-type: none"> • C13BE-00 FLEXRAY COMMUNICATION • C13BF-00 FLEXRAY COMMUNICATION • C13C0-00 FLEXRAY COMMUNICATION • C13C1-00 FLEXRAY COMMUNICATION • C13C2-00 FLEXRAY COMMUNICATION • C13C3-00 FLEXRAY COMMUNICATION • C13C4-00 FLEXRAY COMMUNICATION 	F STC
5	<ul style="list-style-type: none"> • C13A0-00 CONTROL MODULE • C13A1-00 CONTROL MODULE • C13A2-00 CONTROL MODULE • C13A3-00 CONTROL MODULE • C13A4-00 CONTROL MODULE • C13A5-00 CONTROL MODULE • C13A6-00 CONTROL MODULE • C13A7-00 CONTROL MODULE • C13AA-00 CONTROL MODULE • C13AD-00 CONTROL MODULE • C13AE-00 CONTROL MODULE • C13AF-00 CONTROL MODULE • C13B0-00 CONTROL MODULE • C13B1-00 CONTROL MODULE • C13B2-00 CONTROL MODULE • C13B3-00 CONTROL MODULE • C13B4-00 CONTROL MODULE • C13B5-00 CONTROL MODULE • C13B7-00 CONTROL MODULE • C13B8-00 CONTROL MODULE • C13BA-00 CONTROL MODULE POWER SUPPLY • C13D2-00 CONTROL MODULE • C13D3-00 CONTROL MODULE • C13D5-00 CONTROL MODULE • C13D6-00 CONTROL MODULE • C13D7-00 CONTROL MODULE • C13D9-00 CONTROL MODULE • C13DF-00 CONTROL MODULE 	H I J K L M N O
6	<ul style="list-style-type: none"> • C13E3-00 SPIRAL CABLE PROTECTION • C13E4-00 ST CLUTCH RELEASE PROTECTION • C13E5-00 ST CLUTCH RELEASE PROTECTION • C13E6-00 HEAT PROTECTION • C13E7-00 LOW VOLTAGE PROTECTION • C13E8-00 CURB STONE PROTECTION 	P

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC Index

INFOID:000000011286639

×: Applicable

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13A0-00	CONTROL MODULE	×	×	×	ON	STC-137
C13A1-00	CONTROL MODULE	×	×	×	ON	STC-139
C13A2-00	CONTROL MODULE	×	×	×	ON	STC-143
C13A3-00	CONTROL MODULE	×	×	×	ON	STC-146
C13A4-00	CONTROL MODULE		×	×	ON	STC-148
C13A5-00	CONTROL MODULE			×	OFF	—
C13A6-00	CONTROL MODULE		×		ON	STC-152
C13A7-00	CONTROL MODULE		×		ON	STC-153
C13A8-00	BACK UP CIRCUIT	×	×	×	ON	STC-155
C13A9-00	BACK UP CIRCUIT	×	×	×	ON	STC-160
C13AA-00	CONTROL MODULE	×	×	×	ON	STC-164
C13AB-00	CONTROL MODULE	×	×	×	ON	STC-168
C13AC-00	CONTROL MODULE		×		ON	STC-171
C13AD-00	CONTROL MODULE	×	×	×	ON	STC-174
C13AE-00	CONTROL MODULE	×	×	×	ON	STC-177
C13AF-00	CONTROL MODULE	×	×	×	ON	STC-180
C13B0-00	CONTROL MODULE	×	×	×	ON	STC-183
C13B1-00	CONTROL MODULE	×	×	×	ON	STC-186
C13B2-00	CONTROL MODULE	×	×	×	ON	STC-190
C13B3-00	CONTROL MODULE	×	×	×	ON	STC-194
C13B4-00	CONTROL MODULE	×	×	×	ON	STC-196
C13B5-00	CONTROL MODULE	×	×	×	ON	STC-199
C13B6-00	MOTOR CIRCUIT	×	×	×	ON	STC-203
C13B7-00	CONTROL MODULE	×	×	×	ON	STC-208
C13B8-00	CONTROL MODULE	×	×	×	ON	STC-211
C13B9-00	CONTROL MODULE	×	×	×	ON	STC-215
C13BA-00	CONTROL MODULE POWER SUPPLY	×	×	×	ON	STC-221
C13BB-00	CONTROL MODULE POWER SUPPLY	×	×	×	OFF	STC-226
C13BC-00	CONTROL MODULE IGN POWER SUP	×	×	×	OFF	STC-230
C13BD-00	CONTROL MODULE IGN POWER SUP		×		ON	STC-233
C13BE-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-237
C13BF-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-243
C13C0-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-251

STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13C1-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-260
C13C2-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-266
C13C3-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-276
C13C4-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-284
C13C5-00	STEERING ANGLE SENSOR SIGNAL	×			OFF	—
C13C6-00	G SENSOR SIGNAL	×			OFF	—
C13C7-00	VEHICL SPEED SIGNAL	×			OFF	—
C13C9-00	DRIVE MODE SIGNAL	×			OFF	—
C13CA-00	ENGINE STATUS SIGNAL	×			OFF	—
C13CC-00	T/M GEAR POSI SIGNAL	×			OFF	—
C13CD-00	ENGINE SPEED SIGNAL	×			OFF	—
C13CE-00	SLEEP WAKE UP SIGNAL	×			OFF	—
C13CF-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	STC-297
C13D0-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	STC-298
C13D1-00	STEERING ANGLE SENSOR SIGNAL		×		OFF	STC-299
C13D2-00	CONTROL MODULE	×	×	×	ON	STC-301
C13D3-00	CONTROL MODULE	×	×	×	ON	STC-304
C13D4-00	CONTROL MODULE	×	×	×	ON	STC-308
C13D5-00	CONTROL MODULE	×	×	×	ON	STC-314
C13D6-00	CONTROL MODULE	×	×	×	ON	STC-316
C13D7-00	CONTROL MODULE	×	×	×	ON	STC-319
C13D8-00	CONTROL MODULE	×	×		OFF	STC-323
C13D9-00	CONTROL MODULE	×	×		OFF	STC-326
C13DB-00	STEERING TORQUE SENSOR		×		ON	STC-328
C13DC-00	STEERING TORQUE SENSOR		×		ON	STC-331
C13DD-00	STEERING TORQUE SENSOR		×		ON	STC-334
C13DE-00	TEMPERATURE SENSOR	×	×	×	OFF	STC-339
C13DF-00	CONTROL MODULE		×		ON	STC-342
C13E0-00	ST CLUTCH COMMAND CIRCUIT	×			OFF	—
C13E1-00	STEERING CLUTCH	×			OFF	—
C13E2-00	BOOTING ST CLUTCH NORMAL ACT	×			OFF	—
C13E3-00	FRONT WHEEL SENSOR SIGNAL	×			OFF	—
C13E4-00	ST CLUTCH RELEASE PROTECTION	×			OFF	—
C13E5-00	ST CLUTCH RELEASE PROTECTION	×			OFF	—
C13E6-00	HEAT PROTECTION	×	×	×	OFF	STC-358

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STEERING ANGLE MAIN CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13E7-00	LOW VOLTAGE PROTECTION	×	×	×	OFF	STC-362
C13E8-00	CURB STONE PROTECTION	×	×	×	OFF	STC-367
C13E9-00	BOOTING ANGLE PROCESSING		×		ON	STC-370
C13EA-00	BOOTING ANGLE PROCESSING	×			OFF	—
C13EB-00	BOOTING ANGLE PROCESSING		×	×	ON	STC-374
C13EE-00	INCOMP CONFIG	×	×	×	ON	STC-378
C13EF-00	CONFIG CHECK RESULT	×	×	×	ON	STC-382
C13F0-00	INCOMP DAST CALIBRATION	×	×	×	ON	STC-386
C13F1-00	INCOMP ST ANG SEN ADJST	×			OFF	—
C13F2-00	DIFFERENT SOFTWARE VERSION	×	×	×	ON	STC-390
U1000-01	CAN COMM CIRCUIT	×	×		OFF	STC-393
U1010-49	CONTROL UNIT (CAN)	×	×		OFF	STC-395

NOTE:

If two or more DTCs are detected, refer to [STC-77, "DTC Inspection Priority Chart"](#).

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

STEERING ANGLE SUB CONTROL MODULE

Reference Value

INFOID:000000011286640

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Condition	Display value	
OWN ECU SYS STATUS	Judging system starting	BOOT	A
	System is diagnosing	DIAG1 – DIAG10	B
	Processing system shutdown	FIN1 – FIN12	C
	Finish the system control	DOWN1	D
	Wait for shutdown	DOWN2	E
	System is shutdown	DOWN3	F
	System is in fail-safe mode 1	MALF1	STC
	System is in fail-safe mode 2	MALF2	
	System is in fail-safe mode 3	MALF3	
	Performing initial setting	SETTING	
	System is in normal control	STD1 STD2	H
	System is in protection mode	STD3	
	System is synchronizing	SYNC	I
	ST ANG MAIN SYS STATUS	Judging system starting	BOOT
System is diagnosing		DIAG1 – DIAG10	K
Processing system shutdown		FIN1 – FIN12	L
Finish the system control		DOWN1	M
Wait for shutdown		DOWN2	N
System is shutdown		DOWN3	O
System is in fail-safe mode 1		MALF1	P
System is in fail-safe mode 2		MALF2	
System is in fail-safe mode 3		MALF3	
Performing initial setting		SETTING	
System is in normal control		STD1 STD2	
System is in protection mode		STD3	
System is synchronizing		SYNC	

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value
ST ANG SUB SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
ST FORCE SYS STATUS	Judging system starting	BOOT
	System is diagnosing	DIAG1 – DIAG10
	Processing system shutdown	FIN1 – FIN12
	Finish the system control	DOWN1
	Wait for shutdown	DOWN2
	System is shutdown	DOWN3
	System is in fail-safe mode 1	MALF1
	System is in fail-safe mode 2	MALF2
	System is in fail-safe mode 3	MALF3
	Performing initial setting	SETTING
	System is in normal control	STD1 STD2
	System is in protection mode	STD3
	System is synchronizing	SYNC
BACK UP CIRCUIT STATUS	Always	0 – 255
CONTROL MODULE CRNT	Always	0 – 255 A
DETAILED CODE 1	This is displayed, but it is not used.	0 – 255
DETAILED CODE 2	This is displayed, but it is not used.	0 – 255
DETAILED CODE 3	This is displayed, but it is not used.	0 – 255
FLEXRAY COMM SYNC STATS	Always	STAT1 – 10
STEERING MODE	Always	CHARA – CHARA I
ST CLUTCH PRTCT STATUS	Always	STAT0 – STAT12, STAT20
ST CLUTCH CON RQEST	Always	STAT0 – STAT5
FLEXRAY COMM DIAG (OWN)	FlexRay communication of steering angle sub control module is normal.	NORMAL
	FlexRay communication of steering angle sub control module is being diagnosed.	DIAG
	FlexRay communication of steering angle sub control module is malfunction.	MALF

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition	Display value		
FLEXRAY COMM DIAG (OTH1)	FlexRay communication of steering angle main control module is normal.	NORMAL	A	
	FlexRay communication of steering angle main control module is being diagnosed.	DIAG	B	
	FlexRay communication of steering angle main control module is malfunction.	MALF		
FLEXRAY COMM DIAG (OTH2)	FlexRay communication of steering force control module is normal.	NORMAL	C	
	FlexRay communication of steering force control module is being diagnosed.	DIAG	D	
	FlexRay communication of steering force control module is malfunction.	MALF		
POWER TRAIN STATUS	Power train stops.	STOP	E	
	Power train starts.	RUN		
IGN SW STATUS (OWN ECU)	Ignition switch: ON	Control module detects ignition voltage.	ON	F
		Control module does not detect ignition voltage.	OFF	
IGN SW STATUS (SYSTEM)	Ignition switch: ON	Control module detects ignition voltage.	ON	STC
		Control module does not detect ignition voltage.	OFF	
STOP/START STATUS	Stop/start system is operating.		ON	
	Stop/start system is not operating.		OFF	I
INSTANT VLT DROP DETECT	Instantaneous voltage drop status is not detected.		UNDTCT	
	Instantaneous voltage drop status is detected.		DETECT	
CURB STONE DETECT STATS	The state of hitting curb stone is not detected.		UNDTCT	J
	The state of hitting curb stone is detected.		DETECT	
BACK UP CIRCUIT A STATUS	System is abnormal.		STAT1	K
	System is normal.		STAT2	
BACK UP CIRCUIT B STATUS	System is abnormal.		STAT1	L
	System is normal.		STAT2	
FREE ROLLER MODE	Free roller mode: ON		ON	M
	Free roller mode: OFF		OFF	
CHASSIS DYNAMO MODE	Engine running	System is normal mode (Driving is OK)	PERMIT	
		System is chassis dynamometer mode (Driving is NG)	PROHBT	N
WRITING STATUS	When system is starting, the required angle information is recorded in control module.		OK	O
	When system is starting, the required angle information is not recorded in control module.		NG	
BACK UP SIG 1 VOLT	Ignition switch ON	When steering angle sub control module is normal.	Approx. 0 – 5 V	P
BACK UP SIG 2 VOLT	Ignition switch ON	When steering angle sub control module is normal.	Approx. 0 – 5 V	
INVERTER RELAY ACT VOLT	Engine running		Battery voltage	
CONT MODULE INSIDE VOLT	Engine running		Battery voltage – Approx. 0.6 V	
BATTERY VOLT AGE	Ignition switch ON		Battery voltage	

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
IGN VOLTAGE	Ignition switch ON		Battery voltage
C/M TEMPERATURE	Engine running		Display temperature of inside of steering angle sub control module [°C °F]
VEHICLE SPEED	Vehicle stopped		0.00 km/h or 0.00 MPH
	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 ±10%)
YAW RATE	Vehicle stopped		Approx. 0 deg/s
	Vehicle turning		Approx. 0 - ±201 deg/s
SIDE G	Vehicle stopped		Approx. 0 m/s ²
	Vehicle turning		Approx. 0 - ±2 m/s ²
ST CLUTCH ACT CURRENT	Engine running		Approx. 0 – 5 A
MOTOR U ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
MOTOR W ACT CURRENT	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 A
		Steering wheel: Right turn	Positive vale (Approx. 0 - 70 A)
		Steering wheel: Left turn	Negative vale [Approx. (-70) - (0) A]
TORQUE SEN MAIN 1	Engine running		Approx. (-8.5) – 8.5 N·m
TEMPERATURE SENSOR	Ignition switch ON or Engine running		Display temperature of inside of steering angle sub control module [°C °F]
ANGLE SENSOR SIGNAL 1	Engine running		Approx. 1.0 - 3.5 V
ANGLE SENSOR SIGNAL 2	Engine running		Approx. 1.0 - 3.5 V
ANGLE 1	Engine running		Approx. (-4.4) – 4.4 deg
ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale
		Steering wheel: Left turn	Negative vale
F/B ANGLE 1	Engine running		Approx. (-20) – 20 deg
F/B ANGLE 2	Engine running		Approx. (-6) – 6 deg
ST ANGLE SENSOR	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 900 deg)
		Steering wheel: Left turn	Negative vale [Approx. (-900) – 0 deg]
ANGLE DIFFERENCE	Engine running		Approx. 0 – 300 deg

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Monitor item	Condition		Display value
STEERING PINION ANGLE	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (–550) – 0 deg]
STEERING PINION ANGLE 2	Engine running	Steering wheel: Not steering (There is no steering force)	Approx. 0 deg
		Steering wheel: Right turn	Positive vale (Approx. 0 – 550 deg)
		Steering wheel: Left turn	Negative vale [Approx. (–550) – 0 deg]
ANGLE 3	Engine running		Approx. (–7425) – 7425 deg

Fail-safe

INFOID:000000011286641

- If a malfunction occurs in the system, the fail-safe function stops the system (mode 3), activates the fail-safe mode (mode 1 or mode 2) or activates the protection mode. When the system enters mode 1, mode 2 or mode 3, the power steering warning lamp illuminates to inform the driver that the turning force is heavy in effect.
- Since three control modules monitor malfunctions mutually, DTC code varies from control module to control module.

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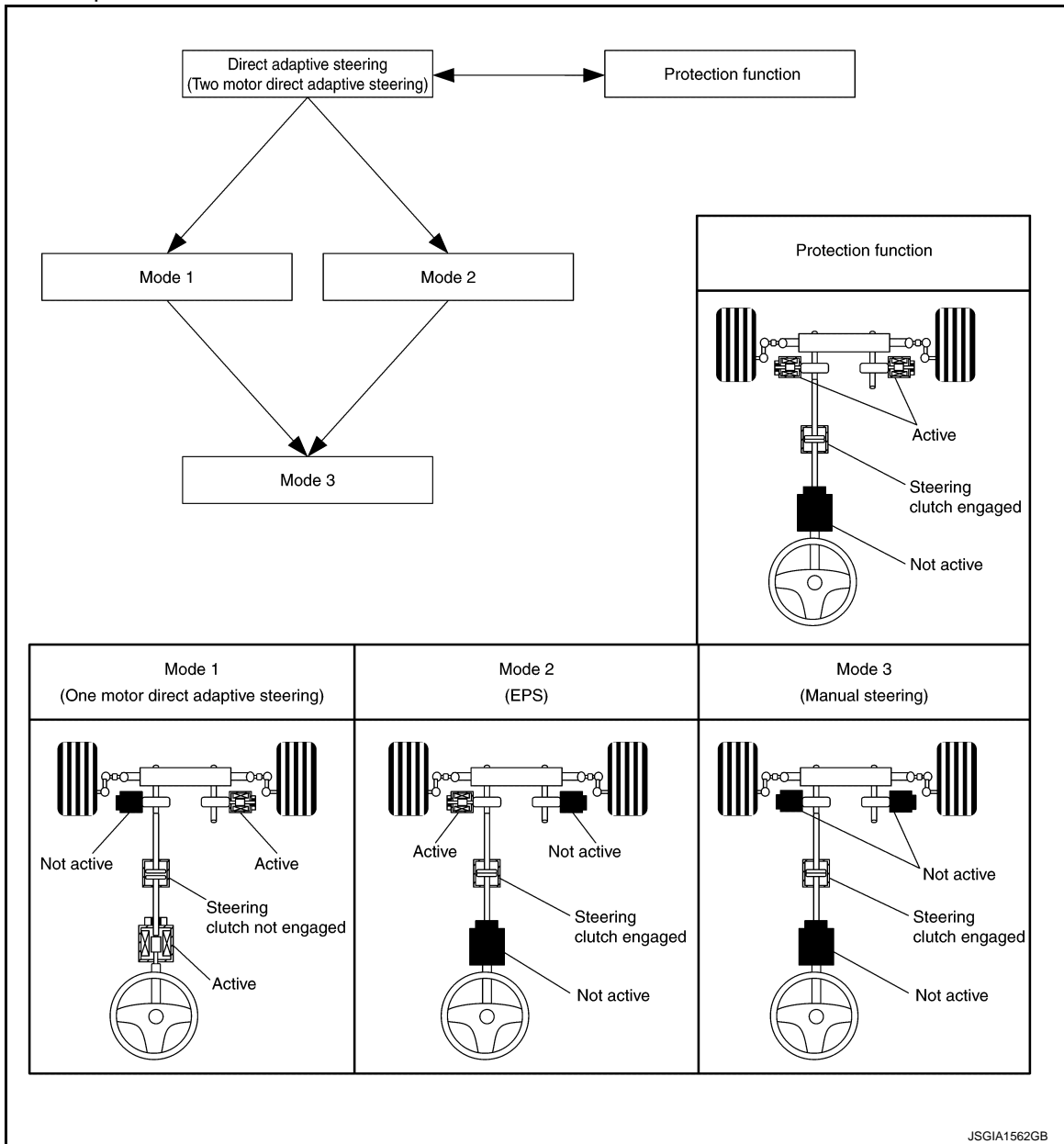
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STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

- For details of protection function, refer to [STC-102. "Protection Function"](#).



DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13A0-00	Variable	Variable	Variable
C13A1-00	—	Mode 2	Mode 2
C13A2-00	Mode 1 or Mode 3	Mode 1 or Mode 3	Mode 1 or Mode 3
C13A3-00	Mode 2	Mode 2	Mode 2
C13A4-00	—	Mode 2	Mode 2
C13A5-00	—	—	Mode 2
C13A6-00	—	Mode 3	—
C13A7-00	—	Mode 3	—
C13A8-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13A9-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13AA-00	Mode 2	Mode 3	Mode 2

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPIVE STEERING]

DTC	Relation between control module detecting DTC and system status			
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC	
C13AB-00	Mode 2	Mode 3	Mode 2	A
C13AC-00	—	Mode 3	—	B
C13AD-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13AE-00	Mode 2	Mode 3	Mode 2	C
C13AF-00	Mode 2	Mode 3	Mode 2	
C13B0-00	Mode 2	Mode 3	Mode 2	D
C13B1-00	Mode 2	Mode 3	Mode 2	
C13B2-00	Mode 2	Mode 1 or Mode 3	Mode 2	E
C13B3-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B4-00	Mode 2	Mode 3	Mode 2	F
C13B5-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B6-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B7-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13B8-00	Mode 2	Mode 1 or Mode 3	Mode 2	STC
C13B9-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13BA-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13BB-00	—	—	—	H
C13BC-00	—	—	—	
C13BD-00	—	Mode 2	—	I
C13BE-00	Mode 2	Mode 2	Mode 2	
C13BF-00	Variable	Variable	Variable	
C13C0-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3	J
C13C1-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3	
C13C2-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3	K
C13C3-00	Mode 1, Mode 2 or Mode 3	Mode 2	Mode 1, Mode 2 or Mode 3	
C13C4-00	Mode 2	Mode 1 or Mode 3	Mode 2	L
C13C5-00	Mode 2	—	—	
C13C6-00	Mode 2	—	—	
C13C7-00	Mode 2	—	—	
C13C8-00	—	—	—	M
C13C9-00	—	—	—	
C13CA-00	—	—	—	N
C13CB-00	—	—	—	
C13CC-00	—	—	—	
C13CD-00	—	—	—	O
C13CE-00	—	—	—	
C13CF-00	—	—	—	P
C13D0-00	—	—	—	
C13D1-00	—	—	—	
C13D2-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13D3-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13D4-00	Mode 2	Mode 1 or Mode 3	Mode 2	
C13D5-00	Mode 2	Mode 1 or Mode 3	Mode 2	

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Relation between control module detecting DTC and system status		
	When steering force control module detects DTC	When steering angle main control module detects DTC	When steering angle sub control module detects DTC
C13D6-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D7-00	Mode 2	Mode 1 or Mode 3	Mode 2
C13D8-00	—	—	—
C13D9-00	—	—	—
C13DA-00	—	—	—
C13DB-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DC-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DD-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13DE-00	Protection function mode	Protection function mode	Protection function mode
C13DF-00	—	Mode 3 ^{*1} Mode 2 ^{*2}	—
C13E0-00	Mode 2	—	—
C13E1-00	Mode 2	—	—
C13E2-00	—	—	—
C13E3-00	Protection function mode	—	—
C13E4-00	Protection function mode	—	—
C13E5-00	Mode 2	—	—
C13E6-00	Protection function mode	Protection function mode	Protection function mode
C13E7-00	Protection function mode	Protection function mode	Protection function mode
C13E8-00	Protection function mode	Protection function mode	Protection function mode
C13E9-00	—	Mode 2	—
C13EA-00	Mode 2	—	—
C13EB-00	—	Mode 2	Mode 2
C13EE-00	Mode 3	Mode 3	Mode 3
C13EF-00	Mode 3	Mode 3	Mode 3
C13F0-00	Mode 2	Mode 2	Mode 2
C13F1-00	Mode 2	—	—
C13F2-00	Mode 2 or Mode 3	Mode 2 or Mode 3	Mode 2 or Mode 3
U1000-01	—	—	—
U1010-49	—	—	—

- *1: When control module detects a malfunction at startup.
- *2: When control module detects a malfunction except during startup.

Protection Function

INFOID:0000000011286642

- When battery voltage malfunctions temporarily, system overheats continuously and system is overloaded continuously, system is in protection mode temporarily. This is not malfunction.
- When a causative condition is cleared, the system returns to normal control automatically. (Except C13E5-00)
- Since the protection function condition is not malfunction, power steering warning lamp does not turn ON. (Except C13E5-00) The following DTCs remain to distinguish from malfunction.

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Condition	Vehicle condition	
C13E3-00	The steering wheel is steered over the limit angle.	System changes to the protection mode temporarily. (Steering operation may become heavy temporarily, however steering wheel can be operated without interference. This is not a system malfunction.)	A
C13E4-00	When steering clutch is released, steering clutch is not released within regular time with overloading steering wheel.		B
C13E5-00	When steering clutch is released, steering clutch is not released in spite of trying to release it many times with overloading steering wheel.	System changes to fail-safe mode (mode 2). For fail-safe, refer to STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe" .	C
C13E6-00	EPS/DAST 3: Internal temperature of steering force motor is 150°C (302°F) or more.		D
	DAST 1, DAST 2: Internal temperature of control module is 90°C (194°F) or more.		E
C13E7-00	Power supply voltage of control module is low temporarily.		F
C13E8-00	<ul style="list-style-type: none"> Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. Steering gear is out of neutral position. (Large) 		STC

DTC Inspection Priority Chart

INFOID:000000011286643

When multiple DTCs are detected simultaneously, check one by one depending on the following priority list.

Priority	Priority order item (DTC)		
1	<ul style="list-style-type: none"> C13C5-00 STEERING ANGLE SENSOR SIGNAL C13C6-00 G SENSOR SIGNAL C13C7-00 VEHICL SPEED SIGNAL C13C8-00 ST FUNCTION REQUEST SIGNAL C13C9-00 DRIVE MODE SIGNAL C13CA-00 ENGINE STATUS SIGNAL C13CB-00 STOP/START SIGNAL C13CC-00 T/M GEAR POSI SIGNAL C13CD-00 ENGINE SPEED SIGNAL C13CE-00 SLEEP/WAKEUP SIGNAL C13CF-00 ALC FUNCTION REQUEST SIGNAL C13D0-00 ALC FUNCTION REQUEST SIGNAL C13D1-00 STEERING ANGLE SENSOR SIGNAL U1000-01 CAN COMM CIRCUIT U1010-49 CONTROL UNIT (CAN) 	I	
	2	<ul style="list-style-type: none"> C13E9-00 BOOTING ANGLE PROCESSING C13EA-00 BOOTING ANGLE PROCESSING C13EB-00 BOOTING ANGLE PROCESSING C13EE-00 INCOMP CONFIG C13EF-00 CONFIG CHECK RESULT C13F0-00 IMCOMP DAST CALIBRATION C13F1-00 INCOMP ST ANG SEN ADJST C13F2-00 DIFFERENT SOFTWARE VERSION 	J
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STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

Priority	Priority order item (DTC)
3	<ul style="list-style-type: none">• C13A8-00 BACK UP CIRCUIT• C13A9-00 BACK UP CIRCUIT• C13AB-00 CONTROL MODULE• C13AC-00 CONTROL MODULE• C13B6-00 MOTOR CIRCUIT• C13B9-00 CONTROL MODULE• C13BB-00 CONTROL MODULE POWER SUPPLY• C13BC-00 CONTROL MODULE IGN POWER SUP• C13BD-00 CONTROL MODULE IGN POWER SUP• C13D4-00 CONTROL MODULE• C13D8-00 CONTROL MODULE• C13DB-00 STEERING TORQUE SENSOR• C13DC-00 STEERING TORQUE SENSOR• C13DD-00 STEERING TORQUE SENSOR• C13DE-00 TEMPERATURE SENSOR• C13E0-00 ST CLUTCH COMMAND CIRCUIT• C13E1-00 STEERING CLUTCH• C13E2-00 FRONT WHEEL SENSOR SIGNAL
4	<ul style="list-style-type: none">• C13BE-00 FLEXRAY COMMUNICATION• C13BF-00 FLEXRAY COMMUNICATION• C13C0-00 FLEXRAY COMMUNICATION• C13C1-00 FLEXRAY COMMUNICATION• C13C2-00 FLEXRAY COMMUNICATION• C13C3-00 FLEXRAY COMMUNICATION• C13C4-00 FLEXRAY COMMUNICATION
5	<ul style="list-style-type: none">• C13A0-00 CONTROL MODULE• C13A1-00 CONTROL MODULE• C13A2-00 CONTROL MODULE• C13A3-00 CONTROL MODULE• C13A4-00 CONTROL MODULE• C13A5-00 CONTROL MODULE• C13A6-00 CONTROL MODULE• C13A7-00 CONTROL MODULE• C13AA-00 CONTROL MODULE• C13AD-00 CONTROL MODULE• C13AE-00 CONTROL MODULE• C13AF-00 CONTROL MODULE• C13B0-00 CONTROL MODULE• C13B1-00 CONTROL MODULE• C13B2-00 CONTROL MODULE• C13B3-00 CONTROL MODULE• C13B4-00 CONTROL MODULE• C13B5-00 CONTROL MODULE• C13B7-00 CONTROL MODULE• C13B8-00 CONTROL MODULE• C13BA-00 CONTROL MODULE POWER SUPPLY• C13D2-00 CONTROL MODULE• C13D3-00 CONTROL MODULE• C13D5-00 CONTROL MODULE• C13D6-00 CONTROL MODULE• C13D7-00 CONTROL MODULE• C13D9-00 CONTROL MODULE• C13DF-00 CONTROL MODULE
6	<ul style="list-style-type: none">• C13E3-00 SPIRAL CABLE PROTECTION• C13E4-00 ST CLUTCH RELEASE PROTECTION• C13E5-00 ST CLUTCH RELEASE PROTECTION• C13E6-00 HEAT PROTECTION• C13E7-00 LOW VOLTAGE PROTECTION• C13E8-00 CURB STONE PROTECTION

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC Index

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×: Applicable

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13A0-00	CONTROL MODULE	×	×	×	ON	STC-137
C13A1-00	CONTROL MODULE	×	×	×	ON	STC-140
C13A2-00	CONTROL MODULE	×	×	×	ON	STC-144
C13A3-00	CONTROL MODULE	×	×	×	ON	STC-147
C13A4-00	CONTROL MODULE		×	×	ON	STC-149
C13A5-00	CONTROL MODULE			×	ON	STC-150
C13A6-00	CONTROL MODULE		×		OFF	—
C13A7-00	CONTROL MODULE		×		OFF	—
C13A8-00	BACK UP CIRCUIT	×	×	×	ON	STC-157
C13A9-00	BACK UP CIRCUIT	×	×	×	ON	STC-162
C13AA-00	CONTROL MODULE	×	×	×	ON	STC-165
C13AB-00	CONTROL MODULE	×	×	×	ON	STC-169
C13AC-00	CONTROL MODULE		×		OFF	—
C13AD-00	CONTROL MODULE	×	×	×	ON	STC-175
C13AE-00	CONTROL MODULE	×	×	×	ON	STC-178
C13AF-00	CONTROL MODULE	×	×	×	ON	STC-181
C13B0-00	CONTROL MODULE	×	×	×	ON	STC-184
C13B1-00	CONTROL MODULE	×	×	×	ON	STC-187
C13B2-00	CONTROL MODULE	×	×	×	ON	STC-191
C13B3-00	CONTROL MODULE	×	×	×	ON	STC-194
C13B4-00	CONTROL MODULE	×	×	×	ON	STC-197
C13B5-00	CONTROL MODULE	×	×	×	ON	STC-200
C13B6-00	MOTOR CIRCUIT	×	×	×	ON	STC-205
C13B7-00	CONTROL MODULE	×	×	×	ON	STC-209
C13B8-00	CONTROL MODULE	×	×	×	ON	STC-212
C13B9-00	CONTROL MODULE	×	×	×	ON	STC-217
C13BA-00	CONTROL MODULE POWER SUPPLY	×	×	×	ON	STC-222
C13BB-00	CONTROL MODULE POWER SUPPLY	×	×	×	OFF	STC-228
C13BC-00	CONTROL MODULE IGN POWER SUP	×	×	×	OFF	STC-230
C13BD-00	CONTROL MODULE IGN POWER SUP		×		OFF	—
C13BE-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-238
C13BF-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-243
C13C0-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-253

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STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13C1-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-260
C13C2-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-269
C13C3-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-279
C13C4-00	FLEXRAY COMMUNICATION	×	×	×	ON	STC-284
C13C5-00	STEERING ANGLE SENSOR SIGNAL	×			OFF	—
C13C6-00	G SENSOR SIGNAL	×			OFF	—
C13C7-00	VEHICL SPEED SIGNAL	×			OFF	—
C13C9-00	DRIVE MODE SIGNAL	×			OFF	—
C13CA-00	ENGINE STATUS SIGNAL	×			OFF	—
C13CC-00	T/M GEAR POSI SIGNAL	×			OFF	—
C13CD-00	ENGINE SPEED SIGNAL	×			OFF	—
C13CE-00	SLEEP WAKE UP SIGNAL	×			OFF	—
C13CF-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	—
C13D0-00	ALC FUNCTION REQUEST SIGNAL		×		OFF	—
C13D1-00	STEERING ANGLE SENSOR SIGNAL		×		OFF	—
C13D2-00	CONTROL MODULE	×	×	×	ON	STC-302
C13D3-00	CONTROL MODULE	×	×	×	ON	STC-305
C13D4-00	CONTROL MODULE	×	×	×	ON	STC-310
C13D5-00	CONTROL MODULE	×	×	×	ON	STC-314
C13D6-00	CONTROL MODULE	×	×	×	ON	STC-317
C13D7-00	CONTROL MODULE	×	×	×	ON	STC-320
C13D8-00	CONTROL MODULE	×	×		OFF	—
C13D9-00	CONTROL MODULE	×	×		OFF	—
C13DB-00	STEERING TORQUE SENSOR		×		OFF	—
C13DC-00	STEERING TORQUE SENSOR		×		OFF	—
C13DD-00	STEERING TORQUE SENSOR		×		OFF	—
C13DE-00	TEMPERATURE SENSOR	×	×	×	OFF	STC-340
C13DF-00	CONTROL MODULE		×		OFF	—
C13E0-00	ST CLUTCH COMMAND CIRCUIT	×			OFF	—
C13E1-00	STEERING CLUTCH	×			OFF	—
C13E2-00	FRONT WHEEL SENSOR SIGNAL	×			OFF	—
C13E3-00	SPIRAL CABLE PROTECTION	×			OFF	—
C13E4-00	ST CLUTCH RELEASE PROTECTION	×			OFF	—
C13E5-00	ST CLUTCH RELEASE PROTECTION	×			OFF	—
C13E6-00	HEAT PROTECTION	×	×	×	OFF	STC-359

STEERING ANGLE SUB CONTROL MODULE

< ECU DIAGNOSIS INFORMATION >

[DIRECT ADAPTIVE STEERING]

DTC	Items	Detecting control module			Power steering warning lamp	Reference
		Steering force control module	Steering angle main control module	Steering angle sub control module		
C13E7-00	LOW VOLTAGE PROTECTION	×	×	×	OFF	STC-364
C13E8-00	CURB STONE PROTECTION	×	×	×	OFF	STC-368
C13E9-00	BOOTING ANGLE PROCESSING		×		OFF	—
C13EA-00	BOOTING ANGLE PROCESSING	×			OFF	—
C13EB-00	BOOTING ANGLE PROCESSING		×	×	ON	STC-375
C13EE-00	INCOMP CONFIG	×	×	×	ON	STC-379
C13EF-00	CONFIG CHECK RESULT	×	×	×	ON	STC-383
C13F0-00	INCOMP DAST CALIBRATION	×	×	×	ON	STC-386
C13F1-00	INCOMP ST ANG SEN ADJST	×			OFF	—
C13F2-00	DIFFERENT SOFTWARE VERSION	×	×	×	ON	STC-390
U1000-01	CAN COMM CIRCUIT	×	×		OFF	—
U1010-49	CONTROL UNIT (CAN)	×	×		OFF	—

NOTE:

If two or more DTCs are detected, refer to [STC-77, "DTC Inspection Priority Chart"](#).

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DIRECT ADAPTIVE STEERING

[DIRECT ADAPTIVE STEERING]

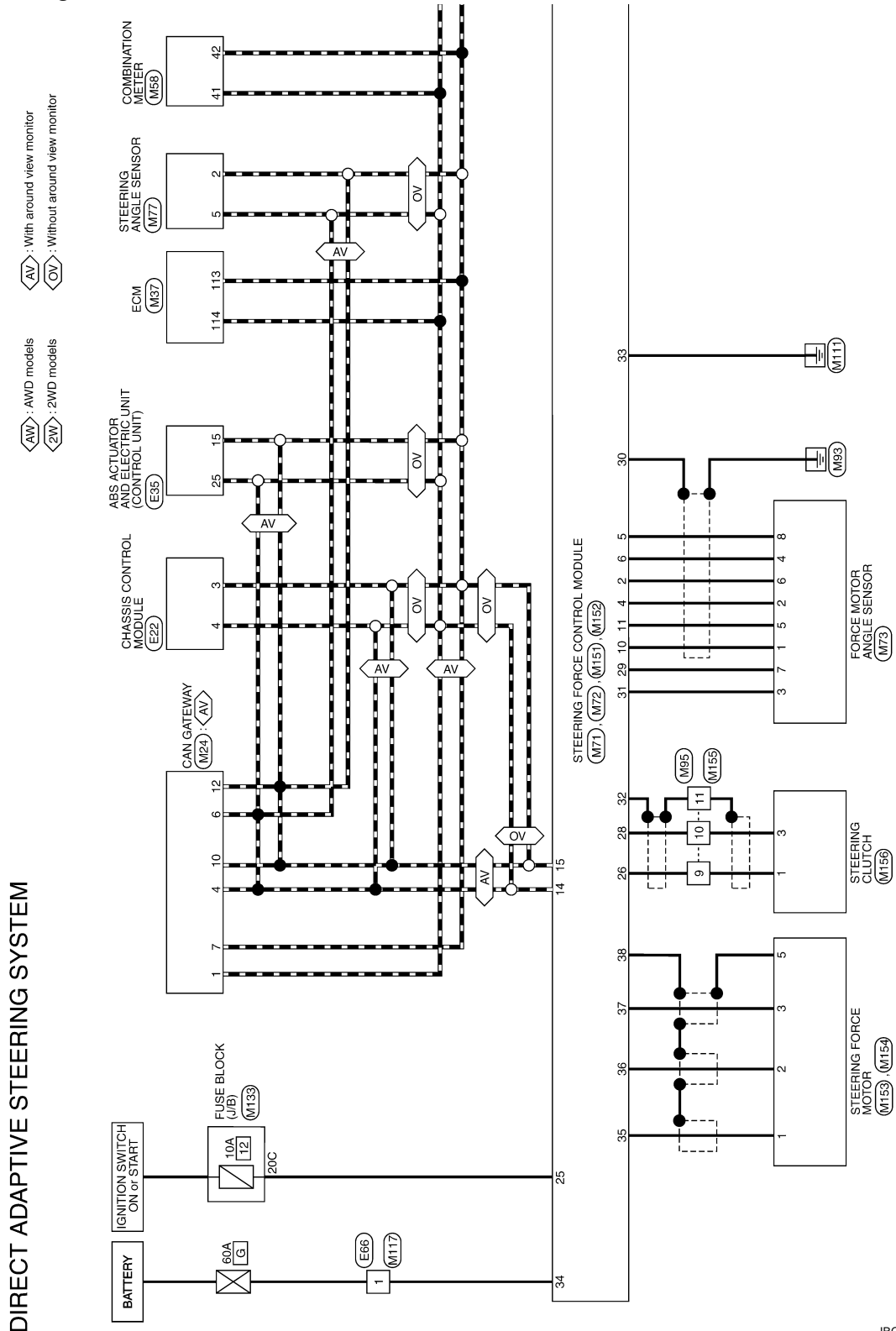
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WIRING DIAGRAM

DIRECT ADAPTIVE STEERING

Wiring Diagram

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*: This connector is not shown in "Harness Layout".

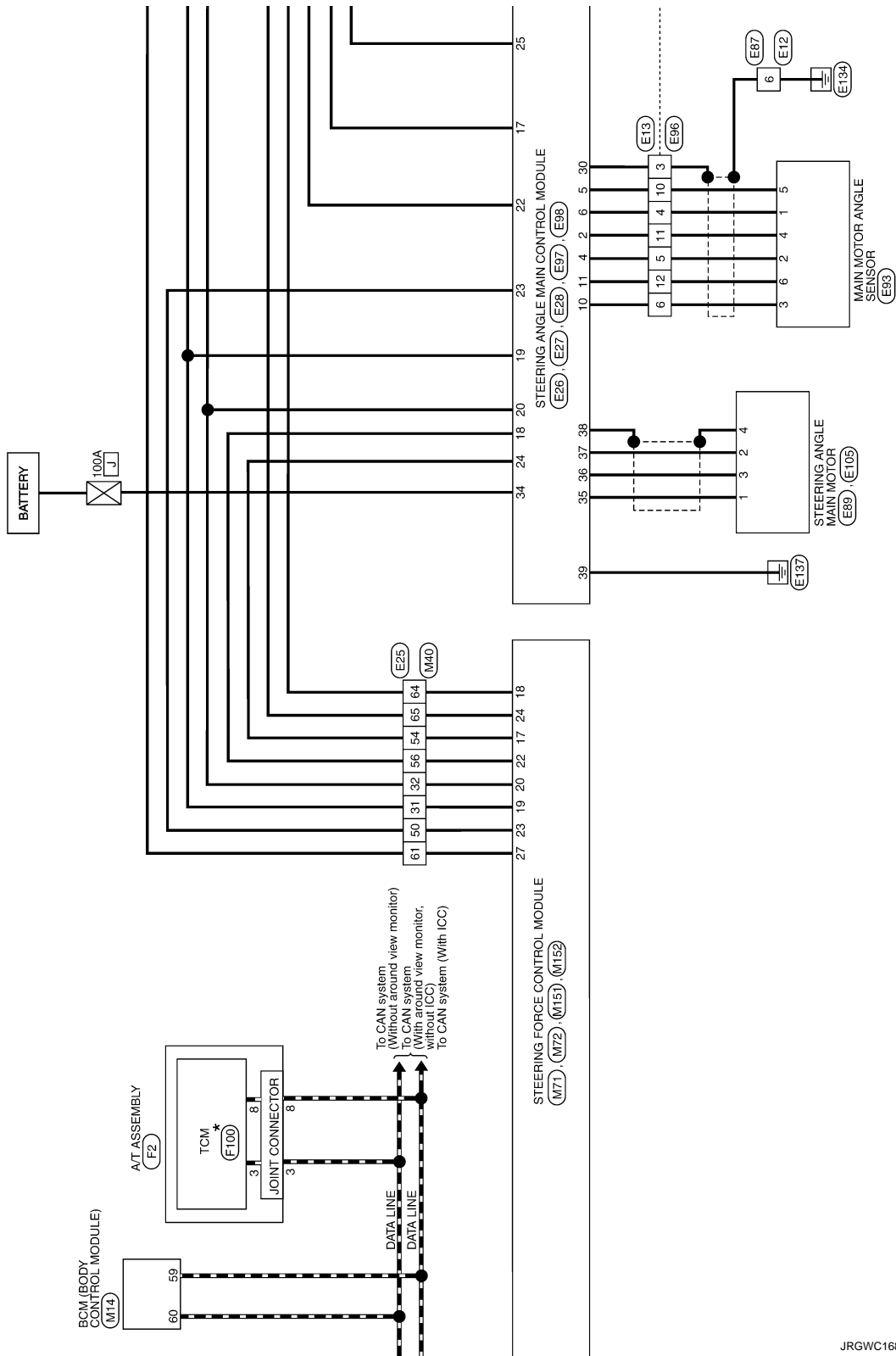
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DIRECT ADAPTIVE STEERING

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[DIRECT ADAPTIVE STEERING]



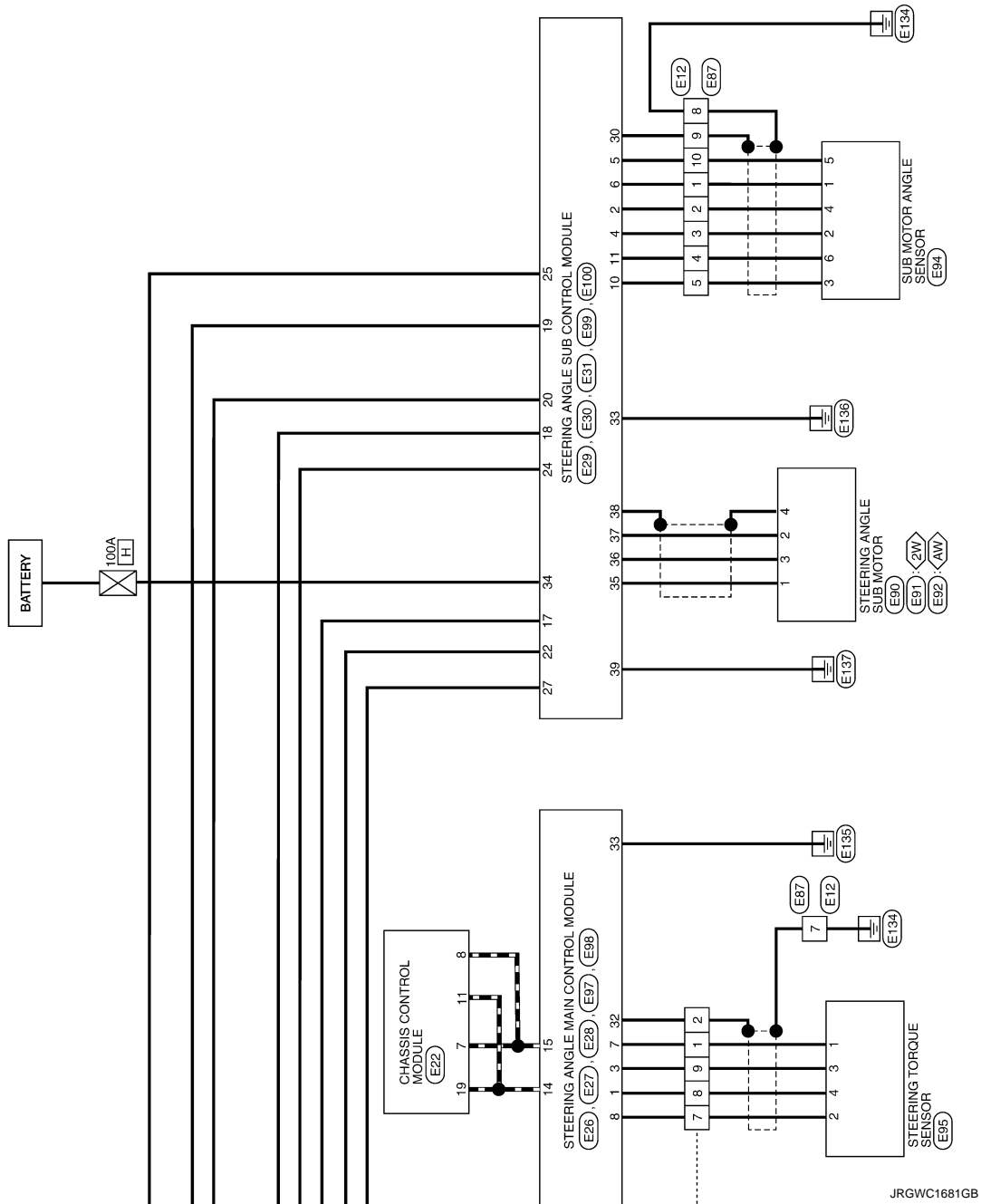
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DIRECT ADAPTIVE STEERING

< WIRING DIAGRAM >

[DIRECT ADAPTIVE STEERING]



DIRECT ADAPTIVE STEERING

< WIRING DIAGRAM >

[DIRECT ADAPTIVE STEERING]

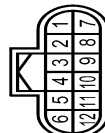
DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	E12
Connector Name	WIRE TO WIRE
Connector Type	RH10MB



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	-
2	Y	-
3	G	-
4	BR	-
5	R	-
6	B	-
7	B	-
8	B	-
9	B	-
10	L	-

Connector No.	E13
Connector Name	WIRE TO WIRE
Connector Type	RH12FB



Terminal No.	Color Of Wire	Signal Name [Specification]
1	SB	-
2	GR	-
3	B	-
4	L	-
5	G	-
6	R	-
7	P	-
8	BR	-
9	LG	-

10	W	-
11	Y	-
12	BR	-

Connector No.	E22
Connector Name	CHASIS CONTROL MODULE
Connector Type	TH24FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
3	P	CANL
4	L	CANH
5	V	DRIVE MODE SELECT SW (UP)
6	G	DRIVE MODE SELECT SW (DOWN)
7	W	CHASSIS COMM-L
8	W	CHASSIS COMM-L
10	G	IGN
11	L	CHASSIS COMM-H
12	B	GROUND
19	L	CHASSIS COMM-H

Connector No.	E25
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS 16-TM4

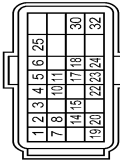


Terminal No.	Color Of Wire	Signal Name [Specification]
2	W	-
3	LG	-
4	BR	-
6	V	-

7	L	-
10	BR	-
11	L	-
12	GR	-
13	W	-
14	B	-
15	SB	-
16	Y	-
17	BR	-
18	P	-
31	Y	-
32	GR	-
35	GR	-
36	R	-
37	V	-
38	L	-
39	Y	-
40	SB	-
41	LG	-
44	Y	-
45	W	-
46	B	-
47	G	-
48	SHIELD	-
49	R	-
50	BR	-
51	L	-
52	W	-
53	V	-
54	P	-
55	W	-
56	SB	-
57	BG	-
58	B	-
59	W	-
61	R	-
62	SB	-
63	LG	-
64	Y	-
65	SB	-
66	GR	-
67	LG	-
68	BG	-
71	LG	-
72	V	-
73	G	-
74	BR	-
75	V	-
78	P	-

79	SB	-
83	R	-
86	BG	-
91	G	-
92	Y	-
94	GR	-
95	BG	-
96	W	-
97	LG	-
98	L	-
99	P	-
100	SHIELD	-

Connector No.	E26
Connector Name	STEERING ANGLE MAIN CONTROL MODULE
Connector Type	RH24FB-RZ6-L-J-H



Terminal No.	Color Of Wire	Signal Name [Specification]
1	BR	TORQUE SENSOR MAIN SIGNAL
2	V	TORQUE SENSOR SUB SIGNAL
3	LG	TORQUE SENSOR SUB SIGNAL
4	G	TORQUE SENSOR SUB SIGNAL
5	W	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (S1-S4)
6	L	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (S2-S4)
7	SB	TORQUE SENSOR GROUND
8	P	TORQUE SENSOR POWER SUPPLY
10	R	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R1-R2)
11	BR	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R2-R2)
14	L	CHASSIS COMMUNICATION-H
15	W	CHASSIS COMMUNICATION-L
17	BG	BACK UP SIGNAL FROM STEERING ANGLE MAIN CONTROL MODULE
18	SB	BACK UP SIGNAL FROM STEERING ANGLE MAIN CONTROL MODULE
19	Y	FLEXRAY COMMUNICATION-H
20	GR	FLEXRAY COMMUNICATION-L
22	GR	BACK UP SIGNAL TO STEERING ANGLE MAIN CONTROL MODULE
23	BR	CAN WAKE UP
24	P	BACK UP SIGNAL TO STEERING ANGLE MAIN CONTROL MODULE
25	G	CHASSIS COMMUNICATION-H
30	B	GROUND

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DIRECT ADAPTIVE STEERING

< WIRING DIAGRAM >

[DIRECT ADAPTIVE STEERING]

DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	E29
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	RH24FB-RZ8-L-IH

Terminal No.	Color Of Wire	Signal Name [Specification]
32	GR	GROUND



Connector No.	E27
Connector Name	STEERING ANGLE MAIN CONTROL MODULE
Connector Type	Y02FB-1V

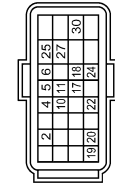
Terminal No.	Color Of Wire	Signal Name [Specification]
33	B	GROUND
34	R	BATTERY POWER SUPPLY



Connector No.	E28
Connector Name	STEERING ANGLE MAIN CONTROL MODULE
Connector Type	P01FB-A



Connector No.	E31
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	P01FB-A



Terminal No.	Color Of Wire	Signal Name [Specification]
2	Y	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S1-S3)
4	G	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S1-S3)
5	L	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S2-S4)
6	W	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (S2-S4)
10	R	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R1-R4)
11	BR	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R1-R4)
17	GR	BACK UP SIGNAL FROM STEERING ANGLE MAIN CONTROL MODULE
18	SB	BACK UP SIGNAL FROM STEERING ANGLE MAIN CONTROL MODULE
19	Y	FLEXRAY COMMUNICATION-H
20	GR	FLEXRAY COMMUNICATION-L
22	BG	BACK UP SIGNAL TO STEERING ANGLE MAIN CONTROL MODULE
24	Y	BACK UP SIGNAL TO STEERING ANGLE MAIN CONTROL MODULE
25	R	BATTERY POWER SUPPLY FROM STEERING ANGLE MAIN CONTROL MODULE
27	G	BATTERY POWER SUPPLY TO STEERING ANGLE MAIN CONTROL MODULE
30	B	GROUND

Connector No.	E30
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	Y02FB-1V



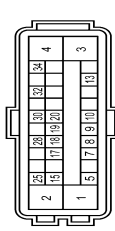
Terminal No.	Color Of Wire	Signal Name [Specification]
33	B	GROUND
34	G	BATTERY POWER SUPPLY

Connector No.	E31
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	P01FB-A



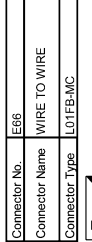
Terminal No.	Color Of Wire	Signal Name [Specification]
39	B	GROUND

Connector No.	E35
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Type	SAZ20FB-SJ24-U



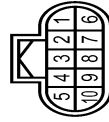
Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GROUND
2	B	GROUND
3	G	VALVE BATTERY
4	Y	MOTOR BATTERY
5	LG	STOP LAMP SW SIGNAL
7	GR	RR LH WHEEL SENSOR SIGNAL
8	G	RR LH WHEEL SENSOR POWER SUPPLY
9	BR	FR RH WHEEL SENSOR SIGNAL
10	GR	FR RH WHEEL SENSOR POWER SUPPLY
13	R	VACUUM SENSOR SIGNAL
15	P	CAN-L
17	Y	RR RH WHEEL SENSOR SIGNAL
18	V	RR RH WHEEL SENSOR POWER SUPPLY
19	SB	FR LH WHEEL SENSOR SIGNAL
20	BG	FR LH WHEEL SENSOR POWER SUPPLY
25	L	CAN-H
28	G	VACUUM SENSOR POWER SUPPLY
30	R	VDC OFF SW SIGNAL
32	SHIELD	VACUUM SENSOR GROUND

Connector No.	E66
Connector Name	WIRE TO WIRE
Connector Type	L01FB-MC



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-

Connector No.	E87
Connector Name	WIRE TO WIRE
Connector Type	RH10FB



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	-
2	Y	-
3	R	-
4	L	-
5	BR	-
6	GR	-
7	V	-
8	B	-
9	SHIELD	-
10	G	-

DIRECT ADAPTIVE STEERING

[DIRECT ADAPTIVE STEERING]

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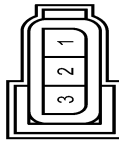
DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	E89
Connector Name	STEERING ANGLE MAIN MOTOR
Connector Type	IE-LA6



Terminal No.	Color Of Wire	Signal Name [Specification]
4	SHIELD	GROUND

Connector No.	E90
Connector Name	STEERING ANGLE SUB MOTOR
Connector Type	Y03FB-R



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	STEERING ANGLE SUB MOTOR U-PHASE
2	W/L	STEERING ANGLE SUB MOTOR W-PHASE
3	W	STEERING ANGLE SUB MOTOR V-PHASE

Connector No.	E91
Connector Name	STEERING ANGLE SUB MOTOR
Connector Type	RS01FB



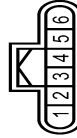
Terminal No.	Color Of Wire	Signal Name [Specification]
4	SHIELD	GROUND

Connector No.	E92
Connector Name	STEERING ANGLE SUB MOTOR
Connector Type	E-LA6



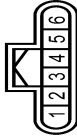
Terminal No.	Color Of Wire	Signal Name [Specification]
4	SHIELD	GROUND

Connector No.	E93
Connector Name	MAIN MOTOR ANGLE SENSOR
Connector Type	RH06FB



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R-S4)
2	R	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R-S3)
3	BR	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R-S2)
4	Y	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R-S1)
5	G	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R-S4)
6	L	STEERING ANGLE MAIN MOTOR RESOLVER SIGNAL (R-S2)

Connector No.	E94
Connector Name	SUB MOTOR ANGLE SENSOR
Connector Type	RH06FB



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R-S4)
2	R	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R-S3)
3	BR	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R-S2)
4	Y	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R-S1)
5	G	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R-S4)
6	L	STEERING ANGLE SUB MOTOR RESOLVER SIGNAL (R-S2)

Connector No.	E95
Connector Name	STEERING TORQUE SENSOR
Connector Type	SAZ04FGY



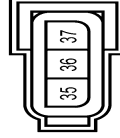
Terminal No.	Color Of Wire	Signal Name [Specification]
1	P	TORQUE SENSOR GROUND
2	BR	TORQUE SENSOR POWER SUPPLY
3	LG	TORQUE SENSOR SUB SIGNAL
4	SB	TORQUE SENSOR MAIN SIGNAL

Connector No.	E96
Connector Name	WIRE TO WIRE
Connector Type	RH12MB



Terminal No.	Color Of Wire	Signal Name [Specification]
1	P	-
2	SHIELD	-
3	SHIELD	-
4	W	-
5	R	-
6	BR	-
7	BR	-
8	SB	-
9	LG	-
10	G	-
11	Y	-
12	L	-

Connector No.	E97
Connector Name	STEERING ANGLE MAIN CONTROL MODULE
Connector Type	Y03FB-L



Terminal No.	Color Of Wire	Signal Name [Specification]
35	B	STEERING ANGLE MAIN MOTOR U-PHASE
36	W	STEERING ANGLE MAIN MOTOR V-PHASE
37	W/L	STEERING ANGLE MAIN MOTOR W-PHASE

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DIRECT ADAPTIVE STEERING

[DIRECT ADAPTIVE STEERING]

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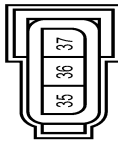
DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	E98
Connector Name	STEERING ANGLE MAIN CONTROL MODULE
Connector Type	IP01FB-A



Terminal No.	Color Of Wire	Signal Name [Specification]
38	SHIELD	GROUND

Connector No.	E99
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	Y03FB-L



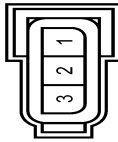
Terminal No.	Color Of Wire	Signal Name [Specification]
35	B	STEERING ANGLE SUB MOTOR U-PHASE
36	W	STEERING ANGLE SUB MOTOR V-PHASE
37	W/L	STEERING ANGLE SUB MOTOR W-PHASE

Connector No.	E100
Connector Name	STEERING ANGLE SUB CONTROL MODULE
Connector Type	P01FB-A



Terminal No.	Color Of Wire	Signal Name [Specification]
38	SHIELD	GROUND

Connector No.	E105
Connector Name	STEERING ANGLE MAIN MOTOR
Connector Type	Y03FB-L



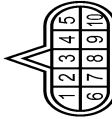
Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	STEERING ANGLE MAIN MOTOR U-PHASE
2	W/L	STEERING ANGLE MAIN MOTOR W-PHASE
3	W	STEERING ANGLE MAIN MOTOR V-PHASE

Connector No.	F2
Connector Name	A/T ASSEMBLY
Connector Type	RK10FG-D5Y



Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	IGNITION POWER SUPPLY
2	P	BATTERY POWER SUPPLY (MEMORY BACKUP)
3	L	CAN-H
4	LG	K-LINE
5	B	GROUND
6	GR	IGNITION POWER SUPPLY
7	BG	BACK-UP LAMP RELAY
8	P	CAN-L
9	GR	STARTER RELAY
10	B	GROUND

Connector No.	F100
Connector Name	TCM
Connector Type	SF10FG



Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	IGNITION POWER SUPPLY
2	-	BATTERY POWER SUPPLY (MEMORY BACKUP)
3	-	CAN-H
4	-	K-LINE
5	-	GROUND
6	-	IGNITION POWER SUPPLY
7	-	BACK-UP LAMP RELAY
8	-	CAN-L
9	-	STARTER RELAY
10	-	GROUND

Connector No.	M14
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FB-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
48	R	PUSH-BTN IGN SW ILL PWR
49	R	DONGLE LINK
52	G	COMM LINE
54	V	RAIN SENSOR
55	R	CAN-L
59	P	CAN-H
60	L	CAN-H
61	G	REAR WINDOW DEF RLY CONT
62	R	STARTER RLY CONT
64	V	I-KEY WARN BUZZER
65	B	OUTS HD LAMP CONT
66	B	BLOWER FAN RLY CONT
67	W/B	IGN RLYAY (F/B) CONT
68	R	DIMMER
69	GR	A/T SHIFT SELECT PWR SPL Y
70	B	IGN RLYAY (P/EM/ER) CONT
71	G	DR DOOR REG SW
72	SB	PASS DOOR REG SW
75	BR	COMBI SW INPUT 4
76	BG	COMBI SW INPUT 5
77	V	COMBI SW INPUT 3
78	Y	COMBI SW INPUT 2
79	LG	COMBI SW INPUT 1
80	L	TR LID OPNR SW

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DIRECT ADAPTIVE STEERING

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[DIRECT ADAPTIVE STEERING]

DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	M24
Connector Name	CAN GATEWAY
Connector Type	TH12FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	CAN-H
3	W	BATTERY
4	L	CAN-H
5	B	GND
6	L	CAN-H
7	P	CAN-L
9	R	IGN
10	R	CAN-L
11	B	GND
12	R	CAN-L

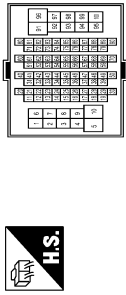
Connector No.	M37
Connector Name	ECM
Connector Type	RI24FY-R28-RLHZ



Terminal No.	Color Of Wire	Signal Name [Specification]
97	Y	ACCELERATOR PEDAL POSITION SENSOR 1
98	BR	ACCELERATOR PEDAL POSITION SENSOR 2
99	W	SENSOR SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 1)
100	G	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)
101	SB	ASD/ICC STEERING SWITCH
102	LG	EVAP CONTROL SYSTEM PRESSURE SENSOR
103	L	SENSOR SUPPLY (EVAP CONTROL SYSTEM PRESSURE SENSOR)
104	R	SENSOR GROUND (EVAP CONTROL SYSTEM PRESSURE SENSOR)
105	L	REFRIGERANT PRESSURE SENSOR
106	P	FUEL TANK TEMPERATURE SENSOR

107	GR	SENSOR GROUND (ASD/ICC STEERING SWITCH)
108	Y	SENSOR GROUND (ASD/ICC STEERING SWITCH)
109	BR	TRANSMISSION RANGE SWITCH
110	V	ENGINE SPEED SIGNAL OUTPUT
111	V	GND (PPRES/PTRES)
112	P	CAN COMMUNICATION LINE
114	L	CAN COMMUNICATION LINE
117	V	DATA LINK CONNECTOR
121	LG	EVAP CANISTER VENT CONTROL VALVE
122	SB	STOP LAMP SWITCH
123	B	ECM GROUND
124	B	ECM GROUND
125	R	POWER SUPPLY FOR ECM
126	BG	BRAKE PEDAL POSITION SWITCH
127	B	ECM GROUND
128	B	ECM GROUND

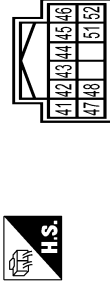
Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Type	TH10MW-CS16-TM4



Terminal No.	Color Of Wire	Signal Name [Specification]
2	GR	-
3	L	-
4	V	-
6	W/B	-
7	V	-
10	W	-
11	W	-
12	B	-
13	GR	-
14	B	-
15	SB	-
16	B	-
17	LG	-
18	B	-
31	W	-
32	V	-
35	BG	-
36	G	-

37	B	-
38	L	-
39	Y	-
40	GR	-
41	L	-
44	BR	-
45	W	-
46	G	-
47	R	-
48	SHIELD	-
49	B	-
50	BR	-
51	L	-
52	W	-
53	G	-
54	Y	-
55	P	-
56	BG	-
57	GR	-
58	B	-
59	SB	-
61	W/B	-
62	SB	-
63	LG	-
64	Y	-
65	R	-
66	V	-
67	LG	-
68	BG	-
71	V	-
72	LG	-
73	R	-
74	BR	-
75	B	-
78	G	-
79	R	-
83	R	-
86	V	-
91	W	-
92	R	-
94	BG	-
95	BR	-
96	W	-
97	LG	-
98	Y	-
99	BR	-
100	SHIELD	-

Connector No.	M58
Connector Name	COMBINATION METER
Connector Type	TH12FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
41	L	CAN-H
42	P	CAN-L
43	B	ILLUMINATION CONTROL SIGNAL
44	Y	FUEL LEVEL SENSOR GROUND
45	W	BATTERY POWER SUPPLY
46	R	IGNITION SIGNAL
47	LG	AV COMMUNICATION SIGNAL (H)
48	SB	AV COMMUNICATION SIGNAL (L)
51	BR	FUEL LEVEL SENSOR SIGNAL
52	B	GROUND

Connector No.	M71
Connector Name	STEERING FORCE CONTROL MODULE
Connector Type	RI24FB-R28-LRH



Terminal No.	Color Of Wire	Signal Name [Specification]
2	Y	STEERING FORCE MOTOR RESOLVER SIGNAL (R1-S3)
4	W	STEERING FORCE MOTOR RESOLVER SIGNAL (R1-S3)
5	G	STEERING FORCE MOTOR RESOLVER SIGNAL (R2-S4)
6	L	STEERING FORCE MOTOR RESOLVER SIGNAL (R2-S4)
10	B	STEERING FORCE MOTOR RESOLVER SIGNAL (R1-S2)
11	R	STEERING FORCE MOTOR RESOLVER SIGNAL (R1-S2)
14	L	CAN COMMUNICATION-H
15	P	CAN COMMUNICATION-L [Without Gateway]
16	R	CAN COMMUNICATION-L [With Gateway]
17	Y	BACK UP SIGNAL (FROM STEERING ANGLE SWM CONTROL MODULE)

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DIRECT ADAPTIVE STEERING

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[DIRECT ADAPTIVE STEERING]

DIRECT ADAPTIVE STEERING SYSTEM

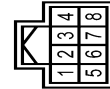
18	Y	BACK-UP SIGNAL (FOR STEERING ANGLE SUB CONTROL MODULE)
19	W	FLEXRAY COMMUNICATION-H
20	V	FLEXRAY COMMUNICATION-L
22	BG	BACK-UP SIGNAL (FOR STEERING ANGLE SUB CONTROL MODULE)
23	BR	CAN WAKE UP
24	R	BACK-UP SIGNAL (FOR STEERING ANGLE SUB CONTROL MODULE)
25	W	IGNITION POWER SUPPLY
26	R/W	STEERING CLUTCH +
27	W/B	STEERING CLUTCH -
28	R	STEERING CLUTCH -
29	L	FORCE MOTOR TEMPERATURE SENSOR
30	B	GROUND
31	R	FORCE MOTOR TEMPERATURE SENSOR +
32	B	GROUND

Connector No.	M172
Connector Name	STEERING FORCE CONTROL MODULE
Connector Type	Y02FB-1V



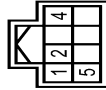
Terminal No.	Color Of Wire	Signal Name [Specification]
33	B	GROUND
34	R	BATTERY POWER SUPPLY

Connector No.	M173
Connector Name	FORCE MOTOR ANGLE SENSOR
Connector Type	TH08FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	STEERING FORCE MOTOR RESOLVER SIGNAL (R1-R2)
2	W	STEERING FORCE MOTOR RESOLVER SIGNAL (S1-S3)
3	R	FORCE MOTOR TEMPERATURE SENSOR +
4	L	STEERING FORCE MOTOR RESOLVER SIGNAL (S2-S4)
5	R	STEERING FORCE MOTOR RESOLVER SIGNAL (R1-R2)
6	Y	STEERING FORCE MOTOR RESOLVER SIGNAL (S1-S3)
7	L	FORCE MOTOR TEMPERATURE SENSOR -
8	G	STEERING FORCE MOTOR RESOLVER SIGNAL (S2-S4)

Connector No.	M177
Connector Name	STEERING ANGLE SENSOR
Connector Type	TH08FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GROUND
2	P	CAN-L [Without Gateway]
2	R	CAN-L [With Gateway]
4	G	IGN
5	L	CAN-H

Connector No.	M195
Connector Name	WIRE TO WIRE
Connector Type	TH16MW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-
2	BR	-
3	BR	-

5	P	- [Without Gateway]
5	R	- [With Gateway]
6	Y	-
7	P	- [Without Gateway]
7	R	- [With Gateway]
9	R/W	-
10	R	-
11	SHIELD	-
13	L	-
14	L	-
15	L	-

Connector No.	M117
Connector Name	WIRE TO WIRE
Connector Type	L01MB-MC



Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-

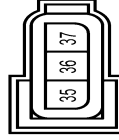
Connector No.	M133
Connector Name	FUSE BLOCK (J/B)
Connector Type	TH40FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
10C	V	-
11C	V	-
13C	L	-
14C	Y	-
15C	R	-
16C	R	-

17C	L	-
18C	BG	- [Without DRPO]
18C	P	- [With DRPO]
19C	B	-
20C	W	-
21C	L	-
22C	L	-
23C	L	-
25C	LG	-
26C	SB	-
27C	P	-
28C	W	-
29C	W	-
2C	R	-
30C	R	-
31C	W	-
32C	R	-
33C	B	-
34C	W/B	-
35C	SB	-
36C	R	-
37C	W	-
38C	SB	-
39C	V	-
3C	P	-
40C	G	-
4C	P	-
5C	P	-
6C	G	-
7C	G	-
9C	V	-

Connector No.	M151
Connector Name	STEERING FORCE CONTROL MODULE
Connector Type	Y03FB-R



Terminal No.	Color Of Wire	Signal Name [Specification]
35	B/R	STEERING FORCE MOTOR U-PHASE
36	B/L	STEERING FORCE MOTOR V-PHASE
37	B/G	STEERING FORCE MOTOR W-PHASE



DIRECT ADAPTIVE STEERING

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[DIRECT ADAPTIVE STEERING]



DIRECT ADAPTIVE STEERING SYSTEM

Connector No.	M152
Connector Name	STEERING FORCE CONTROL MODULE
Connector Type	IP01FB-A



Terminal No.	Color Of Wire	Signal Name [Specification]
38	B	GROUND

Connector No.	M153
Connector Name	STEERING FORCE MOTOR
Connector Type	SN403MW



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B/R	STEERING FORCE MOTOR U-PHAZE
2	B/L	STEERING FORCE MOTOR V-PHAZE
3	B/G	STEERING FORCE MOTOR W-PHAZE

Connector No.	M154
Connector Name	STEERING FORCE MOTOR
Connector Type	TH44MW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
5	B	GROUND

Connector No.	M155
Connector Name	WIRE TO WIRE
Connector Type	TH16FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	-
3	R	-
5	P	- [Without Gateway]
5	R	- [With Gateway]
6	Y	- [With ADAS]
7	P	- [Without Gateway]
7	R	- [With Gateway]
9	R/W	-
10	R	-
11	SHIELD	-
13	L	-
14	L	-
15	L	-

Connector No.	M156
Connector Name	STEERING CLUTCH
Connector Type	TH44FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
1	R/W	STEERING CLUTCH +
3	R	STEERING CLUTCH -

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

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DETAILED FLOW

1. INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing [STC-119, "Diagnostic Work Sheet"](#) and reproduce symptoms as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

CAUTION:

Customers are not professional. Never guess easily like “maybe the customer means that...,” or “maybe the customer mentions this symptom”.

>> GO TO 2.

2. CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by protection function. Refer to [STC-51, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

CAUTION:

When the symptom is caused by normal operation, fully inspect each portion and obtain the understanding of customer that the symptom is not caused by a malfunction.

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “EPS/DAST 3”, “DAST 1” and “DAST 2”.

Is any DTC detected?

YES >> Record or print DTC and freeze frame data. GO TO 4.

NO >> GO TO 6.

4. RECHECK SYMPTOM

With CONSULT

1. Erase self-diagnostic results for “EPS/DAST 3”, “DAST 1” or “DAST 2”.

2. Perform DTC confirmation procedures for the error detected system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on [STC-77, "DTC Inspection Priority Chart"](#).

Is any DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-42, "Intermittent Incident"](#).

5. REPAIR OR REPLACE ERROR-DETECTED PARTS

1. Repair or replace error-detected parts.

2. Reconnect part or connector after repairing or replacing.

3. When DTC is detected, erase self-diagnostic results for “EPS/DAST 3”, “DAST 1” or “DAST 2”.

>> GO TO 7.

6. IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

Estimate error-detected system based on symptom diagnosis and perform inspection.

Can the error-detected system be identified?

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to [GI-42](#), "Intermittent Incident".

7. FINAL CHECK

With CONSULT

1. Check the reference value for steering force control module, steering angle main control module or steering angle sub control module.
2. Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom reproduced?

YES >> GO TO 3.

NO >> INSPECTION END

Diagnostic Work Sheet

INFOID:000000011286647

Description

- In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about his/her concerns carefully. To systemize all the information for the diagnosis, prepare the interview sheet referring to the interview points.
- In some cases, multiple conditions that appear simultaneously may cause a DTC to be detected.

Interview sheet sample

STC

Interview sheet					
Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Symptom		<input type="checkbox"/> The steering wheel position (center) is in the wrong position.			
		<input type="checkbox"/> Power steering warning lamp turns on.			
		<input type="checkbox"/> The vehicle pulls to one direction.			
		<input type="checkbox"/> Steering effort fluctuates (<input type="checkbox"/> Not smooth <input type="checkbox"/> Abruptly <input type="checkbox"/> Increased <input type="checkbox"/> Decreased)			
		<input type="checkbox"/> Noise <input type="checkbox"/> Vibration			
		<input type="checkbox"/> Others ()			
First occurrence		<input type="checkbox"/> Recently <input type="checkbox"/> Others ()			
Frequency of occurrence		<input type="checkbox"/> Always <input type="checkbox"/> Under a certain conditions of <input type="checkbox"/> Sometimes (time(s)/day)			
Climate conditions		<input type="checkbox"/> Irrelevant			
		Weather <input type="checkbox"/> Fine <input type="checkbox"/> Cloud <input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> Others ()			
		Temperature <input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold <input type="checkbox"/> Temperature [Approx. °C(°F)]			
		Relative humidity <input type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low			
Road conditions		<input type="checkbox"/> Urban area <input type="checkbox"/> Suburb area <input type="checkbox"/> High way <input type="checkbox"/> Mounting road (uphill or down hill) <input type="checkbox"/> Rough road			
Steering mode settings		Infiniti drive mode selector (), Steering mode setting ()			
Operation conditions, etc.		<input type="checkbox"/> Irrelevant			
		<input type="checkbox"/> When engine starts [Steering wheel angle (°), Tilt level (<input type="checkbox"/> High / <input type="checkbox"/> Mid / <input type="checkbox"/> Low)]			
		<input type="checkbox"/> During driving <input type="checkbox"/> At constant speed driving <input type="checkbox"/> During idling			
		<input type="checkbox"/> During acceleration <input type="checkbox"/> During deceleration			
		<input type="checkbox"/> Traveling straight <input type="checkbox"/> During cornering (right curve or left curve)			
		<input type="checkbox"/> During steering [Steering wheel angle (°), Steering speed (<input type="checkbox"/> High / <input type="checkbox"/> Mid / <input type="checkbox"/> Low), Steering effort (<input type="checkbox"/> Heavy / <input type="checkbox"/> Light)]			
		<input type="checkbox"/> Fully steered right or left (Road condition:)			

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Interview sheet

Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Other conditions					

Memo

ADDITIONAL SERVICE WHEN REMOVING 12V BATTERY NEGATIVE TERMINAL

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

ADDITIONAL SERVICE WHEN REMOVING 12V BATTERY NEGATIVE TERMINAL

Description

INFOID:000000011286648

When removing the 12V battery negative terminal, initialize is required for operating the direct adaptive steering normally.

CAUTION:

When replacing the direct adaptive steering component parts, perform the corresponding work. Refer to [STC-123, "Work Procedure"](#).

Work Procedure

INFOID:000000011286649

1. DIRECT ADAPTIVE STEERING INITIALIZE

1. Set the steering wheel to the straight-ahead position.
2. Connect battery terminal.
3. Start the engine.
CAUTION:
Never drive the vehicle.
4. Turn the steering wheel from full left stop to full right stop.
5. Confirm the condition of turning the steering wheel is normal.

>> WORK END

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ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

Special Repair Requirement

INFOID:000000011286650

x: Applicable

Parts name	Service performed		Required service	Reference
	Re- place- ment	Re- moval		
<ul style="list-style-type: none"> Steering force control module Steering angle main control module Steering angle sub control module 	×	—	<ul style="list-style-type: none"> Configuration for steering force control module Configuration for steering angle main control module Configuration for steering angle sub control module Clutch phase position learning Steering rack neutral position learning Adjustment of steering angle sensor neutral position 	STC-125, "Work Procedure" NOTE: Work procedure is the same as three control modules.
Steering wheel	*1	*1	<ul style="list-style-type: none"> Configuration for steering force control module Configuration for steering angle main control module Configuration for steering angle sub control module Clutch phase position learning Steering rack neutral position learning Adjustment of steering angle sensor neutral position 	STC-123, "Work Procedure"
Steering angle sensor	×	×	<ul style="list-style-type: none"> Configuration for steering force control module Configuration for steering angle main control module Configuration for steering angle sub control module Clutch phase position learning Steering rack neutral position learning Adjustment of steering angle sensor neutral position 	STC-123, "Work Procedure"
<ul style="list-style-type: none"> Steering column assembly Steering clutch assembly Steering upper shaft / Steering lower shaft 	×	×	<ul style="list-style-type: none"> Configuration for steering force control module Configuration for steering angle main control module Configuration for steering angle sub control module Clutch phase position learning Steering rack neutral position learning Adjustment of steering angle sensor neutral position 	STC-123, "Work Procedure"
<ul style="list-style-type: none"> Steering gear assembly Suspension components 	×	×	<ul style="list-style-type: none"> Configuration for steering force control module Configuration for steering angle main control module Configuration for steering angle sub control module Clutch phase position learning Steering rack neutral position learning Adjustment of steering angle sensor neutral position Wheel alignment (toe-in) adjustment with CONSULT 	<ul style="list-style-type: none"> ST-83, "ALIGNMENT TESTER : Inspection and Adjustment" (With alignment tester)

*1: If the neutral position of the steering wheel is different from the straight-ahead status of the vehicle when installing the steering wheel to the same position when it was removed.

ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Work Procedure

INFOID:000000011286651

WARNING:

Never move the vehicle during “DAST CALIBRATION (MODE1)” because the steering gear is held in neutral position until ignition switch is turned OFF.

CAUTION:

- Be careful for the moving parts, steering wheel and front wheels are steered automatically when start “DAST CALIBRATION (MODE1)”.
- Do not rotate road wheels during the DAST calibration because the system is detected the vehicle running.

1. PREPARATION

1. Set the front wheel on the turn table.

NOTE:

Do not lift up the vehicle during “DAST CALIBRATION (MODE1)”

2. Connect the battery charger to protect the battery.

NOTE:

Much electricity is used in “DAST CALIBRATION (MODE1)”.

3. Connect the CONSULT.
4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

>> GO TO 2.

2. ECU CONFIGURATION

With CONSULT

1. Perform configuration for steering force control module. Refer to [STC-130, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

2. Perform configuration for steering angle main control module. Refer to [STC-132, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

3. Perform configuration for steering angle sub control module. Refer to [STC-130, "Work Procedure"](#).

NOTE:

The replacement of control module included in configuration is not required.

>> GO TO 3.

3. DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]

With CONSULT

1. Perform “DAST CALIBRATION (MODE1)”. Refer to [STC-127, "Work Procedure"](#).

2. Turn the ignition switch OFF.

CAUTION:

Be sure to perform this step.

>> GO TO 4.

4. DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING]

With CONSULT

1. Turn the ignition switch ON.

CAUTION:

Never start the engine.

2. Perform “DAST CALIBRATION (MODE1)”. Refer to [STC-127, "Work Procedure"](#).

>> GO TO 5.

5. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Ⓟ With CONSULT

1. On the CONSULT screen, select “ABS”>>“WORK SUPPORT”>>“ST ANGLE SENSOR ADJUSTMENT”.
2. Touch START.

CAUTION:

Never touch steering wheel while adjusting steering angle sensor.

3. After approx. 10 seconds, select “END”.
4. Turn ignition switch OFF, and then turn it ON again.

CAUTION:

Be sure to perform this step.

>> GO TO 6.

6. PERFORM SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Turn ignition switch OFF and wait at least 10 seconds.
 2. Start the engine.
- CAUTION:**
Never drive the vehicle.
3. Perform self-diagnosis for “EPS/DAST 3”, “DAST 1” and “DAST 2”.

Is any DTC detected?

YES >> When other than above DTC is detected, perform Perform trouble diagnosis for the detected DTC. Refer to [STC-79. "DTC Index"](#) (EPS/DAST 3), [STC-92. "DTC Index"](#) (DAST 1), [STC-105. "DTC Index"](#) (DAST 2).

NO >> GO TO 7.

7. FINAL CONFIRMATION

Ⓟ With CONSULT

1. Turn the ignition switch OFF to ON.

CAUTION:

Never start the engine.

2. On the CONSULT screen, select “EPS/DAST 3” >> “DATA MONITOR” >> “ANGLE 1”, and then and then check the value.

Monitor item	Standard value
ANGLE 1	-4.4 ≤ ANGLE 1 ≤ 4.4

Is the confirmation result normal?

YES >> WORK END

NO >> Slightly lower the tilt position, and then re-perform “DAST CALIBRATION (MODE1)”. GO TO 3.

ADDITIONAL SERVICE WHEN REPLACING CONTROL MODULE

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

ADDITIONAL SERVICE WHEN REPLACING CONTROL MODULE

Description

INFOID:000000011286652

When replacing steering force control module, steering angle main control module, or steering angle sub control module, configuration and DAST calibration are required.

Work Procedure

INFOID:000000011286653

WARNING:

Never move the vehicle during "DAST CALIBRATION (MODE1)" because the steering gear is held in neutral position until ignition switch is turned OFF.

CAUTION:

- Be careful for the moving parts, steering wheel and front wheels are steered automatically when start "DAST CALIBRATION (MODE1)".
- Do not rotate road wheels during the DAST calibration because the system is detected the vehicle running.

1. PREPARATION

1. Set the front wheel on the turn table.

NOTE:

Do not lift up the vehicle during "DAST CALIBRATION (MODE1)".

2. Connect the battery charger to protect the battery.

NOTE:

Much electricity is used in "DAST CALIBRATION (MODE1)".

3. Connect the CONSULT.
4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

>> GO TO 2.

2. ECU CONFIGURATION

With CONSULT

1. Perform configuration for steering force control module. Refer to [STC-130. "Work Procedure"](#).
2. Perform configuration for steering angle main control module. Refer to [STC-132. "Work Procedure"](#).
3. Perform configuration for steering angle sub control module. Refer to [STC-130. "Work Procedure"](#).

>> GO TO 3.

3. DAST CALIBRATION (MODE1) [CLUTCH PHASE LEARNING]

With CONSULT

1. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-127. "Work Procedure"](#).
2. Turn the ignition switch OFF.

CAUTION:

Be sure to perform this step.

>> GO TO 4.

4. DAST CALIBRATION (MODE1) [STEERING RACK NEUTRAL POSITION LEARNING]

With CONSULT

1. Turn the ignition switch ON.

CAUTION:

Never start the engine.

2. Perform "DAST CALIBRATION (MODE1)". Refer to [STC-127. "Work Procedure"](#).

>> GO TO 5.

5. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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ADDITIONAL SERVICE WHEN REPLACING CONTROL MODULE

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Ⓟ With CONSULT

1. On the CONSULT screen, select "ABS">>"WORK SUPPORT">>"ST ANGLE SENSOR ADJUSTMENT".
2. Touch START.

CAUTION:

Never touch steering wheel while adjusting steering angle sensor.

3. After approx. 10 seconds, select "END".
4. Turn ignition switch OFF, and then turn it ON again.

CAUTION:

Be sure to perform this step.

>> GO TO 6.

6. PERFORM SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Turn ignition switch OFF and wait at least 10 seconds.
 2. Start the engine.
- CAUTION:**
Never drive the vehicle.
3. Perform self-diagnosis for "EPS/DAST 3", "DAST 1" and "DAST 2".

Is any DTC detected?

YES >> When other than above DTC is detected, perform Perform trouble diagnosis for the detected DTC. Refer to [STC-79. "DTC Index"](#) (EPS/DAST 3), [STC-92. "DTC Index"](#) (DAST 1), [STC-105. "DTC Index"](#) (DAST 2).

NO >> GO TO 7.

7. FINAL CONFIRMATION

Ⓟ With CONSULT

1. Turn the ignition switch OFF to ON.

CAUTION:

Never start the engine.

2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "ANGLE 1", and then and then check the value.

Monitor item	Standard value
ANGLE 1	-4.4 ≤ ANGLE 1 ≤ 4.4

Is the confirmation result normal?

YES >> WORK END

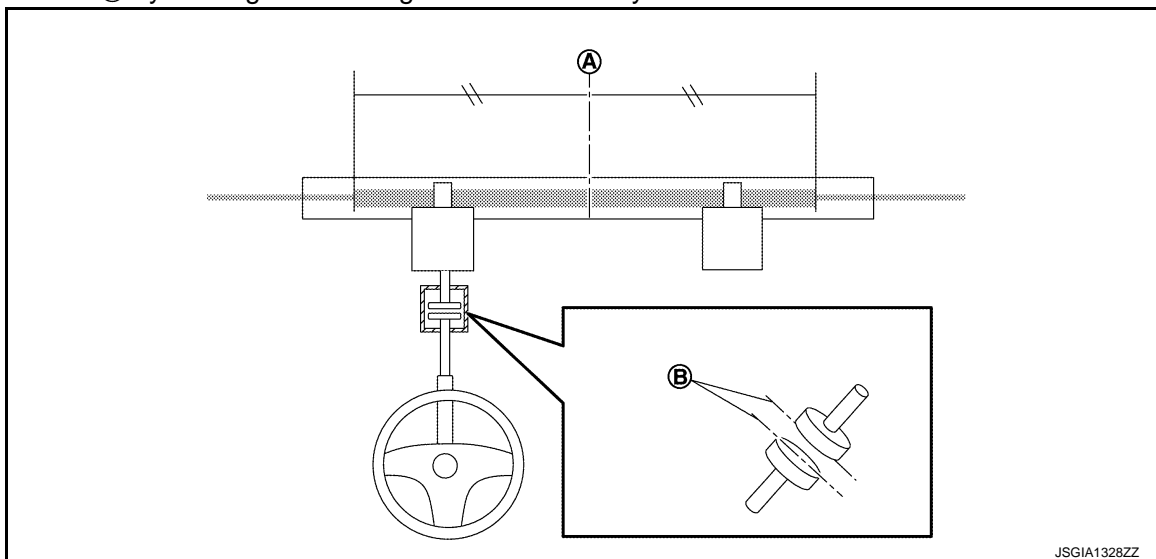
NO >> Slightly lower the tilt position, and then re-perform "DAST CALIBRATION (MODE1)". GO TO 3.

DAST CALIBRATION (MODE1)

Description

INFOID:0000000011286654

“DAST CALIBRATION (MODE1)” is a function to learn the neutral position of steering rack (A) and the clutch phase position (B) by moving the steering rack automatically.



JSGIA1328ZZ

Work Procedure

INFOID:0000000011286655

WARNING:

- Never move the vehicle during “DAST CALIBRATION (MODE1)” because the steering gear is held in neutral position until ignition switch is turned OFF.
- “DAST CALIBRATION (MODE1)” is additional service when removing/installing/replacing DAST parts or adjusting wheel alignment. “DAST CALIBRATION (MODE1)” is used in [Clutch phase learning] and [Steering rack neutral learning]. Using it incorrectly cause off-center. Refer to “ADDITIONAL SERVICE WHEN REPLACING OR REMOVING DAST PARTS”(Refer to [STC-123, "Work Procedure"](#).) and “TOE-IN ADJUSTMENT” (Refer to [ST-83, "ALIGNMENT TESTER : Inspection and Adjustment"](#).) before performing it.
- Since the force feedback of steering becomes smaller after the completion of auto steering, take good care for turning the steering. Also, do not turn the steering beyond 120 degrees.

CAUTION:

- Be careful for the moving parts, steering wheel and front wheels are steered automatically when start “DAST CALIBRATION (MODE1)”.
- Do not rotate road wheels during the DAST calibration because the system is detected the vehicle running.

1. PREPARATION BEFORE DAST CALIBRATION

1. Set the front wheel on the turn table.

NOTE:

Do not lift up the vehicle during “DAST CALIBRATION (MODE1)”

2. Check that inner socket length is in the specified value. Refer to [ST-110, "Steering Gear and Linkage"](#).
3. Connect the battery charger to protect the battery.

NOTE:

Much electricity is used in “DAST CALIBRATION (MODE1)”.

4. Place the tilt to the highest level.

>> GO TO 2.

2. DAST CALIBRATION (MODE1)

Ⓜ With CONSULT

1. Erase self-diagnostic result for “EPS/DAST 3”, “DAST 1” and “DAST 2”.

DAST CALIBRATION (MODE1)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

2. On the CONSULT screen, select "EPS/DAST 3" >> "WORK SUPPORT" >> "DAST CALIBRATION (MODE1)".
3. Touch "START".

CAUTION:

Be careful for the moving parts, steering wheel and front wheels are steered automatically when touch "START".

NOTE:

When "DAST CALIBRATION (MODE1)" is completed, the clutch is released.

4. After checking that the power steering warning lamp turns off, turn the steering wheel to the straight-ahead position. Then touch "START".

CAUTION:

- **Be careful in turning the steering wheel to the straight-ahead position.**
- **Since the force feedback of steering becomes smaller after the completion of auto steering, take good care for turning the steering. Also, do not turn the steering beyond 120 degrees.**

NOTE:

The clutch is engaged and then the steering shaft connects to steering gear.

5. Touch "END".

CAUTION:

Never turn the ignition switch OFF.

>> WORK END

DAST CALIBRATION (MODE2)

Description

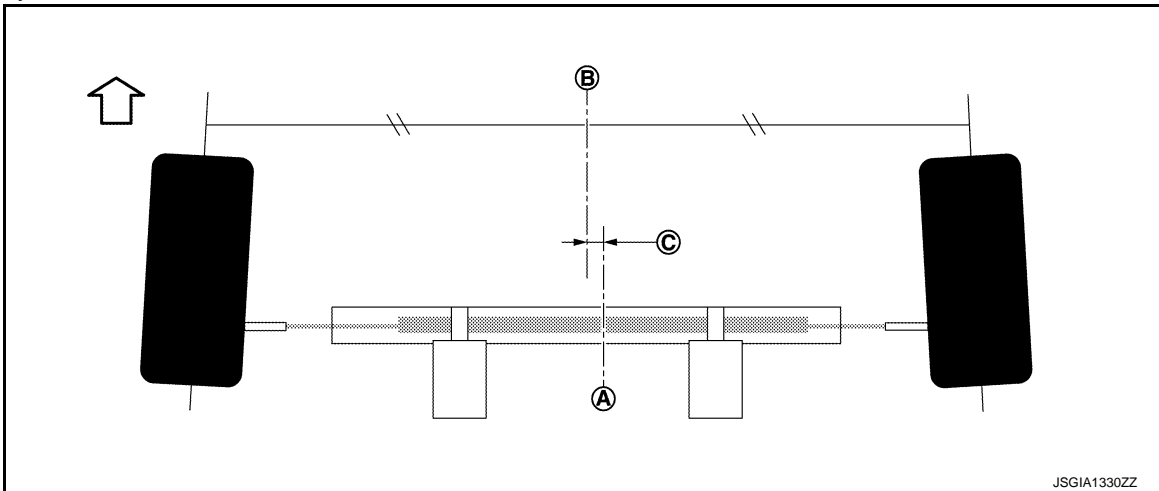
INFOID:000000011286656

“DAST CALIBRATION (MODE2)” is a function to calculate an off-center of the steering rack after adjust toe-in without using the alignment tester.

Off-center © is calculated by the difference between a neutral position of the vehicle’s alignment (A) and the neutral position of the steering rack (B).

CAUTION:

When adjusting toe-in without using the alignment tester, always perform “DAST CALIBRATION (MODE2)”.



Work Procedure

INFOID:000000011286657

Toe-in adjustment: Refer to [ST-85. "EXCEPT ALIGNMENT TESTER : Inspection and Adjustment"](#).

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CONFIGURATION (STEERING FORCE CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

CONFIGURATION (STEERING FORCE CONTROL MODULE)

Work Procedure

INFOID:000000011286658

CAUTION:

- Use “Manual Configuration” only when “TYPE ID” of steering force control module cannot be read.
- If an error occurs during configuration, start over from the beginning.

1. CHECKING TYPE ID (1)

Use FAST (service parts catalogue) to search steering force control module of the applicable vehicle and find “Type ID”.

Is “Type ID” displayed?

YES >> Print out “Type ID” and GO TO 2.

NO >> “Configuration” is not required for steering force control module. Replace in the usual manner.
Refer to [STC-418, "Removal and Installation"](#).

2. CHECKING TYPE ID (2)

ⓑCONSULT Configuration

1. Select “Before Replace ECU” of “Read/Write Configuration”.
2. Check that “Type ID” is displayed on the CONSULT screen.

Is “Type ID” displayed?

YES >> GO TO 3.

NO >> GO TO 7.

3. VERIFYING TYPE ID (1)

ⓑCONSULT Configuration

Compare a “Type ID” displayed on the CONSULT screen with the one searched by using FAST (service parts catalogue) to check that these “Type ID” agree with each other.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 4.

4. SAVING TYPE ID

ⓑCONSULT Configuration

Save “Type ID” on CONSULT.

>> GO TO 5.

5. REPLACING STEERING FORCE CONTROL MODULE (1)

Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 6.

6. WRITING (AUTOMATIC WRITING)

ⓑCONSULT Configuration

1. Select “After Replace ECU” of “Re/programming, Configuration” or that of “Read / Write Configuration”.
2. Select the “Type ID” agreeing with the one stored on CONSULT and the one searched by using FAST (service parts catalogue) to write the “Type ID” into the steering force control module.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 9.

7. REPLACING STEERING FORCE CONTROL MODULE (2)

CONFIGURATION (STEERING FORCE CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 8.

8. WRITING (MANUAL WRITING)

Ⓜ CONSULT Configuration

1. Select "Manual Configuration".
2. Select the "Type ID" searched by using FAST (service parts catalogue) to write the "Type ID" into the steering force control module.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> GO TO 9.

9. VERIFYING TYPE ID (2)

Compare "Type ID" written into the steering force control module with the one searched by using FAST (service parts catalogue) to check that these "Type ID" agree with each other.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> WORK END.

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CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)

Work Procedure

INFOID:000000011286659

CAUTION:

- Use “Manual Configuration” only when “TYPE ID” of steering angle main control module cannot be read.
- If an error occurs during configuration, start over from the beginning.

1. CHECKING TYPE ID (1)

Use FAST (service parts catalogue) to search steering angle main control module of the applicable vehicle and find “Type ID”.

Is “Type ID” displayed?

YES >> Print out “Type ID” and GO TO 2.

NO >> “Configuration” is not required for steering angle main control module. Replace in the usual manner. Refer to [STC-419, "Removal and Installation"](#).

2. CHECKING TYPE ID (2)

ⓐCONSULT Configuration

1. Select “Before Replace ECU” of “Read/Write Configuration”.
2. Check that “Type ID” is displayed on the CONSULT screen.

Is “Type ID” displayed?

YES >> GO TO 3.

NO >> GO TO 7.

3. VERIFYING TYPE ID (1)

ⓐCONSULT Configuration

Compare a “Type ID” displayed on the CONSULT screen with the one searched by using FAST (service parts catalogue) to check that these “Type ID” agree with each other.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 4.

4. SAVING TYPE ID

ⓐCONSULT Configuration

Save “Type ID” on CONSULT.

>> GO TO 5.

5. REPLACING STEERING ANGLE MAIN CONTROL MODULE (1)

Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 6.

6. WRITING (AUTOMATIC WRITING)

ⓐCONSULT Configuration

1. Select “After Replace ECU” of “Re/programming, Configuration” or that of “Read / Write Configuration”.
2. Select the “Type ID” agreeing with the one stored on CONSULT and the one searched by using FAST (service parts catalogue) to write the “Type ID” into the steering angle main control module.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 9.

7. REPLACING STEERING ANGLE MAIN CONTROL MODULE (2)

CONFIGURATION (STEERING ANGLE MAIN CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 8.

8. WRITING (MANUAL WRITING)

Ⓜ CONSULT Configuration

1. Select "Manual Configuration".
2. Select the "Type ID" searched by using FAST (service parts catalogue) to write the "Type ID" into the steering angle main control module.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> GO TO 9.

9. VERIFYING TYPE ID (2)

Compare "Type ID" written into the steering angle main control module with the one searched by using FAST (service parts catalogue) to check that these "Type ID" agree with each other.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> WORK END.

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CONFIGURATION (STEERING ANGLE SUB CONTROL MODULE)

Work Procedure

INFOID:000000011286660

CAUTION:

- Use “Manual Configuration” only when “TYPE ID” of steering angle sub control module cannot be read.
- If an error occurs during configuration, start over from the beginning.

1. CHECKING TYPE ID (1)

Use FAST (service parts catalogue) to search steering angle sub control module of the applicable vehicle and find “Type ID”.

Is “Type ID” displayed?

YES >> Print out “Type ID” and GO TO 2.

NO >> “Configuration” is not required for steering angle sub control module. Replace in the usual manner. Refer to [STC-420, "Removal and Installation"](#).

2. CHECKING TYPE ID (2)

ⓐ CONSULT Configuration

1. Select “Before Replace ECU” of “Read/Write Configuration”.
2. Check that “Type ID” is displayed on the CONSULT screen.

Is “Type ID” displayed?

YES >> GO TO 3.

NO >> GO TO 7.

3. VERIFYING TYPE ID (1)

ⓐ CONSULT Configuration

Compare a “Type ID” displayed on the CONSULT screen with the one searched by using FAST (service parts catalogue) to check that these “Type ID” agree with each other.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 4.

4. SAVING TYPE ID

ⓐ CONSULT Configuration

Save “Type ID” on CONSULT.

>> GO TO 5.

5. REPLACING STEERING ANGLE SUB CONTROL MODULE (1)

Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 6.

6. WRITING (AUTOMATIC WRITING)

ⓐ CONSULT Configuration

1. Select “After Replace ECU” of “Re/programming, Configuration” or that of “Read / Write Configuration”.
2. Select the “Type ID” agreeing with the one stored on CONSULT and the one searched by using FAST (service parts catalogue) to write the “Type ID” into the steering angle sub control module.

NOTE:

For the “Type ID” searched by using FAST (service parts catalog), use the last five digits of the “Type ID”.

>> GO TO 9.

7. REPLACING STEERING ANGLE SUB CONTROL MODULE (2)

CONFIGURATION (STEERING ANGLE SUB CONTROL MODULE)

< BASIC INSPECTION >

[DIRECT ADAPTIVE STEERING]

Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

CAUTION:

Replace the control module only when necessary.

>> GO TO 8.

8. WRITING (MANUAL WRITING)

Ⓜ CONSULT Configuration

1. Select "Manual Configuration".
2. Select the "Type ID" searched by using FAST (service parts catalogue) to write the "Type ID" into the steering angle sub control module.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> GO TO 9.

9. VERIFYING TYPE ID (2)

Compare "Type ID" written into the steering angle sub control module with the one searched by using FAST (service parts catalogue) to check that these "Type ID" agree with each other.

NOTE:

For the "Type ID" searched by using FAST (service parts catalog), use the last five digits of the "Type ID".

>> WORK END.

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STC

DTC/CIRCUIT DIAGNOSIS

C13A0-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286661

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A0-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected when the system is performing the initial setting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Variable

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-136, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286662

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A0-00" detected?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1

C13A0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000011286663

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A0-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected when the system is performing the initial setting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Variable

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13A0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-138, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286664

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13A0-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286665

DTC DETECTION LOGIC

C13A0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A0-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected when the system is performing the initial setting.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Variable

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13A0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-138, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286666

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13A0-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13A1-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286667

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A1-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.

POSSIBLE CAUSE

- Steering force control module

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A1-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-139, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286668

1. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A1-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286669

DTC DETECTION LOGIC

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C13A1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A1-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13A1-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-140, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286670

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 1".

Is DTC "C13A1-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286671

DTC DETECTION LOGIC

C13A1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A1-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13A1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-141, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286672

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 2".

Is DTC "C13A1-00" detected?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13A2-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286673

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A2-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle main control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-142. "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286674

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A2-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-419. "Removal and Installation"](#).
 NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

C13A2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000011286675

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A2-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle main control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Turn the steering wheel from full left stop to full right stop.
- Return the steering wheel to the straight-ahead position.
- Perform self-diagnosis for "DAST 1".

Is DTC "C13A2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-143, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286676

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "DAST 1".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

Never drive the vehicle.

- Turn the steering wheel from full left stop to full right stop.
- Return the steering wheel to the straight-ahead position.
- Perform self-diagnosis for "DAST 1".

Is DTC "C13A2-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286677

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A2-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle main control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
- CAUTION:**
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
 3. Return the steering wheel to the straight-ahead position.
 4. Perform self-diagnosis for "DAST 2".

Is DTC "C13A2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-144, "DAST 2 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286678

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
 2. Erase self-diagnosis for "DAST 2".
 3. Turn the ignition switch OFF and wait for at least 10 seconds.
 4. Start the engine.
- CAUTION:**
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
 6. Return the steering wheel to the straight-ahead position.
 7. Perform self-diagnosis for "DAST 2".

Is DTC "C13A2-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
 NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13A3-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286679

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A3-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle sub control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-142, "EPS/DAST 3 : Diagnosis Procedure"](#).


NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286680

1. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A3-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1

C13A3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000011286681

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A3-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle sub control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13A3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-146, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286682

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 1".

Is DTC "C13A3-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

C13A3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2 : DTC Description

INFOID:000000011286683

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A3-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering angle sub control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13A3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-147, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286684

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 2".

Is DTC "C13A3-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13A4-00 CONTROL MODULE

DAST 1

DAST 1 : DTC Description

INFOID:000000011286685

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A4-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
 - CAUTION:**
 - Never drive the vehicle.**
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13A4-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-148, "DAST 1 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286686

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
 - CAUTION:**
 - Never drive the vehicle.**
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 1".

Is DTC "C13A4-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286687

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A4-00	CONTROL MODULE (Control module)	Malfunction of calculation result in steering force control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13A4-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-149, "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286688

1. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 2".

Is DTC "C13A4-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13A5-00 CONTROL MODULE

DAST 2

DAST 2 : DTC Description

INFOID:000000011286689

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A5-00	CONTROL MODULE (Control module)	The internal malfunction in steering angle sub control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
CAUTION:
Confirm the turning the steering wheel correctly by eyes.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13A5-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-150. "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286690

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Turn the steering wheel from full left stop to full right stop.
6. Return the steering wheel to the straight-ahead position.
7. Perform self-diagnosis for "DAST 2".

Is DTC "C13A5-00" detected?

- YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

C13A5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

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C13A6-00 CONTROL MODULE

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286691

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A6-00	CONTROL MODULE (Control module)	When system is in fail-safe mode (mode 2), the internal malfunction in steering angle main control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
- CAUTION:**
Never drive the vehicle.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13A6-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-152. "DAST 1 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000011286692

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13A6-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-419. "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13A7-00 CONTROL MODULE

DAST 1

DAST 1 : DTC Description

INFOID:000000011286693

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A7-00	CONTROL MODULE (Control module)	When system is in fail-safe mode (mode 2), the internal malfunction in steering angle main control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 **With CONSULT**

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13A7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-153. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286694

1. PERFORM SELF-DIAGNOSIS

 **With CONSULT**

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13A7-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13A8-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13A8-00 BACK UP CIRCUIT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286695

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A8-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none">Terminal voltage < 0.5 V5 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering force control module and steering angle main control module) is open or short.
- Steering force control module
- Steering angle main control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-154. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286696

1. CHECK STEERING FORCE CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "BACK UP SIG 1 VOLT".
3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 1 VOLT	0.5 – 5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

C13A8-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2. CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between both control module harness connectors.

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	17	E26	24	Existed

3. Check the continuity between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	17	Ground	Not existed

Is the inspection result normal?

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

3. PERFORM SELF-DIAGNOSIS

 **With CONSULT**

1. Connect each control module harness connector.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "DAST 1".

Is any DTC is detected?

- YES >> Check the DTC. Refer to [STC-92, "DTC Index"](#).
 NO >> GO TO 4.

4. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000011286697

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A8-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. • Terminal voltage < 0.5 V • 5 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering angle main control module and steering angle sub control module) is open or short.
- Steering angle main control module
- Steering angle sub control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

C13A8-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13A8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-156, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286698

1. CHECK STEERING ANGLE MAIN CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.

2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "BACK UP SIG 1 VOLT".

3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 1 VOLT	0.5 – 5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2. CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.

2. Check the continuity between both control module harness connectors.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	17	E29	22	Existed

3. Check the continuity between steering force control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	17	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Connect each control module harness connector.

2. Start the engine.

CAUTION:

Never drive the vehicle.

C13A8-00 BACK UP CIRCUIT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

3. Perform self-diagnosis for "DAST 2".

Is any DTC is detected?

- YES >> Check the DTC. Refer to [STC-105, "DTC Index"](#).
- NO >> GO TO 4.

4.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

DAST 2

DAST 2 : DTC Description

INFOID:000000011286699

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A8-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none">• Terminal voltage < 0.5 V• 5 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering angle sub control module and steering angle main control module) is open or short.
- Steering angle sub control module
- Steering angle main control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13A8-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-157, "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286700

1.CHECK STEERING ANGLE SUB CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "BACK UP SIG 1 VOLT".

C13A8-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 1 VOLT	0.5 – 5 V

Is the inspection result normal?

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

2.CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between both control module harness connectors.

Steering angle sub control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	17	E26	24	Existed

3. Check the continuity between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	17	Ground	Not existed

Is the inspection result normal?

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

3.PERFORM SELF-DIAGNOSIS

 **With CONSULT**

1. Connect each control module harness connector.
2. Start the engine.
CAUTION:
Never drive the vehicle.
3. Perform self-diagnosis for "DAST 1".

Is any DTC is detected?

- YES >> Check the DTC. Refer to [STC-92. "DTC Index"](#).
- NO >> GO TO 4.

4.CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

C13A9-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13A9-00 BACK UP CIRCUIT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286701

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A9-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none"> Terminal voltage < 0.5 V 5 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering force control module and steering angle sub control module) is open or short.
- Steering force control module
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13A9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-159, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [Gl-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286702

1. CHECK STEERING FORCE CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "BACK UP SIG 2 VOLT".
3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 2 VOLT	0.5 – 5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

C13A9-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2. CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between both control module harness connectors.

Steering force control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	18	E29	24	Existed

3. Check the continuity between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	18	Ground	Not existed

Is the inspection result normal?

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

3. PERFORM SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Connect each control module harness connector.
2. Start the engine.
3. Perform self-diagnosis for "DAST 2".

CAUTION:

Never drive the vehicle.

Is any DTC is detected?

- YES >> Check the DTC. Refer to [STC-105, "DTC Index"](#).
 NO >> GO TO 4.

4. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000011286703

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A9-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none"> • Terminal voltage < 0.5 V • 5 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering angle main control module and steering force control module) is open or short.
- Steering angle main control module
- Steering force control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

C13A9-00 BACK UP CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
- CAUTION:**
Never drive the vehicle.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13A9-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-161, "DAST 1 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286704

1. CHECK STEERING FORCE CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "BACK UP SIG 2 VOLT".
3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 2 VOLT	0.5 – 5 V

Is the inspection result normal?

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

2. CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between both control module harness connectors.

Steering angle main control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	18	M71	22	Existed

3. Check the continuity between steering force control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	18	Ground	Not existed

Is the inspection result normal?

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

3. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Connect each control module harness connector.
2. Start the engine.

CAUTION:
Never drive the vehicle.

C13A9-00 BACK UP CIRCUIT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

3. Perform self-diagnosis for “EPS/DAST 3”.

Is any DTC is detected?

- YES >> Check the DTC. Refer to [STC-79, "DTC Index"](#).
- NO >> GO TO 4.

4.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

DAST 2

DAST 2 : DTC Description

INFOID:000000011286705

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13A9-00	BACK UP CIRCUIT (Back up circuit)	The signal voltage of back up circuit is following condition for 1 second or more continuously. <ul style="list-style-type: none">• Terminal voltage < 0.5 V• 5 V < Terminal voltage

POSSIBLE CAUSE

- Back up circuit (between steering angle sub control module and steering force control module) is open or short.
- Steering angle sub control module
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

ⓅWith CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for “DAST 2”.

Is DTC “C13A9-00” detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-162, "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286706

1.CHECK STEERING FORCE CONTROL MODULE SIGNAL

ⓅWith CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select “DAST 2” >> “DATA MONITOR” >> “BACK UP SIG 2 VOLT”.

C13A9-00 BACK UP CIRCUIT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

3. Check the value

Monitor item	Standard value (Approx.)
BACK UP SIG 2 VOLT	0.5 – 5 V

Is the inspection result normal?

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

2.CHECK THE BACK UP SIGNAL CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between both control module harness connectors.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	18	M71	24	Existed

3. Check the continuity between steering force control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	18	Ground	Not existed

Is the inspection result normal?

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

3.PERFORM SELF-DIAGNOSIS

 **With CONSULT**

1. Connect each control module harness connector.
2. Start the engine.
CAUTION:
Never drive the vehicle.
3. Perform self-diagnosis for “EPS/DAST 3”.

Is any DTC is detected?

- YES >> Check the DTC. Refer to [STC-79, "DTC Index"](#).
- NO >> GO TO 4.

4.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

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C13AA-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286707

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AA-00	CONTROL MODULE (Control module)	The inside relay malfunction in control module is detected when the system is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AA-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-164, "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286708

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AA-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
 NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286709

DTC DETECTION LOGIC

C13AA-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AA-00	CONTROL MODULE (Control module)	The inside relay malfunction in control module is detected when the system is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13AA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-165, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286710

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "DAST 1".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13AA-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286711

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AA-00	CONTROL MODULE (Control module)	The inside relay malfunction in control module is detected when the system is starting.

POSSIBLE CAUSE

C13AA-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13AA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-166. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286712

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13AA-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13AB-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13AB-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286713

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AB-00	CONTROL MODULE (Control module)	Steering force control module detects the following status when the system is starting. <ul style="list-style-type: none">• Malfunction of internal relay• Malfunction of each backup circuit• Malfunction of steering clutch circuit• Malfunction of inverter circuit

POSSIBLE CAUSE

- Back up circuit (between steering force control module and steering angle main control module) is open or short.
- Back up circuit (between steering force control module and steering angle sub control module) is open or short.
- Steering clutch circuit
- Steering clutch
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. CHECK DTC PRIORITY

If DTC "C13AB-00" is displayed with DTC "C13A8-00", "C13A9-00" or "C13E0-00", first perform the confirmation procedure (trouble diagnosis) for DTC "C13AB-00".

Is applicable DTC detected?

YES-1 (C13A8-00 is detected)>>Refer to [STC-154, "EPS/DAST 3 : Diagnosis Procedure"](#).

YES-2 (C13A9-00 is detected)>>Refer to [STC-159, "EPS/DAST 3 : Diagnosis Procedure"](#).

YES-3 (C13E0-00 is detected)>>Refer to [STC-343, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> GO TO 2.

2. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 3.

3. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-168, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286714

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AB-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
 NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286715

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AB-00	CONTROL MODULE (Control module)	Steering angle main control module detects the following status when the system is starting. <ul style="list-style-type: none"> • Malfunction of internal relay • Malfunction of each backup circuit • Malfunction of inverter circuit

POSSIBLE CAUSE

- Back up circuit (between steering angle main control module and steering angle sub control module) is open or short.
- Back up circuit (between steering angle main control module and steering force control module) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. CHECK DTC PRIORITY

If DTC "C13AB-00" is displayed with DTC "C13A8-00" or "C13A9-00", first perform the confirmation procedure (trouble diagnosis) for DTC "C13AB-00".

Is applicable DTC detected?

- YES-1 (C13A8-00 is detected)>>Refer to [STC-156, "DAST 1 : Diagnosis Procedure"](#).
 YES-2 (C13A9-00 is detected)>>Refer to [STC-161, "DAST 1 : Diagnosis Procedure"](#).
 NO >> GO TO 2.

2. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 3.

3. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

C13AB-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13AB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-169, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286716

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13AB-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286717

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AB-00	CONTROL MODULE (Control module)	Steering angle sub control module detects the following status when the system is starting. <ul style="list-style-type: none">• Malfunction of internal relay• Malfunction of each backup circuit• Malfunction of inverter circuit

POSSIBLE CAUSE

- Back up circuit (between steering angle sub control module and steering angle main control module) is open or short.
- Back up circuit (between steering angle sub control module and steering force control module) is open or short.
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC "C13AB-00" is displayed with DTC "C13A8-00" or "C13A9-00", first perform the confirmation procedure (trouble diagnosis) for DTC "C13AB-00".

Is applicable DTC detected?

YES-1 (C13A8-00 is detected)>>Refer to [STC-157, "DAST 2 : Diagnosis Procedure"](#).

YES-2 (C13A9-00 is detected)>>Refer to [STC-162, "DAST 2 : Diagnosis Procedure"](#).

NO >> GO TO 2.

2.PRECONDITIONING

C13AB-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 3.

3. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13AB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-170, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286718

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13AB-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13AC-00 CONTROL MODULE

DAST 1

DAST 1 : DTC Description

INFOID:000000011286719

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AC-00	CONTROL MODULE (Control module)	Steering angle main control module detects the following status when the system is starting. <ul style="list-style-type: none"> • Malfunction of internal relay • Malfunction of each backup circuit

POSSIBLE CAUSE

- Back up circuit (between steering angle main control module and steering angle sub control module) is open or short.
- Back up circuit (between steering angle main control module and steering force control module) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC "C13AC-00" is displayed with DTC "C13A8-00" or "C13A9-00", first perform the confirmation procedure (trouble diagnosis) for DTC "C13AC-00".

Is applicable DTC detected?

YES-1 (C13A8-00 is detected)>>Refer to [STC-156, "DAST 1 : Diagnosis Procedure"](#).

YES-2 (C13A9-00 is detected)>>Refer to [STC-161, "DAST 1 : Diagnosis Procedure"](#).

NO >> GO TO 2.

2.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 3.

3.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13AC-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-171, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286720

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".

C13AC-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13AC-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-419. "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13AD-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286721

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AD-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> The internal malfunction in control module is detected. Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AD-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-173. "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286722

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AD-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).
 NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

EPS/DAST 3 : Component Inspection

INFOID:000000011286723

1. CHECK THE MOTOR

1. Turn the ignition switch OFF.

C13AD-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2. Disconnect steering force motor harness connector.
3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	5	Exist
2		
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-92](#), "[Removal and Installation](#)".

DAST 1

DAST 1 : DTC Description

INFOID:000000011286724

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AD-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none">• The internal malfunction in control module is detected.• Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48](#), "[DIRECT ADAPTIVE STEERING : Fail-safe](#)".

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13AD-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-174](#), "[DAST 1 : Diagnosis Procedure](#)".

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42](#), "[Intermittent Incident](#)".

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286725

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.

C13AD-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13AD-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1 : Component Inspection

INFOID:000000011286726

1. CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle main motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	4	Exist
2		
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286727

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AD-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none">• The internal malfunction in control module is detected.• Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 **With CONSULT**

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

C13AD-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is DTC "C13AD-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-176, "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286728

1.PERFORM SELF-DIAGNOSIS

 **With CONSULT**

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13AD-00" detected?

- YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2 : Component Inspection

INFOID:000000011286729

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	4	Exist
2		
3		

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

C13AE-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13AE-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286730

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AE-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-177. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286731

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AE-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286732

DTC DETECTION LOGIC

C13AE-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AE-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13AE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-178, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286733

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13AE-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286734

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AE-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

C13AE-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13AE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-179. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286735

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13AE-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

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STC

C13AF-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286736

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AF-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
- CAUTION:**
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AF-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-180, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286737

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13AF-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286738

DTC DETECTION LOGIC

C13AF-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AF-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13AF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-181, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286739

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "DAST 1".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13AF-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286740

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13AF-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

C13AF-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13AF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-182. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286741

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13AF-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13B0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13B0-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286742

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B0-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-183. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286743

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B0-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286744

DTC DETECTION LOGIC

C13B0-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B0-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13B0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-184, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286745

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B0-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286746

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B0-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

C13B0-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-185. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286747

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B0-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13B1-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286748

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B1-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B1-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-186. "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286749

1. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.
CAUTION:
Never drive the vehicle.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B1-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286750

DTC DETECTION LOGIC

C13B1-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B1-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13B1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-187, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286751

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "DAST 1".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13B1-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286752

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B1-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

C13B1-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-188. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286753

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B1-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13B2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13B2-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286754

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B2-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none">The internal malfunction in control module is detected.Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-189. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286755

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "EPS/DAST 3".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B2-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

EPS/DAST 3 : Component Inspection

INFOID:000000011286756

1. CHECK THE MOTOR

- Turn the ignition switch OFF.

C13B2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2. Disconnect steering force motor harness connector.
3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	5	Exist
2		
3		

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-92](#), "[Removal and Installation](#)".

DAST 1

DAST 1 : DTC Description

INFOID:000000011286757

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B2-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none">• The internal malfunction in control module is detected.• Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48](#), "[DIRECT ADAPTIVE STEERING : Fail-safe](#)".

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13B2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-190](#), "[DAST 1 : Diagnosis Procedure](#)".
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42](#), "[Intermittent Incident](#)".
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286758

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.

C13B2-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B2-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1 : Component Inspection

INFOID:000000011286759

1. CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle main motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	4	Exist
2		
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286760

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B2-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none">• The internal malfunction in control module is detected.• Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 **With CONSULT**

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

C13B2-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is DTC "C13B2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-192, "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286761

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B2-00" detected?

- YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2 : Component Inspection

INFOID:000000011286762

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	4	Exist
2		
3		

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

C13B3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13B3-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286763

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel quickly from full left stop to full right stop.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-193. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286764

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B3-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

C13B3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000011286765

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel quickly from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13B3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-194, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286766

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B3-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286767

DTC DETECTION LOGIC

C13B3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel quickly from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 2".

Is DTC "C13B3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-195, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286768

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B3-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

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C13B4-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286769

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B4-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B4-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-196, "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286770

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B4-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
 NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286771

DTC DETECTION LOGIC

C13B4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B4-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13B4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-197, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286772

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "DAST 1".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13B4-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286773

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B4-00	CONTROL MODULE (Control module)	The internal malfunction is detected when control module is starting.

POSSIBLE CAUSE

C13B4-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-198. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286774

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B4-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13B5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13B5-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286775

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B5-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-199. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286776

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B5-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286777

DTC DETECTION LOGIC

C13B5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B5-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13B5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-200, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286778

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B5-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286779

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B5-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

C13B5-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-201. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286780

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "Cube-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13B6-00 MOTOR CIRCUIT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286781

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B6-00	MOTOR CIRCUIT (Motor circuit)	Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering force motor
- Steering force motor harness connector
- Motor circuit (between steering force control module and steering force motor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
 - CAUTION:**
 - Never drive the vehicle.**
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B6-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-202, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286782

1. CHECK THE MOTOR

Check the steering force motor. Refer to [STC-203, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-92, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering force control module and steering force motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering force motor		Continuity
Connector	Terminal	Connector	Terminal	
M151	35	M153	1	Existed
	36		2	
	37		3	
M152	38	M154	5	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M151	35	Ground	Not existed
	36		
	37		
M152	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000011286783

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering force motor harness connector.
3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	5	Exist
2		
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-92, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286784

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B6-00	MOTOR CIRCUIT (Motor circuit)	Malfunction of motor circuit is detected.

POSSIBLE CAUSE

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C13B6-00 MOTOR CIRCUIT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle main motor
- Steering angle main motor harness connector
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13B6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-204, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286785

1. CHECK THE MOTOR

Check the steering angle main motor. Refer to [STC-205, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering angle main control module and steering angle main motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

Steering angle main control module		Steering angle main motor		Continuity
Connector	Terminal	Connector	Terminal	
E97	35	E88*1 E105*2	1	Existed
	36		3	
	37		2	
E98	38	E89	4	

*1: 2WD models

*2: AWD models

3. Check the continuity between control module harness connector and ground.

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E97	35	Ground	Not existed
	36		
	37		
E98	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:0000000011286786

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle main motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	4	Exist
2		
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:0000000011286787

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B6-00	MOTOR CIRCUIT (Motor circuit)	Malfunction of motor circuit is detected.

POSSIBLE CAUSE

- Steering angle sub motor
- Steering angle sub motor harness connector
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13B6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-206, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286788

1. CHECK THE MOTOR

Check the steering angle sub motor. Refer to [STC-207, "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering angle sub control module and steering angle sub motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

Steering angle sub control module		Steering angle sub motor		Continuity
Connector	Terminal	Connector	Terminal	
E99	35	E90	1	Existed
	36		3	
	37		2	
E100	38	E91 ^{*1} E92 ^{*2}	4	

*1: 2WD models

*2: AWD models

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E99	35	Ground	Not existed
	36		
	37		
E100	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

C13B6-00 MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:000000011286789

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	4	Exist
2		
3		

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-103. "Removal and Installation"](#).

C13B7-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286790

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B7-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-208. "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286791

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B7-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286792

DTC DETECTION LOGIC

C13B7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13B7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-209, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286793

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "DAST 1".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13B7-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286794

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

C13B7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-210. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286795

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B7-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13B8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13B8-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286796

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B8-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-211. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286797

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B8-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286798

DTC DETECTION LOGIC

C13B8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B8-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13B8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-212, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286799

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13B8-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286800

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B8-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

C13B8-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13B8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-213. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286801

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13B8-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

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C13B9-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286802

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B9-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> Malfunction of motor circuit is detected. The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force motor
- Steering force motor harness connector
- Motor circuit (between steering force control module and steering force motor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
 - CAUTION:**
 - Never drive the vehicle.**
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13B9-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-214, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286803

1. CHECK THE MOTOR

Check the steering force motor. Refer to [STC-215, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-92, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering force control module and steering force motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

C13B9-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering force motor		Continuity
Connector	Terminal	Connector	Terminal	
M151	35	M153	1	Existed
	36		2	
	37		3	
M152	38	M154	5	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M151	35	Ground	Not existed
	36		
	37		
M152	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:000000011286804

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering force motor harness connector.
3. Check the continuity between motor connector terminals.

Steering force motor		Continuity
Terminal		
1	5	Exist
2		
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering force motor is malfunction. Replace steering column assembly. Refer to [ST-92, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286805

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B9-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> • Malfunction of motor circuit is detected. • The internal malfunction in control module is detected.

POSSIBLE CAUSE

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STC

C13B9-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle main motor
- Steering angle main motor harness connector
- Motor circuit (between steering angle main control module and steering angle main motor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13B9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-216, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286806

1. CHECK THE MOTOR

Check the steering angle main motor. Refer to [STC-217, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering angle main control module and steering angle main motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

Steering angle main control module		Steering angle main motor		Continuity
Connector	Terminal	Connector	Terminal	
E97	35	E88*1 E105*2	1	Existed
	36		3	
	37		2	
E98	38	E89	4	

*1: 2WD models

*2: AWD models

3. Check the continuity between control module harness connector and ground.

C13B9-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E97	35	Ground	Not existed
	36		
	37		
E98	38		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:0000000011286807

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle main motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle main motor		Continuity
Terminal		
1	4	Exist
2		
3		

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering angle main motor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:0000000011286808

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13B9-00	CONTROL MODULE (Control module)	<ul style="list-style-type: none"> • Malfunction of motor circuit is detected. • The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle sub motor
- Steering angle sub motor harness connector
- Motor circuit (between steering angle sub control module and steering angle sub motor) is open or short.
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

C13B9-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13B9-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-218, "DAST 2 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286809

1. CHECK THE MOTOR

Check the steering angle sub motor. Refer to [STC-219, "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

2. CHECK THE MOTOR CIRCUIT

1. Disconnect steering angle sub control module and steering angle sub motor harness connector.
2. Check the continuity between control module harness connector and motor harness connector.

Steering angle sub control module		Steering angle sub motor		Continuity
Connector	Terminal	Connector	Terminal	
E99	35	E90	1	Existed
	36		3	
	37		2	
E100	38	E91 ^{*1} E92 ^{*2}	4	

*1: 2WD models

*2: AWD models

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E99	35	Ground	Not existed
	36		
	37		
E100	38		

Is the inspection result normal?

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

C13B9-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:000000011286810

1.CHECK THE MOTOR

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub motor harness connector.
3. Check the continuity between motor connector terminals.

Steering angle sub motor		Continuity
Terminal		
1	4	Exist
2		
3		

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Steering angle sub motor is malfunction. Replace steering gear assembly. Refer to [ST-103. "Removal and Installation"](#).

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C13BA-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BA-00 CONTROL MODULE POWER SUPPLY

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286811

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BA-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. • Battery power supply ≤ 4 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13BA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-220, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286812

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	33	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

C13BA-00 CONTROL MODULE POWER SUPPLY

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

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

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 60A fusible link (#G).
3. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13. "Wiring Diagram - BATTERY POWER SUPPLY -"](#).
NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000011286813

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BA-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. • Battery power supply ≤ 4 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).


DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 With CONSULT

C13BA-00 CONTROL MODULE POWER SUPPLY

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13BA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-222, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286814

1.CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.

2. Disconnect steering angle main control module harness connector.

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

YES >> GO TO 2.

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

2.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.

2. Check the voltage between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.

2. Check the 100A fusible link (#J).

3. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2

DAST 2 : DTC Description

INFOID:000000011286815

DTC DETECTION LOGIC

C13BA-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BA-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. • Battery power supply ≤ 4 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13BA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-223, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286816

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

C13BA-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 100A fusible link (#H).
3. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

C13BB-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BB-00 CONTROL MODULE POWER SUPPLY

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286817

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BB-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. • 20 V ≤ Battery power supply

POSSIBLE CAUSE

- Battery
- Power supply circuit
- Alternator
- Steering force control module

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13BB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-225, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286818

1. CHECK STEERING FORCE CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "CONT MODULE INSIDE VOLT" and "BATTERY VOLTAGE".
3. Check the value

Monitor item	Standard value (Approx.)
CONT MODULE INSIDE VOLT	Battery voltage – 0.6 V
BATTERY VOLTAGE	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between control module harness connector and ground.

C13BB-00 CONTROL MODULE POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		—	Continuity
Connector	Terminal		
M72	33	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 60A fusible link (#G).
3. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

5.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000011286819

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BB-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. <ul style="list-style-type: none">• 20 V ≤ Battery power supply

POSSIBLE CAUSE

- Battery
- Power supply circuit
- Alternator
- Steering angle main control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

C13BB-00 CONTROL MODULE POWER SUPPLY

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13BB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-227, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286820

1. CHECK STEERING ANGLE MAIN CONTROL MODULE SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "CONT MODULE INSIDE VOLT" and "BATTERY VOLTAGE".
3. Check the value

Monitor item	Standard value (Approx.)
CONT MODULE INSIDE VOLT	Battery voltage – 0.6 V
BATTERY VOLTAGE	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

YES >> GO TO 3.

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

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.

C13BB-00 CONTROL MODULE POWER SUPPLY

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Check the 100A fusible link (#J).
3. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

5.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2

DAST 2 : DTC Description

INFOID:000000011286821

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BB-00	CONTROL MODULE POWER SUPPLY (Control module power supply)	Control module power supply is following condition. <ul style="list-style-type: none">• 20 V ≤ Battery power supply

POSSIBLE CAUSE

- Battery
- Power supply circuit
- Alternator
- Steering angle sub control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

 **With CONSULT**

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13BB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-228, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286822

1.CHECK STEERING ANGLE SUB CONTROL MODULE SIGNAL

 **With CONSULT**

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "CONT MODULE INSIDE VOLT" and "BATTERY VOLTAGE".
3. Check the value

C13BB-00 CONTROL MODULE POWER SUPPLY

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Monitor item	Standard value (Approx.)
CONT MODULE INSIDE VOLT	Battery voltage – 0.6 V
BATTERY VOLTAGE	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2.CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 100A fusible link (#H).
3. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

5.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

C13BC-00 CONTROL MODULE IGN POWER SUP

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BC-00 CONTROL MODULE IGN POWER SUP

DTC Description

INFOID:000000011286823

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BC-00	CONTROL MODULE IGN POWER SUP (Control module ignition power supply)	The malfunction in control module ignition power supply circuit is detected

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fuse
- Ignition power supply circuit (open or short)
- Steering force control module
- Steering angle main control module
- Steering angle sub control module

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3", "DAST 1" or "DAST 2".

Is DTC "C13BC-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-230, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000011286824

1. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.
5. Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

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

C13BC-00 CONTROL MODULE IGN POWER SUP

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2. CHECK INTERMITTENT INCIDENT FOR STEERING ANGLE MAIN CONTROL MODULE

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

3. CHECK IGNITION POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

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

4. CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle sub control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

5. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

1. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

2. Turn the ignition switch ON.
3. Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> GO TO 6.
NO >> GO TO 7.

6. CHECK INTERMITTENT INCIDENT FOR STEERING ANGLE SUB CONTROL MODULE

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

7. CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.

C13BC-00 CONTROL MODULE IGN POWER SUP

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

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

8. CHECK INTERNAL CIRCUIT IN STEERING FORCE CONTROL MODULE

Check the continuity between steering force control module connector terminals.

Steering force control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

- YES >> GO TO 9.
NO >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

9. CHECK IGNITION POWER SUPPLY FOR STEERING FORCE CONTROL MODULE

1. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	0 V

2. Turn the ignition switch ON.
3. Check the voltage between force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

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

10. CHECK INTERMITTENT INCIDENT FOR STEERING FORCE CONTROL MODULE

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

11. CHECK IGNITION POWER SUPPLY CIRCUIT (3)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#12).
3. Check the harness for open or short between steering force control module harness connector No.25 terminal and the 10A fuse (#12).

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-57, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).
NO >> Repair or replace error-detected parts.

C13BD-00 CONTROL MODULE IGN POWER SUP

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BD-00 CONTROL MODULE IGN POWER SUP

DAST 1

DAST 1 : DTC Description

INFOID:000000011286825

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BD-00	CONTROL MODULE IGN POWER SUP (Control module ignition power supply)	The malfunction in CAN wake up circuit is detected

POSSIBLE CAUSE

- Harness and connector
- CAN wake up circuit (open or short)
- Steering force control module
- Steering angle main control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3", "DAST 1" or "DAST 2".

Is DTC "C13BD-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-233. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286826

1. CHECK CAN WAKE UP CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector and steering angle main control module harness connector.
3. Check the continuity between steering force control module harness connector and steering angle main control module harness connector.

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	23	E26	23	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK STEERING ANGLE MAIN CONTROL MODULE SIGNAL

C13BD-00 CONTROL MODULE IGN POWER SUP

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

④ With CONSULT

1. Connect steering force control module harness connector and steering angle main control module harness connector.
2. Turn the ignition switch ON.
3. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "SUB IGN VOLTAGE".
4. Check the value

Monitor item	Standard value (Approx.)
SUB IGN VOLTAGE	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

3. PERFORM SELF-DIAGNOSIS FOR STEERING ANGLE MAIN CONTROL MODULE

④ With CONSULT

1. Turn the ignition switch OFF.
2. Connect steering angle main control module harness connector.
3. Turn the ignition switch ON.
4. Erase self-diagnosis for "DAST 1".
5. Turn the ignition switch OFF and wait for at least 10 seconds.
6. Start the engine.

CAUTION:

Never drive the vehicle.

7. Perform self-diagnosis for "DAST 1".

Is DTC "C13BD-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13BE-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BE-00 FLEXRAY COMMUNICATION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286827

NOTE:

During engine start, the DTC "C13BE-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BE-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected when the system is starting.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

④ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13BE-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13BE-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

④ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1" and "DAST 2".
3. Check the each system self-diagnostic result.

C13BE-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Detected DTC or system condition			Possible cause	Malfunction pattern
DAST 1	DAST 2	EPS/DAST 3		
System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C2-00	C13BE-00, C13C0-00 or C13C2-00	<ul style="list-style-type: none"> FlexRay communication circuit Steering angle main control module 	Pattern 1
C13C0-00, C13C2-00 or System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C3-00	<ul style="list-style-type: none"> FlexRay communication circuit Steering angle sub control module 	Pattern 2
System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C1-00 or C13C4-00	<ul style="list-style-type: none"> FlexRay communication circuit Steering force control module 	Pattern 3

What is the malfunction pattern?

- Pattern 1>>Proceed to diagnosis procedure. Refer to [STC-236, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 1\)"](#).
- Pattern 2>>Proceed to diagnosis procedure. Refer to [STC-236, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 2\)"](#).
- Pattern 3>>Proceed to diagnosis procedure. Refer to [STC-237, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 3\)"](#).

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000011286828

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

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

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

INFOID:000000011286829

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

C13BE-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Diagnosis Procedure (Pattern 3)

INFOID:0000000011286830

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286831

NOTE:

During engine start, the DTC "C13BE-00" may be detected due to temporary low voltage.

C13BE-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BE-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected when the system is starting.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering angle main control module

NOTE:

- When “C13BE-00” is detected as “PRCNT”, “DAST 1” is not displayed on CONSULT. For diagnosis, refer to [STC-410, "Description"](#).
- When “C13BE-00” is detected as “PAST”, Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286832

NOTE:

During engine start, the DTC “C13BE-00” may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BE-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected when the system is starting.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for “DAST 2”.

Is DTC “C13BE-00” detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-239, "DAST 2 : Diagnosis Procedure"](#).
- NO >> GO TO 3.

C13BE-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

3.CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).
2. Perform self-diagnosis for "DAST 2".

Is DTC "C13BE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-239. "DAST 2 : Diagnosis Procedure"](#).
NO >> INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286833

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

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

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-419. "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

C13BF-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13BF-00 FLEXRAY COMMUNICATION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286834

NOTE:

During engine start, the DTC "C13BF-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BF-00	FLEXRAY COMMUNICATION (FlexRay communication)	<ul style="list-style-type: none">The malfunction in FlexRay communication between control modules is detected.The malfunction status of other control module is detected.

POSSIBLE CAUSE

- Steering force control module
- Steering angle main control module
- Steering angle sub control module
- Ignition power supply circuit

FAIL-SAFE

- Variable

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13BF-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

- Check intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13BF-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1" and "DAST 2".
- Check the each system self-diagnostic result.

C13BF-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPIVE STEERING]

Detected DTC or system condition			Possible cause	Malfunction pattern
DAST 1	DAST 2	EPS/DAST 3		
C13C2-00 and C13C3-00	C13BF-00	C13BF-00	<ul style="list-style-type: none"> Ignition power supply circuit (between steering angle main control module and steering angle sub control module) Steering angle main control module Steering angle sub control module 	Pattern 1
C13C3-00	C13C3-00	C13BF-00	<ul style="list-style-type: none"> Ignition power supply circuit (between steering force control module and steering angle sub control module) Steering force control module Steering angle sub control module 	Pattern 2

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to [STC-241, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 1\)"](#).

Pattern 2>>Proceed to diagnosis procedure. Refer to [STC-242, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 2\)"](#).

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:0000000011286835

1.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

- Turn the ignition switch OFF.
- Disconnect steering angle main control module harness connector.
- Check the voltage between steering angle main control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

- Turn the ignition switch ON.
- Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module and steering angle sub control module. Refer to [STC-419, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

3.CHECK IGNITION POWER SUPPLY CIRCUIT

- Turn the ignition switch OFF.
- Disconnect steering angle sub control module harness connector.
- Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

C13BF-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to [STC-397, "Diagnosis Procedure"](#).
NO >> Repair or replace error-detected parts.

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

INFOID:000000011286836

1.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle sub control module		Continuity
Connector	Terminal	
E29	25	Existed

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

2.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

1. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		Continuity
Connector	Terminal	
E29	25	0 V

2. Turn the ignition switch ON.

3. Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		Continuity
Connector	Terminal	
E29	25	10.5 – 16.0 V

Is the inspection result normal?

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

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module and steering angle sub control module. Refer to [STC-418, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

4.CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.

2. Disconnect steering force control module harness connector.

3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

- YES >> Check the ignition power supply circuit for steering force control module. Refer to [STC-397, "Diagnosis Procedure"](#).
NO >> Repair or replace error-detected parts.

DAST 1

C13BF-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

DAST 1 : DTC Description

INFOID:000000011286837

NOTE:

During engine start, the DTC "C13BF-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BF-00	FLEXRAY COMMUNICATION (FlexRay communication)	<ul style="list-style-type: none">The malfunction in FlexRay communication between control modules is detected.The malfunction status of other control module is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module
- Ignition power supply circuit

NOTE:

- When "C13BF-00" is detected as "PRSNT", "DAST 1" is not displayed on CONSULT. For diagnosis, refer to [STC-410, "Description"](#).
- When "C13BF-00" is detected as "PAST", Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

FAIL-SAFE

- Variable

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286838

NOTE:

During engine start, the DTC "C13BF-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13BF-00	FLEXRAY COMMUNICATION (FlexRay communication)	<ul style="list-style-type: none">The malfunction in FlexRay communication between control modules is detected.The malfunction status of other control module is detected.

POSSIBLE CAUSE

- Steering angle main control module
- Steering angle sub control module
- Ignition power supply circuit

FAIL-SAFE

- Variable

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

C13BF-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13BF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-244, "DAST 2 : Diagnosis Procedure"](#).

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13BF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-244, "DAST 2 : Diagnosis Procedure"](#).

NO >> INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:0000000011286839

1. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.

5. Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module and steering angle sub control module. Refer to [STC-419, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

3. CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

C13BF-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to [STC-397, "Diagnosis Procedure"](#).
- NO >> Repair or replace error-detected parts.

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C13C0-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13C0-00 FLEXRAY COMMUNICATION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286840

NOTE:

During engine start, the DTC "C13C0-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C0-00	FLEXRAY COMMUNICATION (FlexRay communication)	<ul style="list-style-type: none">The malfunction in FlexRay communication between control modules is detected.The malfunction status of other control module is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module
- Battery power supply circuit
- Ignition power supply circuit
- Harness connector

FAIL-SAFE

- Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C0-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

- Check intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

- Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C0-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

Ⓟ With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

C13C0-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Perform self-diagnosis for "DAST 1" and "DAST 2".
3. Check the each system self-diagnostic result.

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C2-00	C13BE-00, C13C0-00 or C13C2-00	<ul style="list-style-type: none"> • FlexRay communication circuit • Steering angle main control module 	Pattern 1
C13C0-00, C13C2-00 or System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C3-00	<ul style="list-style-type: none"> • FlexRay communication circuit • Steering angle sub control module 	Pattern 2
System is not displayed on CONSULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	<ul style="list-style-type: none"> • Battery power supply circuit for steering angle main control module • Steering angle main control module harness connector • Ignition power supply circuit (between steering angle main control module and steering angle sub control module) 	Pattern 3
System is not displayed on CONSULT	System is not displayed on CONSULT	C13C0-00, C13C2-00 and C13C3-00	<ul style="list-style-type: none"> • Ignition power supply circuit (between steering force control module and steering angle sub control module) • Steering force control module • Steering angle sub control module 	Pattern 4
C13C0-00 and C13C2-00	System is not displayed on CONSULT	C13C0-00 and C13C3-00	<ul style="list-style-type: none"> • Battery power supply circuit for steering angle sub control module 	Pattern 5

What is the malfunction pattern?

- Pattern 1>>Proceed to diagnosis procedure. Refer to [STC-247. "EPS/DAST 3 : Diagnosis Procedure \(Pattern 1\)".](#)
- Pattern 2>>Proceed to diagnosis procedure. Refer to [STC-248. "EPS/DAST 3 : Diagnosis Procedure \(Pattern 2\)".](#)
- Pattern 3>>Proceed to diagnosis procedure. Refer to [STC-248. "EPS/DAST 3 : Diagnosis Procedure \(Pattern 3\)".](#)
- Pattern 4>>Proceed to diagnosis procedure. Refer to [STC-249. "EPS/DAST 3 : Diagnosis Procedure \(Pattern 4\)".](#)
- Pattern 5>>Proceed to diagnosis procedure. Refer to [STC-250. "EPS/DAST 3 : Diagnosis Procedure \(Pattern 5\)".](#)

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000011286841

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

C13C0-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

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

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

INFOID:0000000011286842

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle sub control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	19	Ground	Not existed
	20		

Is the inspection result normal?

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

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

EPS/DAST 3 : Diagnosis Procedure (Pattern 3)

INFOID:0000000011286843

1.CHECK STEERING ANGLE MAIN CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2.CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

C13C0-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.
5. Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

NO >> GO TO 5.

5.CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to [STC-397, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

EPS/DAST 3 : Diagnosis Procedure (Pattern 4)

INFOID:000000011286844

1.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

C13C0-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

2.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

1. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

2. Turn the ignition switch ON.

3. Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module and steering angle sub control module. Refer to [STC-418, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

4.CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module. Refer to [STC-397, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

EPS/DAST 3 : Diagnosis Procedure (Pattern 5)

INFOID:000000011286845

1.CHECK STEERING ANGLE SUB CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

C13C0-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

YES >> GO TO 2.

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

2.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

NO >> GO TO 3.

3.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#H).
2. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13. "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286846

NOTE:

During engine start, the DTC "C13C0-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C0-00	FLEXRAY COMMUNICATION (FlexRay communication)	<ul style="list-style-type: none"> • The malfunction in FlexRay communication between control modules is detected. • The malfunction status of other control module is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering angle sub control module
- Battery power supply circuit

FAIL-SAFE

- Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

C13C0-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13C0-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13C0-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2" and "EPS/DAST 3".

3. Check the each system self-diagnostic result.

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
C13C0-00, C13C2-00 or System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C3-00	<ul style="list-style-type: none">• FlexRay communication circuit• Steering angle sub control module	Pattern 1
C13C0-00 and C13C2-00	System is not displayed on CONSULT	C13C0-00 and C13C3-00	<ul style="list-style-type: none">• Battery power supply circuit for steering angle sub control module	Pattern 2

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to [STC-252. "DAST 1 : Diagnosis Procedure \(Pattern 1\)"](#).

Pattern 2>>Proceed to diagnosis procedure. Refer to [STC-253. "DAST 1 : Diagnosis Procedure \(Pattern 2\)"](#).

DAST 1 : Diagnosis Procedure (Pattern 1)

INFOID:000000011286847

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle sub control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

C13C0-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	19	Ground	Not existed
	20		

A
B

Is the inspection result normal?

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

C

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

D

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

E

DAST 1 : Diagnosis Procedure (Pattern 2)

INFOID:000000011286848

1.CHECK STEERING ANGLE SUB CONTROL MODULE GROUND CIRCUIT

F

- Turn the ignition switch OFF.
- Disconnect steering angle sub control module harness connector.
- Check the continuity between control module harness connector and ground.

STC

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

H
I

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

J

2.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (1)

- Turn the ignition switch OFF.
- Disconnect steering angle sub control module harness connector.
- Check the voltage between steering angle sub control module harness connector and ground.

K
L

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

M

Is the inspection result normal?

- YES >> Perform intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).
NO >> GO TO 3.

N

3.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (2)

- Check the 100A fusible link (#H).
- Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

O
P

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).
NO >> Repair or replace error-detected parts.

DAST 2

DAST 2 : DTC Description

INFOID:000000011286849

NOTE:

C13C0-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

During engine start, the DTC "C13C0-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C0-00	FLEXRAY COMMUNICATION (FlexRay communication)	<ul style="list-style-type: none">The malfunction in FlexRay communication between control modules is detected.The malfunction status of other control module is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering angle main control module
- Battery power supply circuit
- Ignition power supply circuit
- Harness connector

FAIL-SAFE

- Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 2".

Is DTC "C13C0-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

- Check intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

- Perform self-diagnosis for "DAST 2".

Is DTC "C13C0-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1" and "EPS/DAST 3".
- Check the each system self-diagnostic result.

C13C0-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPIVE STEERING]

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C2-00	C13BE-00, C13C0-00 or C13C2-00	<ul style="list-style-type: none"> FlexRay communication circuit Steering angle main control module 	Pattern 1
System is not displayed on CONSULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	<ul style="list-style-type: none"> Battery power supply circuit for steering angle main control module Steering angle main control module harness connector Ignition power supply circuit (between steering angle main control module and steering angle sub control module) 	Pattern 2

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to [STC-255, "DAST 2 : Diagnosis Procedure \(Pattern 1\)"](#).
 Pattern 2>>Proceed to diagnosis procedure. Refer to [STC-255, "DAST 2 : Diagnosis Procedure \(Pattern 2\)"](#).

DAST 2 : Diagnosis Procedure (Pattern 1)

INFOID:000000011286850

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

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

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

DAST 2 : Diagnosis Procedure (Pattern 2)

INFOID:000000011286851

1.CHECK STEERING ANGLE MAIN CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

C13C0-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 2.

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

2.CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13. "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.
5. Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

NO >> GO TO 5.

5.CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to [STC-397. "Diagnosis Procedure"](#).

C13C0-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

NO >> Repair or replace error-detected parts.

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C13C1-00 FLEXRAY COMMUNICATION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286852

NOTE:

During engine start, the DTC “C13C1-00” may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C1-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module

FAIL-SAFE

- Mode 1, Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for “EPS/DAST 3”.

Is DTC “C13C1-00” detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).
2. Perform self-diagnosis for “EPS/DAST 3”.

Is DTC “C13C1-00” detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for “DAST 1” and “DAST 2”.
3. Check the each system self-diagnostic result.

C13C1-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
System is not displayed on CONSULT	System is not displayed on CONSULT	C13C1-00 and C13C4-00	<ul style="list-style-type: none"> FlexRay communication circuit Steering force control module Steering angle main control module Steering angle sub control module 	Pattern 1
System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C1-00 or C13C4-00	<ul style="list-style-type: none"> FlexRay communication circuit Steering force control module 	Pattern 2

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to [STC-259, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 1\)"](#).

Pattern 2>>Proceed to diagnosis procedure. Refer to [STC-259, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 2\)"](#).

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000011286853

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module, steering angle sub control module and steering force control module. Refer to [STC-419, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#) and [STC-418, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

INFOID:000000011286854

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

C13C1-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000011286855

NOTE:

During engine start, the DTC "C13C1-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C1-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering angle main control module

NOTE:

• When "C13C1-00" is detected as "PRCNT", "DAST 1" is not displayed on CONSULT. For diagnosis, refer to [STC-410, "Description"](#).

• When "C13C1-00" is detected as "PAST", Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286856

NOTE:

During engine start, the DTC "C13C1-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

C13C1-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C1-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering angle sub control module

NOTE:

- When “C13C1-00” is detected as “PRSNT”, “DAST 2” is not displayed on CONSULT. For diagnosis, refer to [STC-410, "Description"](#).
- When “C13C1-00” is detected as “PAST”, Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

FAIL-SAFE

- Mode1, Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

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STC

C13C2-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13C2-00 FLEXRAY COMMUNICATION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286857

NOTE:

During engine start, the DTC "C13C2-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C2-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module
- Battery power supply circuit
- Ignition power supply circuit
- Harness connector

FAIL-SAFE

- Mode 1, Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C2-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C2-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1" and "DAST 2".

C13C2-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

3. Check the each system self-diagnostic result.

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C2-00	C13BE-00, C13C0-00 or C13C2-00	<ul style="list-style-type: none"> FlexRay communication circuit Steering angle main control module 	Pattern 1
System is not displayed on CONSULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	<ul style="list-style-type: none"> Battery power supply circuit for steering angle main control module Steering angle main control module harness connector Ignition power supply circuit (between steering angle main control module and steering angle sub control module) 	Pattern 2
System is not displayed on CONSULT	System is not displayed on CONSULT	C13C0-00, C13C2-00 and C13C3-00	<ul style="list-style-type: none"> Ignition power supply circuit (between steering force control module and steering angle sub control module) Steering force control module Steering angle sub control module 	Pattern 3

What is the malfunction pattern?

Pattern 1 >> Proceed to diagnosis procedure. Refer to [STC-263, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 1\)"](#).

Pattern 2 >> Proceed to diagnosis procedure. Refer to [STC-264, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 2\)"](#).

Pattern 3 >> Proceed to diagnosis procedure. Refer to [STC-265, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 3\)"](#).

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000011286858

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

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

2. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

C13C2-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

INFOID:000000011286859

1. CHECK STEERING ANGLE MAIN CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.
5. Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

NO >> GO TO 5.

C13C2-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

5. CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to [STC-397, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

EPS/DAST 3 : Diagnosis Procedure (Pattern 3)

INFOID:0000000011286860

1. CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle sub control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

2. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

1. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

2. Turn the ignition switch ON.
3. Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module and steering angle sub control module. Refer to [STC-418, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

4. CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

C13C2-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module. Refer to [STC-397, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

DAST 1

DAST 1 : DTC Description

INFOID:000000011286861

NOTE:

During engine start, the DTC "C13C2-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C2-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering angle main control module
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13C2-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13C2-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

With CONSULT

C13C2-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "DAST 2" and "EPS/DAST 3".
3. Check the each system self-diagnostic result.

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
C13C0-00, C13C2-00 or System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C3-00	<ul style="list-style-type: none"> • FlexRay communication circuit • Steering angle sub control module 	Pattern 1
C13C0-00 and C13C2-00	System is not displayed on CONSULT	C13C0-00 and C13C3-00	<ul style="list-style-type: none"> • Battery power supply circuit for steering angle sub control module 	Pattern 2
C13C2-00 and C13C3-00	C13BF-00	C13BF-00	<ul style="list-style-type: none"> • Ignition power supply circuit (between steering angle main control module and steering angle sub control module) • Steering angle main control module • Steering angle sub control module 	Pattern 3

What is the malfunction pattern?

- Pattern 1>>Proceed to diagnosis procedure. Refer to [STC-267, "DAST 1 : Diagnosis Procedure \(Pattern 1\)"](#).
 Pattern 2>>Proceed to diagnosis procedure. Refer to [STC-267, "DAST 1 : Diagnosis Procedure \(Pattern 2\)"](#).
 Pattern 3>>Proceed to diagnosis procedure. Refer to [STC-268, "DAST 1 : Diagnosis Procedure \(Pattern 3\)"](#).

DAST 1 : Diagnosis Procedure (Pattern 1)

INFOID:0000000011286862

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle sub control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	19	Ground	Not existed
	20		

Is the inspection result normal?

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

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

DAST 1 : Diagnosis Procedure (Pattern 2)

INFOID:0000000011286863

1.CHECK STEERING ANGLE SUB CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.

C13C2-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

YES >> GO TO 2.

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

2.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

NO >> GO TO 3.

3.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#H).
2. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

DAST 1 : Diagnosis Procedure (Pattern 3)

INFOID:0000000011286864

1.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.
5. Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

C13C2-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> Replace steering angle main control module and steering angle sub control module. Refer to [STC-419. "Removal and Installation"](#), [STC-420. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

3. CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to [STC-397. "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

DAST 2

DAST 2 : DTC Description

INFOID:000000011286865

STC

NOTE:

During engine start, the DTC "C13C2-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C2-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering angle main control module
- Battery power supply circuit
- Ignition power supply circuit
- Harness connector

FAIL-SAFE

- Mode 1, Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13C2-00" detected?

C13C2-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

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

3.CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).
2. Perform self-diagnosis for "DAST 2".

Is DTC "C13C2-00" detected?

- YES >> GO TO 4.
NO >> INSPECTION END

4.CHECK MALFUNCTION PATTERN

ⓑ With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "DAST 1" and "EPS/DAST 3".
3. Check the each system self-diagnostic result.

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C2-00	C13BE-00, C13C0-00 or C13C2-00	<ul style="list-style-type: none"> • FlexRay communication circuit • Steering angle main control module 	Pattern 1
System is not displayed on CONSULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	<ul style="list-style-type: none"> • Battery power supply circuit for steering angle main control module • Steering angle main control module harness connector • Ignition power supply circuit (between steering angle main control module and steering angle sub control module) 	Pattern 2

What is the malfunction pattern?

- Pattern 1>>Proceed to diagnosis procedure. Refer to [STC-270. "DAST 2 : Diagnosis Procedure \(Pattern 1\)"](#).
Pattern 2>>Proceed to diagnosis procedure. Refer to [STC-271. "DAST 2 : Diagnosis Procedure \(Pattern 2\)"](#).

DAST 2 : Diagnosis Procedure (Pattern 1)

INFOID:000000011286866

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

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

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

C13C2-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

DAST 2 : Diagnosis Procedure (Pattern 2)

INFOID:000000011286867

1.CHECK STEERING ANGLE MAIN CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2.CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

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

3.CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).
- NO >> Repair or replace error-detected parts.

4.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.
5. Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

C13C2-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

NO >> GO TO 5.

5.CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to [STC-397, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

C13C3-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13C3-00 FLEXRAY COMMUNICATION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286868

NOTE:

During engine start, the DTC "C13C3-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C3-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle sub control module
- Battery power supply circuit

FAIL-SAFE

- Mode 1, Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C3-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C3-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1" and "DAST 2".
3. Check the each system self-diagnostic result.

C13C3-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
C13C0-00, C13C2-00 or System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C3-00	<ul style="list-style-type: none"> FlexRay communication circuit Steering angle sub control module 	Pattern 1
System is not displayed on CONSULT	System is not displayed on CONSULT	C13C0-00, C13C2-00 and C13C3-00	<ul style="list-style-type: none"> Ignition power supply circuit (between steering force control module and steering angle sub control module) Steering force control module Steering angle sub control module 	Pattern 2
C13C0-00 and C13C2-00	System is not displayed on CONSULT	C13C0-00 and C13C3-00	<ul style="list-style-type: none"> Battery power supply circuit for steering angle sub control module 	Pattern 3

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to [STC-274, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 1\)"](#).

Pattern 2>>Proceed to diagnosis procedure. Refer to [STC-274, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 2\)"](#).

Pattern 3>>Proceed to diagnosis procedure. Refer to [STC-275, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 3\)"](#).

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000011286869

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle sub control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

INFOID:000000011286870

1.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

C13C3-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

2.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

1. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

2. Turn the ignition switch ON.

3. Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module and steering angle sub control module. Refer to [STC-418, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

4.CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module. Refer to [STC-397, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

EPS/DAST 3 : Diagnosis Procedure (Pattern 3)

INFOID:000000011286871

1.CHECK STEERING ANGLE SUB CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

C13C3-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

YES >> GO TO 2.

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

2.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

NO >> GO TO 3.

3.CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#H).
2. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13. "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

DAST 1

DAST 1 : DTC Description

INFOID:000000011286872

NOTE:

During engine start, the DTC "C13C3-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C3-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- Steering force control module
- Steering angle main control module
- Steering angle sub control module
- Ignition power supply circuit

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

C13C3-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13C3-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13C3-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2" and "EPS/DAST 3".

3. Check the each system self-diagnostic result.

Detected DTC or system condition			Possible cause	Malfunction pattern
DAST 1	DAST 2	EPS/DAST 3		
C13C2-00 and C13C3-00	C13BF-00	C13BF-00	<ul style="list-style-type: none"> • Ignition power supply circuit (between steering angle main control module and steering angle sub control module) • Steering angle main control module • Steering angle sub control module 	Pattern 1
C13C3-00	C13C3-00	C13BF-00	<ul style="list-style-type: none"> • Ignition power supply circuit (between steering force control module and steering angle sub control module) • Steering force control module • Steering angle sub control module 	Pattern 2

What is the malfunction pattern?

Pattern 1 >> Proceed to diagnosis procedure. Refer to [STC-277. "DAST 1 : Diagnosis Procedure \(Pattern 1\)"](#).

Pattern 2 >> Proceed to diagnosis procedure. Refer to [STC-278. "DAST 1 : Diagnosis Procedure \(Pattern 2\)"](#).

DAST 1 : Diagnosis Procedure (Pattern 1)

INFOID:0000000011286873

1. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.

C13C3-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

5. Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module and steering angle sub control module. Refer to [STC-419, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

3.CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to [STC-397, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

DAST 1 : Diagnosis Procedure (Pattern 2)

INFOID:0000000011286874

1.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle sub control module		—	Continuity
Terminal			
25	27		Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

2.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

1. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

2. Turn the ignition switch ON.

3. Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

C13C3-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

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

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module and steering angle sub control module. Refer to [STC-418. "Removal and Installation"](#), [STC-420. "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

4.CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

- YES >> Check the ignition power supply circuit for steering force control module. Refer to [STC-397. "Diagnosis Procedure"](#).
- NO >> Repair or replace error-detected parts.

DAST 2

DAST 2 : DTC Description

INFOID:000000011286875

NOTE:

During engine start, the DTC "C13C3-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C3-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle sub control module

FAIL-SAFE

- Mode 1, Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

1. Start the engine.

C13C3-00 FLEXRAY COMMUNICATION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13C3-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-280, "DAST 2 : Diagnosis Procedure"](#).
NO >> GO TO 3.

3.CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).
2. Perform self-diagnosis for "DAST 2".

Is DTC "C13C3-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-280, "DAST 2 : Diagnosis Procedure"](#).
NO >> INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286876

1.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle sub control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

2.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

1. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

2. Turn the ignition switch ON.
3. Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

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

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module and steering angle sub control module. Refer to [STC-418, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

4.CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

C13C3-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module. Refer to [STC-397, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

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C13C4-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13C4-00 FLEXRAY COMMUNICATION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286877

NOTE:

During engine start, the DTC "C13C4-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C4-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction of synchronization in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C4-00" detected?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

1. Check intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C4-00" detected?

YES >> GO TO 4.

NO >> INSPECTION END

4. CHECK MALFUNCTION PATTERN

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1" and "DAST 2".
3. Check the each system self-diagnostic result.

C13C4-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
System is not displayed on CONSULT	System is not displayed on CONSULT	C13C1-00 and C13C4-00	<ul style="list-style-type: none"> FlexRay communication circuit Steering force control module Steering angle main control module Steering angle sub control module 	Pattern 1
System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C1-00 or C13C4-00	<ul style="list-style-type: none"> FlexRay communication circuit Steering force control module 	Pattern 2

What is the malfunction pattern?

Pattern 1>>Proceed to diagnosis procedure. Refer to [STC-283, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 1\)"](#).

Pattern 2>>Proceed to diagnosis procedure. Refer to [STC-283, "EPS/DAST 3 : Diagnosis Procedure \(Pattern 2\)"](#).

EPS/DAST 3 : Diagnosis Procedure (Pattern 1)

INFOID:000000011286878

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module, steering angle sub control module and steering force control module. Refer to [STC-419, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#) and [STC-418, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Diagnosis Procedure (Pattern 2)

INFOID:000000011286879

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

C13C4-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000011286880

NOTE:

During engine start, the DTC "C13C4-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C4-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction of synchronization in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module

NOTE:

• When "C13C4-00" is detected as "PRSENT", "DAST 1" is not displayed on CONSULT. For diagnosis, refer to [STC-410, "Description"](#).

• When "C13C4-00" is detected as "PAST", Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286881

NOTE:

During engine start, the DTC "C13C4-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

C13C4-00 FLEXRAY COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C4-00	FLEXRAY COMMUNICATION (FlexRay communication)	The malfunction of synchronization in FlexRay communication between control modules is detected.

POSSIBLE CAUSE

- FlexRay communication circuit
- Steering force control module
- Steering angle main control module
- Steering angle sub control module

NOTE:

- When "C13C4-00" is detected as "PRSNT", "DAST 1" is not displayed on CONSULT. For diagnosis, refer to [STC-410, "Description"](#).
- When "C13C4-00" is detected as "PAST", Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

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C13C5-00 STEERING ANGLE SENSOR SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13C5-00 STEERING ANGLE SENSOR SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286882

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C5-00	STEERING ANGLE SENSOR SIGNAL (Steering angle sensor signal)	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- Steering angle sensor

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-286, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286883

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

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to [BRC-58, "DTC Index"](#).

NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C5-00" detected?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

C13C5-00 STEERING ANGLE SENSOR SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

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C13C6-00 G SENSOR SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286884

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C6-00	G SENSOR SIGNAL (G sensor signal)	Malfunction is detected in G sensor signal that is output from ABS actuator and electric unit (control unit) for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- ABS actuator and electric unit (control unit)

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C6-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-298, "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286885

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

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-58, "DTC Index"](#).
 NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C6-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

C13C6-00 G SENSOR SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

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C13C7-00 VEHICLE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13C7-00 VEHICLE SPEED SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286886

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C7-00	VEHICL SPEED SIGNAL (Vehicle speed signal)	Malfunction is detected in vehicle speed signal (ABS) that is output from ABS actuator and electric unit (control unit) for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- ABS actuator and electric unit (control unit)

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C7-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-298, "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286887

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

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-58, "DTC Index"](#).
 NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C7-00" detected?

C13C7-00 VEHICLE SPEED SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

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C13C9-00 DRIVE MODE SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286888

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13C9-00	DRIVE MODE SIGNAL (Drive mode signal)	Malfunction is detected in drive mode signal that is output from chassis control module for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- Chassis control module

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C9-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-298, "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286889

1. PERFORM CHASSIS CONTROL MODULE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "CHASSIS CONTROL".

Is any DTC detected?

- YES >> Check the DTC. Refer to [DAS-423, "DTC Index"](#).
 NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C9-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
 NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13CA-00 ENGINE STATUS SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13CA-00 ENGINE STATUS SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286890

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CA-00	ENGINE STATUS SIGNAL (Engine status signal)	Malfunction is detected in engine status signal that is output from ECM for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- ECM

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CA-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-298, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286891

1. PERFORM ECM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [EC-108, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CA-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13CC-00 T/M GEAR POSI SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13CC-00 T/M GEAR POSI SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286892

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CC-00	T/M GEAR POSI SIGNAL (T/M gear position signal)	Malfunction is detected in shift position signal that is output from TCM for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- TCM

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CC-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-298, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286893

1. PERFORM TCM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "TRANSMISSION".

Is any DTC detected?

- YES >> Check the DTC. Refer to [TM-84, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CC-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13CD-00 ENGINE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13CD-00 ENGINE SPEED SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286894

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CD-00	ENGINE SPEED SIGNAL (Drive mode signal)	Malfunction is detected in engine speed signal that is output from ECM for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- ECM

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CD-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-298, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286895

1. PERFORM ECM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ENGINE".

Is any DTC detected?

- YES >> Check the DTC. Refer to [EC-108, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13CD-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13CE-00 SLEEP/WAKE SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286896

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CE-00	SLEEP WAKE UP SIGNAL (Sleep wake up signal)	Malfunction is detected in sleep wake up signal that is output from BCM for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Steering force control module
- BCM

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “EPS/DAST 3”.

Is DTC “C13CE-00” detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-299, "DAST 1 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286897

1. PERFORM BCM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for “BCM”.

Is any DTC detected?

- YES >> Check the DTC. Refer to [BCS-62, "DTC Index"](#).
- NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for “EPS/DAST 3”.
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for “EPS/DAST 3”.

Is DTC “C13CE-00” detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13CF-00 ALC FUNCTION REQUEST SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPIVE STEERING]

C13CF-00 ALC FUNCTION REQUEST SIGNAL

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286898

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13CF-00	ALC FUNCTION REQUEST SIGNAL (Active lane control function request signal)	Malfunction is detected in Active lane control signal A that is output from chassis control module for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (Chassis communication line)
- Steering angle main control module
- Chassis control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13CF-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-298, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000011286899

1.PERFORM CHASSIS CONTROL MODULE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "CHASSIS CONTROL".

Is any DTC detected?

- YES >> Check the DTC. Refer to [DAS-423, "DTC Index"](#).
NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 1".

Is DTC "C13CF-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13D0-00 ALC FUNCTION REQUEST SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D0-00 ALC FUNCTION REQUEST SIGNAL

DAST 1

DAST 1 : DTC Description

INFOID:000000011286900

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D0-00	ALC FUNCTION REQUEST SIGNAL (Active lane control function request signal)	Malfunction is detected in active lane control signal B that is output from chassis control module for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (Chassis communication line)
- Steering angle main control module
- Chassis control module

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13D0-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-298, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286901

1. PERFORM CHASSIS CONTROL MODULE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "CHASSIS CONTROL".

Is any DTC detected?

- YES >> Check the DTC. Refer to [DAS-423, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D0-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13D1-00 STEERING ANGLE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D1-00 STEERING ANGLE SIGNAL

DAST 1

DAST 1 : DTC Description

INFOID:000000011286902

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D1-00	ALC FUNCTION REQUEST SIGNAL (Active lane control function request signal)	Malfunction is detected in steering angle sensor signal (received from steering angle sensor) that is output from chassis control module for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connector (Chassis communication line)
- Steering angle main control module
- Chassis control module
- Steering angle sensor

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13D1-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-299, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-39, "How to Check Terminal"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286903

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

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-58, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM CHASSIS CONTROL MODULE SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "CHASSIS CONTROL".

Is any DTC detected?

- YES >> Check the DTC. Refer to [DAS-423, "DTC Index"](#).
NO >> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.

C13D1-00 STEERING ANGLE SIGNAL

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D1-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-418, "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13D2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D2-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286904

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D2-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-301. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286905

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D2-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286906

DTC DETECTION LOGIC

C13D2-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D2-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13D2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-302, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286907

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D2-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286908

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D2-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

C13D2-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13D2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-303. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286909

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13D2-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13D3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D3-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286910

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-304. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286911

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D3-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286912

DTC DETECTION LOGIC

C13D3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13D3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-305, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286913

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D3-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286914

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D3-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

C13D3-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13D3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-306. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286915

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13D3-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13D4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D4-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286916

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D4-00	CONTROL MODULE (Control module)	The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Force motor angle sensor
- Sensor circuit (between steering force control module and force motor angle sensor) is open or short.
- Steering force control module

FAIL-SAFE

- Mode 1 or Mode 2

NOTE:

For details of fail-safe, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-307, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286917

1. CHECK THE ANGLE SENSOR

Check the force motor angle sensor. Refer to [STC-308, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to [ST-92, "Removal and Installation"](#).

2. CHECK THE SENSOR CIRCUIT

1. Disconnect steering force control module and force motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

C13D4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	10	M73	1	Existed
	11		5	
	6		4	
	5		8	
	4		2	
	2		6	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

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

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000011286918

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

Force motor angle sensor		Continuity
Terminal		
1	5	Existed
4	8	
2	6	

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to [ST-92, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286919

DTC DETECTION LOGIC

C13D4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D4-00	CONTROL MODULE (Control module)	The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Main motor angle sensor
- Sensor circuit (between steering angle main control module and main motor angle sensor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For details of fail-safe, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13D4-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-309. "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286920

1. CHECK THE ANGLE SENSOR

Check the main motor angle sensor. Refer to [STC-310. "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-103. "Removal and Installation"](#).

2. CHECK THE SENSOR CIRCUIT

1. Disconnect steering angle main control module and main motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering angle main control module		Main motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	10	E93	3	Existed
	11		6	
	6		1	
	5		5	
	4		2	
	2		4	

C13D4-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 1 : Component Inspection

INFOID:0000000011286921

1. CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect main motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

Main motor angle sensor		Continuity
Terminal		
3	6	Existed
1	5	
4	2	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

DAST 2

DAST 2 : DTC Description

INFOID:0000000011286922

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D4-00	CONTROL MODULE (Control module)	The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Sub motor angle sensor
- Sensor circuit (between steering angle sub control module and sub motor angle sensor) is open or short.
- Steering sub control module

FAIL-SAFE

- Mode 2

C13D4-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NOTE:

For details of fail-safe, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 **With CONSULT**

1. Start the engine.
- CAUTION:**
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 2".

Is DTC "C13D4-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-311, "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

STC

DAST 2 : Diagnosis Procedure

INFOID:000000011286923

1. CHECK THE ANGLE SENSOR

Check the sub motor angle sensor. Refer to [STC-312, "DAST 2 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Sub motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

2. CHECK THE SENSOR CIRCUIT

1. Disconnect steering angle sub control module and sub motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering angle sub control module		Sub motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
E29	10	E94	3	Existed
	11		6	
	6		1	
	5		5	
	4		2	
	2		4	

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

C13D4-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2 : Component Inspection

INFOID:000000011286924

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect sub motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

Sub motor angle sensor		Continuity
Terminal		
3	6	Existed
1	5	
4	2	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Sub motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

C13D5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D5-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286925

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D5-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-313. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286926

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D5-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

C13D5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000011286927

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D5-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13D5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-314, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286928

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D5-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286929

DTC DETECTION LOGIC

C13D5-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D5-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.
3. Perform self-diagnosis for "DAST 2".

Is DTC "C13D5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-315, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286930

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13D5-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13D6-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286931

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D6-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D6-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-316. "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286932

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D6-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).
 NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286933

DTC DETECTION LOGIC

C13D6-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D6-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13D6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-317, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286934

1. PERFORM SELF-DIAGNOSIS

With CONSULT

- Turn the ignition switch ON.
- Erase self-diagnosis for "DAST 1".
- Turn the ignition switch OFF and wait for at least 10 seconds.
- Start the engine.

CAUTION:

Never drive the vehicle.

- Perform self-diagnosis for "DAST 1".

Is DTC "C13D6-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286935

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D6-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

C13D6-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13D6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-318. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286936

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13D6-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

C13D7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D7-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286937

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-319. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286938

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D7-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286939

DTC DETECTION LOGIC

C13D7-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 1 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13D7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-320, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286940

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D7-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286941

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D7-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

C13D7-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- Steering angle sub control module

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13D7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-321. "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286942

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13D7-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42. "Intermittent Incident"](#).

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C13D8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D8-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286943

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D8-00	CONTROL MODULE (Control module)	The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Force motor angle sensor
- Sensor circuit (between steering force control module and force motor angle sensor) is open or short.
- Steering force control module

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Turn the ignition switch OFF and wait for at least 10 seconds.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13D8-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-322, "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286944

1. CHECK THE ANGLE SENSOR

Check the force motor angle sensor. Refer to [STC-323, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to [ST-92, "Removal and Installation"](#).

2. CHECK THE SENSOR CIRCUIT

1. Disconnect steering force control module and force motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	10	M73	1	Existed
	11		5	
	6		4	
	5		8	
	4		2	
	2		6	

3. Check the continuity between control module harness connector and ground.

C13D8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		—	Continuity
Connector	Terminal		
M71	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

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

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
- NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000011286945

STC

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

Force motor angle sensor		Continuity
Terminal		
1	5	Existed
4	8	
2	6	

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Force motor angle sensor is malfunction. Replace steering column assembly. Refer to [ST-92, "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286946

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D8-00	CONTROL MODULE (Control module)	The malfunction in each motor angle sensor is detected.

POSSIBLE CAUSE

- Main motor angle sensor
- Sensor circuit (between steering angle main control module and main motor angle sensor) is open or short.
- Steering angle main control module

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

C13D8-00 CONTROL MODULE

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

ⓑ With CONSULT

1. Turn the ignition switch OFF and wait for at least 10 seconds.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "DAST 1".

Is DTC "C13D8-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-324, "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286947

1. CHECK THE ANGLE SENSOR

Check the main motor angle sensor. Refer to [STC-325, "DAST 1 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

2. CHECK THE SENSOR CIRCUIT

1. Disconnect steering angle main control module and main motor angle sensor harness connector.
2. Check the continuity between control module harness connector and angle sensor harness connector.

Steering angle main control module		Main motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	10	E93	3	Existed
	11		6	
	6		1	
	5		5	
	4		2	
	2		4	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	10	Ground	Not existed
	11		
	6		
	5		
	4		
	2		

Is the inspection result normal?

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

3. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
 NO >> Repair or replace error-detected part.

C13D8-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : Component Inspection

INFOID:000000011286948

1.CHECK THE ANGLE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect main motor angle sensor harness connector.
3. Check continuity between motor angle sensor connector terminals.

Main motor angle sensor		Continuity
Terminal		
3	6	Existed
1	5	
4	2	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Main motor angle sensor is malfunction. Replace steering gear assembly. Refer to [ST-103](#).
["Removal and Installation"](#).

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C13D9-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13D9-00 CONTROL MODULE

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286949

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D9-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering force control module

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Turn the ignition switch OFF and wait for at least 10 seconds.
Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for “EPS/DAST 3”.

Is DTC “C13D9-00” detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-326, "EPS/DAST 3 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286950

1. PERFORM SELF-DIAGNOSIS

Ⓟ With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for “EPS/DAST 3”.
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for “EPS/DAST 3”.

Is DTC “C13D9-00” detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
 NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286951

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13D9-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

DTC CONFIRMATION PROCEDURE

C13D9-00 CONTROL MODULE

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

1. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch OFF and wait for at least 10 seconds.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. Perform self-diagnosis for "DAST 1".

Is DTC "C13D9-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-327, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286952

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13D9-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

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C13DB-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13DB-00 STEERING TORQUE SENSOR

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286953

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DB-00	STEERING TORQUE SENSOR (Steering torque sensor)	The signal voltage of steering torque sensor is following condition for 1 second or more continuously. <ul style="list-style-type: none">• Main signal voltage < 0.3 V, 4.7 V < Main signal voltage• Sub signal voltage < 0.3 V, 4.7 V < Sub signal voltage

POSSIBLE CAUSE

- Steering torque sensor
- Sensor circuit (between steering angle main control module and steering torque sensor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 3 (When control module detects a malfunction at startup.)
- Mode 2 (When control module detects a malfunction except during startup.)

NOTE:

For details of fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

NOTE:

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13DB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-328. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000011286954

1. CHECK TORQUE SENSOR POWER SUPPLY CIRCUIT

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "TORQUE SEN VOLTAGE".
3. Check the value

Monitor item	Standard value (Approx.)
TORQUE SEN VOLTAGE	4.5 – 5.5 V

Is the inspection result normal?

YES >> GO TO 2.

C13DB-00 STEERING TORQUE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

2.CHECK TORQUE SENSOR GROUND CIRCUIT

1. Disconnect steering angle main control module harness connector.
2. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	32	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK TORQUE SENSOR SIGNAL

 With CONSULT

1. Connect steering angle main control module harness connector.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "TORQUE SEN MAIN 2", and "TORQUE SEN SUB".
4. Check the value

Monitor item	Condition	Standard value (Approx.)
TORQUE SEN MAIN 2	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V
TORQUE SEN SUB	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK TORQUE SENSOR CIRCUIT

1. Disconnect steering angle main control module harness connector.
2. Disconnect steering torque sensor harness connector.
3. Check the continuity between steering angle main control module harness connector and steering torque sensor harness connector.

Steering angle main control module		Steering torque sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	8	E95	2	Existed
	1		4	
	3		3	
	7		1	

4. Check the continuity between control module harness connector and ground.

C13DB-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	8	Ground	Not existed
	1		
	3		
	7		

Is the inspection result normal?

YES >> Torque sensor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

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

5.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

C13DC-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13DC-00 STEERING TORQUE SENSOR

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286955

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DC-00	STEERING TORQUE SENSOR (Steering torque sensor)	The signal voltage of steering torque sensor is following condition for 1 second or more continuously. <ul style="list-style-type: none">• Main signal voltage + Sub signal voltage < 4.75 V• 5.25 V < Main signal voltage + Sub signal voltage

POSSIBLE CAUSE

- Steering torque sensor
- Sensor circuit (between steering angle main control module and steering torque sensor) is open or short.
- Steering angle main control module

FAIL-SAFE

- Mode 3 (When control module detects a malfunction at startup.)
- Mode 2 (When control module detects a malfunction except during startup.)

NOTE:

For details of fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

NOTE:

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13DC-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-331. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000011286956

1. CHECK TORQUE SENSOR POWER SUPPLY CIRCUIT

With CONSULT

1. Turn the ignition switch ON.
2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "TORQUE SEN VOLTAGE".
3. Check the value

Monitor item	Standard value (Approx.)
TORQUE SEN VOLTAGE	4.5 – 5.5 V

Is the inspection result normal?

YES >> GO TO 2.

C13DC-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13. "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

2. CHECK TORQUE SENSOR GROUND CIRCUIT

1. Disconnect steering angle main control module harness connector.
2. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	32	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

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

3. CHECK TORQUE SENSOR SIGNAL

With CONSULT

1. Connect steering angle main control module harness connector.
2. Start the engine.
CAUTION:
Never drive the vehicle.
3. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "TORQUE SEN MAIN 2", and "TORQUE SEN SUB".
4. Check the value

Monitor item	Condition	Standard value (Approx.)
TORQUE SEN MAIN 2	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V
TORQUE SEN SUB	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK TORQUE SENSOR CIRCUIT

1. Disconnect steering angle main control module harness connector.
2. Disconnect steering torque sensor harness connector.
3. Check the continuity between steering angle main control module harness connector and steering torque sensor harness connector.

Steering angle main control module		Steering torque sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	8	E95	2	Existed
	1		4	
	3		3	
	7		1	

4. Check the continuity between steering torque sensor connector terminals.

Steering torque sensor		Continuity
Terminal		
3	4	Not existed

C13DC-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

5. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	8	Ground	Not existed
	1		
	3		
	7		

Is the inspection result normal?

YES >> Torque sensor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#).

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

5.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

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C13DD-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13DD-00 STEERING TORQUE SENSOR

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286957

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DD-00	STEERING TORQUE SENSOR (Steering torque sensor)	The power supply voltage of steering torque sensor is following condition for 1 second or more continuously. <ul style="list-style-type: none">Power supply voltage < 4.5 V, 5.5 V < Power supply voltage

POSSIBLE CAUSE

- Steering torque sensor
- Sensor circuit (between steering angle main control module and steering torque sensor) is open, short or ground short.
- Steering angle main control module

FAIL-SAFE

- Mode 3 (When control module detects a malfunction at startup.)
- Mode 2 (When control module detects a malfunction except during startup.)

NOTE:

For details of fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

- Start the engine.

NOTE:

Never drive the vehicle.

- Turn the steering wheel.
- Perform self-diagnosis for "DAST 1".

Is DTC "C13DD-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-334, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000011286958

1. CHECK TORQUE SENSOR POWER SUPPLY CIRCUIT

Ⓟ With CONSULT

- Turn the ignition switch ON.
- On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "TORQUE SEN VOLTAGE".
- Check the value

Monitor item	Standard value (Approx.)
TORQUE SEN VOLTAGE	4.5 – 5.5 V

Is the inspection result normal?

YES >> GO TO 2.

C13DD-00 STEERING TORQUE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

2.CHECK TORQUE SENSOR GROUND CIRCUIT

1. Disconnect steering angle main control module harness connector.
2. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	32	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

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

3.CHECK TORQUE SENSOR SIGNAL

 With CONSULT

1. Connect steering angle main control module harness connector.
2. Start the engine.

CAUTION:

Never drive the vehicle.

3. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "TORQUE SEN MAIN 2", and "TORQUE SEN SUB".
4. Check the value

Monitor item	Condition	Standard value (Approx.)
TORQUE SEN MAIN 2	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V
TORQUE SEN SUB	Steering wheel: Not steering (There is no steering force)	Approx. 2.5 V
	Steering wheel: Right turn	Approx. 1.4 - 2.5 V
	Steering wheel: Left turn	Approx. 2.5 - 3.6 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK TORQUE SENSOR CIRCUIT

1. Disconnect steering angle main control module harness connector.
2. Check the continuity between steering angle main control module harness connector and steering torque sensor harness connector.

Steering angle main control module		Steering torque sensor		Continuity
Connector	Terminal	Connector	Terminal	
E26	8	E95	2	Existed
	1		4	
	3		3	
	7		1	

3. Check the continuity between control module harness connector and ground.

C13DD-00 STEERING TORQUE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	8	Ground	Not existed
	1		
	3		
	7		

Is the inspection result normal?

YES >> Torque sensor is malfunction. Replace steering gear assembly. Refer to [ST-103, "Removal and Installation"](#)

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

5.CHECK INTERMITTENT INCIDENT

Refer to [GI-45, "Circuit Inspection"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

C13DE-00 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13DE-00 TEMPERATURE SENSOR

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286959

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DE-00	TEMPERATURE SENSOR (Temperature sensor)	Control module detects that the internal temperature in steering force motor is in following state for 1 seconds or more. • Temperature < -50°C (-58°F), 250°C (482°F) < Temperature

POSSIBLE CAUSE

- Force motor temperature sensor (included in force motor angle sensor)
- Sensor circuit (between steering force control module and force motor angle sensor) is open or short.
- Steering force control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection functions, refer to [STC-51, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13DE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-337, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286960

1. CHECK TEMPERATURE SENSOR POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Turn the ignition switch ON.
4. Check the voltage between force motor angle sensor harness connector pin terminals.

Connector	Force motor angle sensor		Voltage (Approx.)
	Terminal		
M73	+	-	5 V
	3	7	

Is the inspection result normal?

YES >> GO TO 6.

C13DE-00 TEMPERATURE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> GO TO 2.

2.CHECK TEMPERATURE SENSOR POWER SUPPLY (2)

Check the voltage between force motor angle sensor harness connector pin terminals.

Force motor angle sensor		—	Voltage (Approx.)
Connector	Terminal		
M73	+	—	5 V
	3	-	
		Ground	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK TEMPERATURE SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering force control module harness connector and force motor angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	29	M73	7	Existed

Is the inspection result normal?

YES >> GO TO 7.

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

4.CHECK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering force control module harness connector and force motor angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	31	M73	3	Existed

4. Check the continuity between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	31	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 5.

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

5.CHECK CONTROL MODULE POWER SUPPLY CIRCUIT

Check the power supply circuit for steering force control module. Refer to [STC-397. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected part.

6.CHECK TEMPERATURE SENSOR

Check the force motor temperature sensor. Refer to [STC-339. "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

C13DE-00 TEMPERATURE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Force motor temperature sensor is malfunction. Replace steering column assembly. Refer to [ST-92. "Removal and Installation"](#).

7.CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000011286961

1.CHECK FORCE MOTOR TEMPERATURE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Check resistance between force motor angle sensor connector pin terminals.

Force motor angle sensor		Condition	Resistance (Approx.)
Terminal			
3	7	0°C	34.8 kΩ
		25°C	10.0 kΩ
		40°C	5.2 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Force motor temperature sensor is malfunction. Replace steering column assembly. Refer to [ST-92. "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011286962

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DE-00	TEMPERATURE SENSOR (Temperature sensor)	Control module detects that the internal temperature in steering force motor is in following state for 1 seconds or more. • Temperature < -40°C (-40°F), 150°C (302°F) < Temperature

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection functions, refer to [STC-51. "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

C13DE-00 TEMPERATURE SENSOR

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "DAST 1".

Is DTC "C13DE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-340, "DAST 1 : Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286963

1. CHECK THE TEMPERATURE OF CONTROL MODULE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "C/M TEMPERATURE".
3. Wait with the ignition switch OFF until the data monitor indication becomes between -40°C (-40°F) and 150°C (302°F).

Does the temperature become between -40°C (-40°F) and 150°C (302°F)?

YES >> GO TO 2.

NO >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13DE-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011286964

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DE-00	TEMPERATURE SENSOR (Temperature sensor)	Control module detects that the internal temperature in steering force motor is in following state for 1 seconds or more. • Temperature < -40°C (-40°F), 150°C (302°F) < Temperature

POSSIBLE CAUSE

- Steering angle sub control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection functions, refer to [STC-51, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

C13DE-00 TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "DAST 2".

Is DTC "C13DE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-341, "DAST 2 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:0000000011286965

1. CHECK THE TEMPERATURE OF CONTROL MODULE

Ⓜ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "C/M TEMPERATURE".
3. Wait with the ignition switch OFF until the data monitor indication becomes between -40°C (-40°F) and 150°C (302°F).

Does the temperature become between -40°C (-40°C) and 150°C (302°F)?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

2. PERFORM SELF-DIAGNOSIS

Ⓜ With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13DE-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

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C13DF-00 CONTROL MODULE

DAST 1

DAST 1 : DTC Description

INFOID:000000011286966

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13DF-00	CONTROL MODULE (Control module)	The internal malfunction in control module is detected.

POSSIBLE CAUSE

- Steering angle main control module

FAIL-SAFE

- Mode 3 (When control module detects a malfunction at startup.)
- Mode 2 (When control module detects a malfunction except during startup.)

NOTE:

For details of fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

NOTE:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13DF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-342, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011286967

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

NOTE:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13DF-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13E0-00 ST CLUTCH COMMAND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E0-00 ST CLUTCH COMMAND CIRCUIT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286968

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E0-00	ST CLUTCH COMMAND CIRCUIT (Steering clutch command circuit)	Malfunction current in steering clutch activation circuit is detected.

POSSIBLE CAUSE

- Steering clutch
- Steering clutch circuit is open or short.
- Steering force control module

FAIL-SAFE

- MODE 2

NOTE:

For details of fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-343, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286969

1. CHECK THE STEERING CLUTCH

Check the steering clutch. Refer to [STC-344, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-96, "Removal and Installation"](#).

2. CHECK THE CLUTCH CIRCUIT

1. Disconnect steering force control module.
2. Check the continuity between steering force control module harness connector and steering clutch harness connector.

C13E0-00 ST CLUTCH COMMAND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPIVE STEERING]

Steering force control module		Steering clutch		Continuity
Connector	Terminal	Connector	Terminal	
M71	26	M156	1	Existed
	28		3	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	26	Ground	Not existed
	28		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000011286970

1.CHECK THE STEERING CLUTCH

1. Turn the ignition switch OFF.
2. Disconnect steering clutch harness connector.
3. Check continuity between steering clutch connector pin terminals.

Steering clutch motor		Continuity
Terminal		
1	3	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-96, "Removal and Installation"](#).

C13E1-00 STEERING CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E1-00 STEERING CLUTCH

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286971

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E1-00	STEERING CLUTCH (Steering clutch)	Malfunction of steering clutch is detected.

POSSIBLE CAUSE

- Steering clutch
- Steering clutch circuit is open or short.

FAIL-SAFE

- MODE 2

NOTE:

For details of fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-345, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286972

1. CHECK THE CLUTCH CIRCUIT

1. Disconnect steering force control module.
2. Check the continuity between steering force control module harness connector and steering clutch harness connector.

Steering force control module		Steering clutch		Continuity
Connector	Terminal	Connector	Terminal	
M71	26	M156	1	Existed
	28		3	

3. Check the continuity between control module harness connector and ground.

C13E1-00 STEERING CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		—	Continuity
Connector	Terminal		
M71	26	Ground	Not existed
	28		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK THE STEERING CLUTCH

Check the steering clutch. Refer to [STC-346, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> Check the intermittent incident. Refer to [STC-418, "Removal and Installation"](#).

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-96, "Removal and Installation"](#).

EPS/DAST 3 : Component Inspection

INFOID:000000011286973

1.CHECK THE STEERING CLUTCH

1. Turn the ignition switch OFF.
2. Disconnect steering clutch harness connector.
3. Check continuity between steering clutch connector pin terminals.

Steering clutch motor		Continuity
Terminal		
1	3	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-96, "Removal and Installation"](#).

C13E2-00 FRONT WHEEL SENSOR SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E2-00 FRONT WHEEL SENSOR SIGNAL

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286974

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E2-00	FRONT WHEEL SENSOR SIGNAL (Front wheel sensor signal)	Malfunction value of front wheel sensor (both side) is detected.

POSSIBLE CAUSE

- Using the 2 wheel chassis dynamometer
- Continuing the slip condition for long time
- Front wheel sensor

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Turn the steering wheel.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-347, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286975

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

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "ABS".

Is any DTC detected?

- YES >> Check the DTC. Refer to [BRC-58, "DTC Index"](#).
NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch OFF and wait for at least 10 seconds.
2. Turn the ignition switch ON.
3. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13C7-00" or "C13E2-00" detected?

- YES-1 >> C13C7-00 is detected: Refer to [STC-290, "EPS/DAST 3 : DTC Description"](#).
YES-2 >> C13E2-00 is detected: Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

C13E3-00 SPIRAL CABLE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E3-00 SPIRAL CABLE PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286976

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E3-00	SPIRAL CABLE PROTECTION (Spiral cable protection)	Spiral cable protection function is active by steering the steering wheel over the limit angle.

POSSIBLE CAUSE

- Steering the steering wheel over the limit angle
- Steering force control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-51, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E3-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-348, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> Spiral cable protection function is active temporarily by steering the steering wheel over the limit angle. This is not system malfunction.

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286977

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel to the center position.

CAUTION:

Never touch the steering wheel after setting it to center position.

6. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E3-00" detected?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Spiral cable protection function is active by steering the steering wheel over the limit angle. This is not system malfunction.

C13E4-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E4-00 ST CLUTCH RELEASE PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286978

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E4-00	ST CLUTCH RELEASE PROTECTION (Steering clutch release protection)	When steering clutch is released, steering clutch is not released within regular time.

POSSIBLE CAUSE

- When steering clutch is released, overloading the steering wheel.
- Steering clutch
- Steering force control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-51, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

- Never drive the vehicle.
- Never touch the steering wheel.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E4-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-349, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> Steering clutch protection function is active temporarily by overloading the steering wheel. This is not system malfunction.

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286979

1. CHECK THE CLUTCH CIRCUIT

1. Disconnect steering force control module.
2. Check the continuity between steering force control module harness connector and steering clutch harness connector.

Steering force control module		Steering clutch		Continuity
Connector	Terminal	Connector	Terminal	
M71	26	M156	1	Existed
	28		3	

3. Check the continuity between control module harness connector and ground.

C13E4-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		—	Continuity
Connector	Terminal		
M71	26	Ground	Not existed
	28		

Is the inspection result normal?

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

2.CHECK THE STEERING CLUTCH

Check the steering clutch. Refer to [STC-350. "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-96. "Removal and Installation"](#).

3.PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E4-00" detected?

- YES >> GO TO 4.
- NO >> Steering clutch protection function is active by overloading the steering wheel. This is not system malfunction.

4.CHECK DATA MONITOR

 with CONSULT

1. Start the engine.
2. On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
3. Check the value.

CAUTION:

Never steer the steering wheel

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	Approx. ± 8.5 N-m

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).
- NO >> Replace steering clutch assembly. Refer to [ST-96. "Removal and Installation"](#).

EPS/DAST 3 : Component Inspection

INFOID:0000000011286980

1.CHECK THE STEERING CLUTCH

1. Turn the ignition switch OFF.
2. Disconnect steering clutch harness connector.
3. Check continuity between steering clutch connector pin terminals.

C13E4-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPIVE STEERING]

Steering clutch		Continuity
Terminal		
1	3	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-96. "Removal and Installation"](#).

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C13E5-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E5-00 ST CLUTCH RELEASE PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286981

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E5-00	ST CLUTCH RELEASE PROTECTION (Steering clutch release protection)	When steering clutch is released, steering clutch is not released in spite of trying to release it many times.

POSSIBLE CAUSE

- When steering clutch is released, overloading steering wheel.
- Steering clutch
- Steering force control module

FAIL-SAFE

- MODE 2

NOTE:

For details of fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E5-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-352, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> Steering clutch protection function is active temporarily by overloading the steering wheel. This is not system malfunction.

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286982

1. CHECK THE CLUTCH CIRCUIT

1. Disconnect steering force control module.
2. Check the continuity between steering force control module harness connector and steering clutch harness connector.

Steering force control module		Steering clutch		Continuity
Connector	Terminal	Connector	Terminal	
M71	26	M156	1	Existed
	28		3	

3. Check the continuity between control module harness connector and ground.

C13E5-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		—	Continuity
Connector	Terminal		
M71	26	Ground	Not existed
	28		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK THE STEERING CLUTCH

Check the steering clutch. Refer to [STC-353, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-96, "Removal and Installation"](#).

3. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E5-00" detected?

YES >> GO TO 4.

NO >> Steering clutch protection function is active by overloading the steering wheel. This is not system malfunction.

4. CHECK DATA MONITOR

 with CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "EPS/DAST 3" >>> "DATA MONITOR" >> "TORQUE SEN MAIN 1".
3. Check the value.

CAUTION:

Never steer the steering wheel

Monitor item	Standard value (Approx.)
TORQUE SEN MAIN 1	Approx. ± 8.5 N·m

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Replace steering clutch. Refer to [ST-96, "Removal and Installation"](#).

EPS/DAST 3 : Component Inspection

INFOID:0000000011286983

1. CHECK THE STEERING CLUTCH

1. Turn the ignition switch OFF.
2. Disconnect steering clutch harness connector.
3. Check continuity between steering clutch connector pin terminals.

C13E5-00 ST CLUTCH RELEASE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering clutch		Continuity
Terminal		
1	3	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Steering clutch is malfunction. Replace steering clutch assembly. Refer to [ST-96. "Removal and Installation"](#).

C13E6-00 HEAT PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E6-00 HEAT PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286984

NOTE:

The DTC "C13E6-00" may be detected due to the high temperature of engine in the following condition.

- Starting the direct adaptive steering system after idling the engine for a long time

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E6-00	HEAT PROTECTION (Heat protection)	The internal temperature of steering force motor reaches 150°C (302°F) or more, and then the protection function operates.

POSSIBLE CAUSE

- Continuing the overloading steering (Sports driving in the circuit etc.)
- Steering force motor

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-51, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-355, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> The temporary rise of steering force motor internal temperature caused the protection function to operate. This is not a system malfunction. INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286985

1. CHECK THE TEMPERATURE OF CONTROL MODULE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "EPS/DAST 3" >> "DATA MONITOR" >> "C/M TEMPERATURE".

3. Wait with the ignition switch OFF until the data monitor indication becomes 140°C (284°F) or less.

Does the temperature drop to 140°C (284°F) or less?

YES >> GO TO 2.

NO >> GO TO 3.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

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C13E6-00 HEAT PROTECTION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E6-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> The rise of steering force motor internal temperature caused the protection function to operate.
This is not a system malfunction. INSPECTION END

3. CHECK TEMPERATURE SENSOR POWER SUPPLY (1)

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Turn the ignition switch ON.
4. Check the voltage between force motor angle sensor harness connector pin terminals.

Force motor angle sensor			Voltage (Approx.)
Connector	Terminal		
	+	-	
M73	3	7	5 V

Is the inspection result normal?

- YES >> GO TO 9.
NO >> GO TO 4.

4. CHECK TEMPERATURE SENSOR POWER SUPPLY (2)

Check the voltage between force motor angle sensor harness connector pin terminals.

Force motor angle sensor			Voltage (Approx.)
Connector	Terminal		
	+	-	
M73	3	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 5.
NO >> GO TO 7.

5. CHECK TEMPERATURE SENSOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering force control module harness connector and force motor angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	29	M73	7	Existed

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK CONTROL MODULE GROUND CIRCUIT

Check the continuity between steering force control module harness connector and ground.

C13E6-00 HEAT PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
M71	30	Ground	Existed
M72	33		

Is the inspection result normal?

YES >> GO TO 10.

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

7. CHECK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering force control module harness connector and force motor angle sensor harness connector.

Steering force control module		Force motor angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
M71	31	M73	3	Existed

4. Check the continuity between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	31	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 8.

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

8. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT

Check the power supply circuit for steering force control module. Refer to [STC-397, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace error-detected part.

9. CHECK TEMPERATURE SENSOR

Check the force motor temperature sensor. Refer to [STC-339, "EPS/DAST 3 : Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Force motor temperature sensor is malfunction. Replace steering column assembly. Refer to [ST-92, "Removal and Installation"](#).

10. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

EPS/DAST 3 : Component Inspection

INFOID:0000000011286986

1. CHECK FORCE MOTOR TEMPERATURE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect force motor angle sensor harness connector.
3. Check resistance between force motor angle sensor connector pin terminals.

C13E6-00 HEAT PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Force motor angle sensor		Condition	Resistance (Approx.)
Terminal			
3	7	0°C	34.8 kΩ
		25°C	10.0 kΩ
		40°C	5.2 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Force motor temperature sensor is malfunction. Replace steering column assembly. Refer to [STC-418. "Removal and Installation"](#).

DAST 1

DAST 1 : DTC Description

INFOID:000000011286987

NOTE:

The DTC "C13E6-00" may be detected due to the high temperature of engine in the following condition.

- Starting the direct adaptive steering system after idling the engine for a long time
- Repeating the engine idling and sports driving in the circuit
- Turning steering wheel in the front tire side face touching an abstraction like curb stone.
- Turning steering wheel repeatedly in the vehicle stopping for a long time.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E6-00	HEAT PROTECTION (Heat protection)	The internal temperature of steering angle main control module reaches 90°C (194°F) or more, and then the protection function operates.

POSSIBLE CAUSE

- Continuing the overloading steering (Sports driving in the circuit etc.)
- Steering force motor

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-51. "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13E6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-359. "DAST 1 : Diagnosis Procedure"](#).

NO >> The temporary rise of steering angle main control module internal temperature caused the protection function to operate. This is not a system malfunction. INSPECTION END

C13E6-00 HEAT PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : Diagnosis Procedure

INFOID:000000011286988

1. CHECK THE TEMPERATURE OF CONTROL MODULE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "DAST 1" >> "DATA MONITOR" >> "C/M TEMPERATURE".

3. Wait with the ignition switch OFF until the data monitor indication becomes 80°C (176°C) or less.

Does the temperature drop to 85°C (185°C) or less?

YES >> GO TO 2.

NO >> Replace steering angle main control module. Refer to [STC-419. "Removal and Installation"](#).

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.

2. Erase self-diagnosis for "DAST 1".

3. Turn the ignition switch OFF and wait for at least 10 seconds.

4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13E6-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419. "Removal and Installation"](#).

NO >> The rise of steering angle main control module internal temperature caused the protection function to operate. This is not a system malfunction. INSPECTION END

DAST 2

DAST 2 : DTC Description

INFOID:000000011286989

NOTE:

The DTC "C13E6-00" may be detected due to the high temperature of engine in the following condition.

- Starting the direct adaptive steering system after idling the engine for a long time
- Repeating the engine idling and sports driving in the circuit
- Turning steering wheel in the front tire side face touching an abstraction like curb stone.
- Turning steering wheel repeatedly in the vehicle stopping for a long time.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E6-00	HEAT PROTECTION (Heat protection)	The internal temperature of steering angle sub control module reaches 90°C (194°F) or more, and then the protection function operates.

POSSIBLE CAUSE

- Continuing the overloading steering (Sports driving in the circuit etc.)
- Steering force motor

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-51. "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

C13E6-00 HEAT PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13E6-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-360, "DAST 2 : Diagnosis Procedure"](#).

NO >> The temporary rise of steering angle sub control module internal temperature caused the protection function to operate. This is not a system malfunction. INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011286990

1. CHECK THE TEMPERATURE OF CONTROL MODULE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. On the CONSULT screen, select "DAST 2" >> "DATA MONITOR" >> "C/M TEMPERATURE".
3. Wait with the ignition switch OFF until the data monitor indication becomes 80°C (176°C) or less.

Does the temperature drop to 85°C (185°C) or less?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13E6-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> The rise of steering angle sub control module internal temperature caused the protection function to operate. This is not a system malfunction. INSPECTION END

C13E7-00 LOW VOLTAGE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E7-00 LOW VOLTAGE PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011286991

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E7-00	LOW VOLTAGE PROTECTION (Low voltage protection)	The power supply voltage of control module is following condition for 1 second or more continuously, and then protection function is active. • Power supply voltage ≤ 9.1 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering force control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-51, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-361, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> Protection function is active temporarily by low battery voltage. This is not system malfunction.

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011286992

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	33	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

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

C13E7-00 LOW VOLTAGE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

2. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.
2. Check the voltage between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

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

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 60A fusible link (#G).
3. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).
NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> Repair or replace error-detected part.

DAST 1

DAST 1 : DTC Description

INFOID:000000011286993

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E7-00	LOW VOLTAGE PROTECTION (Low voltage protection)	The power supply voltage of control module is following condition for 1 second or more continuously, and then protection function is active. <ul style="list-style-type: none">• Power supply voltage ≤ 9.1 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering angle main control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-51, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

C13E7-00 LOW VOLTAGE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13E7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-363. "DAST 1 : Diagnosis Procedure"](#).

NO >> Protection function is active temporarily by low battery voltage. This is not system malfunction.

DAST 1 : Diagnosis Procedure

INFOID:000000011286994

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.

2. Disconnect steering angle main control module harness connector.

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.

2. Check the voltage between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.

2. Check the 100A fusible link (#J).

3. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13. "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

DAST 2

C13E7-00 LOW VOLTAGE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 2 : DTC Description

INFOID:000000011286995

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E7-00	LOW VOLTAGE PROTECTION (Low voltage protection)	The power supply voltage of control module is following condition for 1 second or more continuously, and then protection function is active. <ul style="list-style-type: none">Power supply voltage ≤ 9.1 V

POSSIBLE CAUSE

- Harness and connector
- Battery
- Fusible link
- Power supply circuit
- Steering angle sub control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-51, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13E7-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-364, "DAST 2 : Diagnosis Procedure"](#).

NO >> Protection function is active temporarily by low battery voltage. This is not system malfunction.

DAST 2 : Diagnosis Procedure

INFOID:000000011286996

1. CHECK CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch ON.

C13E7-00 LOW VOLTAGE PROTECTION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

2. Check the voltage between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Check the 100A fusible link (#H).
3. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to [PG-13. "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

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C13E8-00 CURB STONE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E8-00 CURB STONE PROTECTION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011286997

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E8-00	CURB STONE PROTECTION (Curb stone protection)	Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances, and then the protection function is active.

POSSIBLE CAUSE

- Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances.
- Steering gear is out of neutral position. (Large)
- Steering force control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-51. "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Turn the steering wheel from full left stop to full right stop.

NOTE:

Perform the work at the place where curbstones or other substances does not interfere with tire.

3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-366. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011286998

1. CHECK THE STEERING ANGLE

Turn the steering wheel to right and left.

Is the steering angle of right and left same?

YES >> GO TO 2.

NO >> Refer to [STC-403. "Symptom Table"](#).

2. PERFORM SELF-DIAGNOSIS

With CONSULT

C13E8-00 CURB STONE PROTECTION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel to the straight-ahead position. (There is no steering force)
6. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13E8-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

DAST 1

DAST 1 : DTC Description

INFOID:000000011286999

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E8-00	CURB STONE PROTECTION (Curb stone protection)	Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances, and then the protection function is active.

POSSIBLE CAUSE

- Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances.
- Steering gear is out of neutral position. (Large)
- Steering angle main control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection functions, refer to [STC-51. "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 **With CONSULT**

1. Start the engine.
- CAUTION:**
Never drive the vehicle.
2. Turn the steering wheel from full left stop to full right stop.

NOTE:

Perform the work at the place where curbstones or other substances does not interfere with tire.

3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 1".

Is DTC "C13E8-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-368. "DAST 1 : Diagnosis Procedure"](#).

NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not

C13E8-00 CURB STONE PROTECTION

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

DAST 1 : Diagnosis Procedure

INFOID:000000011287000

1. CHECK THE STEERING ANGLE

Turn the steering wheel to right and left.

Is the steering angle of right and left same?

YES >> GO TO 2.

NO >> Refer to [STC-403, "Symptom Table"](#).

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Turn the steering wheel to the straight-ahead position. (There is no steering force)
6. Perform self-diagnosis for "DAST 1".

Is DTC "C13E8-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

DAST 2

DAST 2 : DTC Description

INFOID:000000011287001

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E8-00	CURB STONE PROTECTION (Curb stone protection)	Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances, and then the protection function is active.

POSSIBLE CAUSE

- Steering wheel is operated under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances.
- Steering gear is out of neutral position. (Large)
- Steering angle sub control module

FAIL-SAFE

- Protection mode

NOTE:

For details of protection mode, refer to [STC-51, "DIRECT ADAPTIVE STEERING : Protection Function"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

C13E8-00 CURB STONE PROTECTION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

With CONSULT

1. Start the engine.
2. Turn the steering wheel from full left stop to full right stop.

CAUTION:

Never drive the vehicle.

NOTE:

Perform the work at the place where curbstones or other substances does not interfere with tire.

3. Return the steering wheel to the straight-ahead position.
4. Perform self-diagnosis for "DAST 2".

Is DTC "C13E8-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-369. "DAST 2 : Diagnosis Procedure"](#).
- NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

DAST 2 : Diagnosis Procedure

INFOID:000000011287002

1. CHECK THE STEERING ANGLE

Turn the steering wheel to right and left.

Is the steering angle of right and left same?

- YES >> GO TO 2.
- NO >> Refer to [STC-403. "Symptom Table"](#).

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
 2. Erase self-diagnosis for "DAST 2".
 3. Turn the ignition switch OFF and wait for at least 10 seconds.
 4. Start the engine.
- CAUTION:**
- Never drive the vehicle.**
5. Turn the steering wheel to the straight-ahead position. (There is no steering force)
 6. Perform self-diagnosis for "DAST 2".

Is DTC "C13E8-00" detected?

- YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).
- NO >> Protection function is active by operating steering wheel under a condition where the steering angle is physically restricted due to the influence of curbstones or other substances. This is not system malfunction. Since this may cause mechanical malfunction, check the suspension, axle and steering component.

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C13E9-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13E9-00 BOOTING ANGLE PROCESSING

DAST 1

DAST 1 : DTC Description

INFOID:000000011287003

NOTE:

During engine start, the DTC "C13E9-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13E9-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is detected when control module is starting.

POSSIBLE CAUSE

- The malfunction of processing information

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13E9-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-370, "DAST 1 : Diagnosis Procedure"](#).

NO >> INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011287004

1. CHECK THE SELF-DIAGNOSTIC RESULT

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3" and "DAST 2".
3. Check the diagnostic result for "EPS/DAST 3", "DAST 1" and "DAST 2".

What is DTC detected with DTC "C13E9-00"?

C13C5-00>>Refer to [STC-286, "EPS/DAST 3 : Diagnosis Procedure"](#).

C13D1-00>>Refer to [STC-299, "DAST 1 : Diagnosis Procedure"](#).

C13D2-00>>Refer to [STC-301, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-302, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-303, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13D3-00>>Refer to [STC-304, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-305, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-306, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13D4-00>>Refer to [STC-307, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-309, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-311, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13E9-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- C13D5-00>>Refer to [STC-313, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-314, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-315, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D6-00>>Refer to [STC-316, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-317, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-318, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D7-00>>Refer to [STC-319, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-320, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-321, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D8-00>>Refer to [STC-322, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-324, "DAST 1 : Diagnosis Procedure"](#) (DAST 1).
- C13D9-00>>Refer to [STC-326, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-327, "DAST 1 : Diagnosis Procedure"](#) (DAST 1).
- C13DB-00>>Refer to [STC-328, "DAST 1 : Diagnosis Procedure"](#).
- C13DC-00>>Refer to [STC-331, "DAST 1 : Diagnosis Procedure"](#).
- C13DD-00>>Refer to [STC-334, "DAST 1 : Diagnosis Procedure"](#).
- C13DF-00>>Refer to [STC-342, "DAST 1 : Diagnosis Procedure"](#).
- C13EA-00>>Refer to [STC-372, "EPS/DAST 3 : Diagnosis Procedure"](#).
- C13F0-00>>Refer to [STC-385, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-386, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-387, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13F1-00>>Refer to [STC-388, "EPS/DAST 3 : Diagnosis Procedure"](#).

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C13EA-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13EA-00 BOOTING ANGLE PROCESSING

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011287005

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EA-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is detected when control module is starting.

POSSIBLE CAUSE

- The malfunction of processing information

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13EA-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-372. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011287006

1. CHECK THE SELF-DIAGNOSTIC RESULT

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1" and "DAST 2".
3. Check the diagnostic result for "EPS/DAST 3", "DAST 1" and "DAST 2".

What is DTC detected with DTC "C13EA-00"?

C13C5-00>>Refer to [STC-286. "EPS/DAST 3 : Diagnosis Procedure"](#).

C13D1-00>>Refer to [STC-299. "DAST 1 : Diagnosis Procedure"](#).

C13D2-00>>Refer to [STC-301. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-302. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-303. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13D3-00>>Refer to [STC-304. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-305. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-306. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13D4-00>>Refer to [STC-307. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-309. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-311. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13EA-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- C13D5-00>>Refer to [STC-313. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-314. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-315. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D6-00>>Refer to [STC-316. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-317. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-318. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D7-00>>Refer to [STC-319. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-320. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-321. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

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C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13EB-00 BOOTING ANGLE PROCESSING

DAST 1

DAST 1 : DTC Description

INFOID:0000000011287007

NOTE:

During engine start, the DTC "C13EB-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EB-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is detected when control module is starting.

POSSIBLE CAUSE

- The malfunction of processing information

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13EB-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-374, "DAST 1 : Diagnosis Procedure"](#).

NO >> INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000011287008

1. CHECK THE SELF-DIAGNOSTIC RESULT

Ⓟ With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3" and "DAST 2".
3. Check the diagnostic result for "EPS/DAST 3", "DAST 1" and "DAST 2".

What is DTC detected with DTC "C13EB-00"?

C13D1-00>>Refer to [STC-299, "DAST 1 : Diagnosis Procedure"](#).

C13D2-00>>Refer to [STC-301, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-302, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-303, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13D3-00>>Refer to [STC-304, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-305, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-306, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13D4-00>>Refer to [STC-307, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-309, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-311, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

C13EB-00 BOOTING ANGLE PROCESSING

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- C13D5-00>>Refer to [STC-313. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-314. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-315. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D6-00>>Refer to [STC-316. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-317. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-318. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D7-00>>Refer to [STC-319. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-320. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-321. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13E9-00>>Refer to [STC-370. "DAST 1 : Diagnosis Procedure"](#).

DAST 2

DAST 2 : DTC Description

INFOID:000000011287009

NOTE:

During engine start, the DTC "C13EB-00" may be detected due to temporary low voltage.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EB-00	BOOTING ANGLE PROCESSING (Booting angle processing)	The malfunction of processing to acquire angle information is detected when control module is starting.

POSSIBLE CAUSE

- The malfunction of processing information

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13EB-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-375. "DAST 2 : Diagnosis Procedure"](#).
- NO >> INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011287010

1. CHECK THE SELF-DIAGNOSTIC RESULT

With CONSULT

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3" and "DAST 2".
3. Check the diagnostic result for "EPS/DAST 3", "DAST 1" and "DAST 1".

What is DTC detected with DTC "C13EB-00"?

- C13D1-00>>Refer to [STC-299. "DAST 1 : Diagnosis Procedure"](#).
- C13D2-00>>Refer to [STC-301. "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-302. "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-303. "DAST 2 : Diagnosis Procedure"](#) (DAST 2).

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C13EB-00 BOOTING ANGLE PROCESSING

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

- C13D3-00>>Refer to [STC-304, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-305, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-306, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D4-00>>Refer to [STC-307, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-309, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-311, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D5-00>>Refer to [STC-313, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-314, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-315, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D6-00>>Refer to [STC-316, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-317, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-318, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13D7-00>>Refer to [STC-319, "EPS/DAST 3 : Diagnosis Procedure"](#) (EPS/DAST 3), [STC-320, "DAST 1 : Diagnosis Procedure"](#) (DAST 1), [STC-321, "DAST 2 : Diagnosis Procedure"](#) (DAST 2).
- C13E9-00>>Refer to [STC-370, "DAST 1 : Diagnosis Procedure"](#).

C13EE-00 INCOMP CONFIG

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011287011

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EE-00	INCOMP CONFIG (Incomplete config)	Configuration of one control module at least in three control modules is wrong or incomplete.

POSSIBLE CAUSE

- Configuration of one control module at least in three control modules is wrong or incomplete.

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

 With CONSULT

1. Start engine.
CAUTION:
Never drive the vehicle.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13EE-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-377. "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011287012

1. PERFORM CONFIGURATION

Perform configuration for each control module. Refer to [STC-130. "Work Procedure"](#) (EPS/DAST 3), [STC-132. "Work Procedure"](#) (DAST 1), [STC-134. "Work Procedure"](#) (DAST 2).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

 With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13EE-00" detected?

- YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

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< DTC/CIRCUIT DIAGNOSIS >

NO >> INSPECTION END

DAST 1

DAST 1 : DTC Description

INFOID:0000000011287013

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EE-00	INCOMP CONFIG (Incomplete config)	Configuration of one control module at least in three control modules is wrong or incomplete.

POSSIBLE CAUSE

- Configuration of one control module at least in three control modules is wrong or incomplete.

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13EE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-378, "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000011287014

1. PERFORM CONFIGURATION

Perform configuration for each control module. Refer to [STC-130, "Work Procedure"](#) (EPS/DAST 3), [STC-132, "Work Procedure"](#) (DAST 1), [STC-134, "Work Procedure"](#) (DAST 2).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13EE-00" detected?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

< DTC/CIRCUIT DIAGNOSIS >

NO >> INSPECTION END

DAST 2

DAST 2 : DTC Description

INFOID:0000000011287015

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EE-00	INCOMP CONFIG (Incomplete config)	Configuration of one control module at least in three control modules is wrong or incomplete.

POSSIBLE CAUSE

- Configuration of one control module at least in three control modules is wrong or incomplete.

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13EE-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-379, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:0000000011287016

1. PERFORM CONFIGURATION

Perform configuration for each control module. Refer to [STC-130, "Work Procedure"](#) (EPS/DAST 3), [STC-132, "Work Procedure"](#) (DAST 1), [STC-134, "Work Procedure"](#) (DAST 2).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13EE-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

C13EE-00 INCOMP CONFIG

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

NO >> INSPECTION END

C13EF-00 CONFIG CHECK RESULT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13EF-00 CONFIG CHECK RESULT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011287017

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EF-00	CONFIG CHECK RESULT (Config checking result)	Configuration result of control module is malfunction.

POSSIBLE CAUSE

- Incomplete of configuration for steering force control module
- Mistake of configuration for steering force control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13EF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-381, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011287018

1. PERFORM CONFIGURATION

Perform configuration for control module. Refer to [STC-130, "Work Procedure"](#).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13EF-00" detected?

YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

C13EF-00 CONFIG CHECK RESULT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> INSPECTION END

DAST 1

DAST 1 : DTC Description

INFOID:0000000011287019

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EF-00	CONFIG CHECK RESULT (Config checking result)	Configuration result of control module is malfunction.

POSSIBLE CAUSE

- Incomplete of configuration for steering angle main control module
- Mistake of configuration for steering angle main control module
- Incomplete of configuration for steering angle main control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 1".

Is DTC "C13EF-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-382. "DAST 1 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:0000000011287020

1. PERFORM CONFIGURATION

Perform configuration for control module. Refer to [STC-132. "Work Procedure"](#).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 1".

Is DTC "C13EF-00" detected?

C13EF-00 CONFIG CHECK RESULT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace steering angle main control module. Refer to [STC-419. "Removal and Installation"](#).
- NO >> INSPECTION END

DAST 2

DAST 2 : DTC Description

INFOID:0000000011287021

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13EF-00	CONFIG CHECK RESULT (Config checking result)	Configuration result of control module is malfunction.

POSSIBLE CAUSE

- Incomplete of configuration for steering angle sub control module
- Mistake of configuration for steering angle sub control module

FAIL-SAFE

- Mode 3

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#)

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Start engine.

CAUTION:

Never drive the vehicle.

2. Perform self-diagnosis for "DAST 2".

Is DTC "C13EF-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-379. "DAST 2 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:0000000011287022

1. PERFORM CONFIGURATION

Perform configuration for control module. Refer to [STC-134. "Work Procedure"](#).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Start engine.

CAUTION:

Never drive the vehicle.

5. Perform self-diagnosis for "DAST 2".

Is DTC "C13EF-00" detected?

C13EF-00 CONFIG CHECK RESULT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).
NO >> INSPECTION END

C13F0-00 INCOMP DAST CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13F0-00 INCOMP DAST CALIBRATION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011287023

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F0-00	INCOMP DAST CALIBRATION (Incomplete direct adaptive steering calibration)	Initial learning of direct adaptive steering is incomplete.

POSSIBLE CAUSE

- Incomplete of direct adaptive steering initial learning.

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13F0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-385. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011287024

1. PERFORM CALIBRATION

Perform the working including "DAST CALIBRATION (MODE1)" performed just before from the first. Refer to [STC-123. "Work Procedure"](#).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13F0-00" detected?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> INSPECTION END

DAST 1

C13F0-00 INCOMP DAST CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DAST 1 : DTC Description

INFOID:000000011287025

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F0-00	INCOMP DAST CALIBRATION (Incomplete direct adaptive steering calibration)	Initial learning of direct adaptive steering is incomplete.

POSSIBLE CAUSE

- Incomplete of direct adaptive steering initial learning.

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13F0-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-386, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011287026

1.PERFORM CALIBRATION

Perform the working including "DAST CALIBRATION (MODE1)" performed just before from the first. Refer to [STC-123, "Work Procedure"](#).

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 1".

Is DTC "C13F0-00" detected?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
NO >> INSPECTION END

DAST 2

DAST 2 : DTC Description

INFOID:000000011287027

DTC DETECTION LOGIC

C13F0-00 INCOMP DAST CALIBRATION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F0-00	INCOMP DAST CALIBRATION (Incomplete direct adaptive steering calibration)	Initial learning of direct adaptive steering is incomplete.

POSSIBLE CAUSE

- Incomplete of direct adaptive steering initial learning.

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 2".

Is DTC "C13F0-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-387, "DAST 2 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:0000000011287028

1. PERFORM CALIBRATION

Perform the working including "DAST CALIBRATION (MODE1)" performed just before from the first. Refer to [STC-123, "Work Procedure"](#).

>> GO TO 2.

2. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 2".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 2".

Is DTC "C13F0-00" detected?

YES >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

NO >> INSPECTION END

C13F1-00 INCOMP ST ANG SEN ADJST

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

C13F1-00 INCOMP ST ANG SEN ADJST EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011287029

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F1-00	INCOMP ST ANG SEN ADJST Incomplete steering angle sensor adjustment	Steering angle sensor neutral position adjustment is incomplete

POSSIBLE CAUSE

- In complete of steering angle sensor neutral position adjustment

FAIL-SAFE

- Mode 2

NOTE:

For fail-safe mode, refer to [STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13F1-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-388. "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011287030

1. PERFORM CALIBRATION

Perform the working including "DAST CALIBRATION (MODE1)" performed just before from the first. Refer to [STC-123. "Work Procedure"](#).

>> GO TO 2.

2. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Adjust neutral position of steering angle sensor. Refer to [BRC-71. "Work Procedure"](#).

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13F1-00" detected?

C13F1-00 INCOMP ST ANG SEN ADJST

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).
NO >> INSPECTION END

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C13F2-00 MISMATCHED SOFTWARE VERSION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

C13F2-00 MISMATCHED SOFTWARE VERSION

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:000000011287031

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F2-00	DIFFERENT SOFTWARE VERSION (Different software version)	The software version of each control module is different.

POSSIBLE CAUSE

- The software version of steering force control module, steering angle main control module and steering angle main control module is different.

FAIL-SAFE

- Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "C13F2-00" detected?

YES >> Proceed to diagnosis procedure. Refer to [STC-390, "EPS/DAST 3 : Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:000000011287032

1. CHECK THE WORK

Check the work performed just before.

What is the work performed just before?

RE/PROGRAMMING>>Perform the "RE/PROGRAMMING" according to the procedure. Refer to "CONSULT Operation Manual",

Replacing control module>>When replacing the control module, replace three control modules as a set. Refer to [STC-418, "Removal and Installation"](#), [STC-419, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#). After replacing three control modules, perform the self-diagnosis again, and then check that DTC "C13F2-00" is not detected.

DAST 1

DAST 1 : DTC Description

INFOID:000000011287033

DTC DETECTION LOGIC

C13F2-00 MISMATCHED SOFTWARE VERSION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F2-00	DIFFERENT SOFTWARE VERSION (Different software version)	The software version of each control module is different.

POSSIBLE CAUSE

- The software version of steering force control module, steering angle main control module and steering angle main control module is different.

FAIL-SAFE

- Mode 2 or Mode 3

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "C13F2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-390, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011287034

1. CHECK THE WORK

Check the work performed just before.

What is the work performed just before?

- RE/PROGRAMMING>>Perform the "RE/PROGRAMMING" according to the procedure. Refer to "CONSULT Operation Manual",
- Replacing control module>>When replacing the control module, replace three control modules as a set. Refer to [STC-418, "Removal and Installation"](#), [STC-419, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#). After replacing three control modules, perform the self-diagnosis again, and then check that DTC "C13F2-00" is not detected.

DAST 2

DAST 2 : DTC Description

INFOID:000000011287035

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C13F2-00	DIFFERENT SOFTWARE VERSION (Different software version)	The software version of each control module is different.

POSSIBLE CAUSE

- The software version of steering force control module, steering angle main control module and steering angle main control module is different.

FAIL-SAFE

- Mode 2 or Mode 3

C13F2-00 MISMATCHED SOFTWARE VERSION

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

NOTE:

For fail-safe mode, refer to [STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe"](#).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 2".

Is DTC "C13F2-00" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-390, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 2 : Diagnosis Procedure

INFOID:000000011287036

1.CHECK THE WORK

Check the work performed just before.

What is the work performed just before?

- RE/PROGRAMMING>>Perform the "RE/PROGRAMMING" according to the procedure.Refer to "CONSULT Operation Manual",
Replacing control module>>When replacing the control module, replace three control modules as a set. Refer to [STC-418, "Removal and Installation"](#), [STC-419, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#). After replacing three control modules, perform the self-diagnosis again, and then check that DTC"C13F2-00" is not detected.

U1000-01 CAN COMM CIRCUIT

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011287037

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 communicate data but selectively reads required data only.

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
U1000-01	CAN COMM CIRCUIT (CAN communication circuit)	Steering force control module is not transmitting/receiving CAN communication signal for 2 seconds or more.

POSSIBLE CAUSE

- CAN communication error
- CAN communication line

FAIL-SAFE

- System continue normal control.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "U1000-01" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-393. "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011287038

Proceed to [LAN-24. "Trouble Diagnosis Flow Chart"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011287039

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 (CANH line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

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U1000-01 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
U1000-01	CAN COMM CIRCUIT (CAN communication circuit)	Steering angle main control module is not transmitting/receiving CAN communication signal for 2 seconds or more.

POSSIBLE CAUSE

- CAN communication error
- CAN communication line

FAIL-SAFE

- System continue normal control.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "U1000-01" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-394, "DAST 1 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011287040

Proceed to [LAN-24, "Trouble Diagnosis Flow Chart"](#).

U1010-49 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

U1010-49 CONTROL UNIT (CAN)

EPS/DAST 3

EPS/DAST 3 : DTC Description

INFOID:0000000011287041

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 communicate data but selectively reads required data only.

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition
U1010-49	CONTROL UNIT(CAN)	When detecting error during the initial diagnosis of CAN controller to steering force control module.

POSSIBLE CAUSE

- Steering force control module internal error

FAIL-SAFE

- System continue normal control.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

Ⓜ With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "U1010-49" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-393, "EPS/DAST 3 : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

EPS/DAST 3 : Diagnosis Procedure

INFOID:0000000011287042

1. PERFORM SELF-DIAGNOSIS

Ⓜ With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "EPS/DAST 3".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "EPS/DAST 3".

Is DTC "U1010-49" detected?

- YES >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).
NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

DAST 1

DAST 1 : DTC Description

INFOID:0000000011287043

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 elec-

U1010-49 CONTROL UNIT (CAN)

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

tronic 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 communicate data but selectively reads required data only.

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition
U1010-49	CONTROL UNIT(CAN)	When detecting error during the initial diagnosis of CAN controller to steering angle main control module.

POSSIBLE CAUSE

- Steering angle main control module internal error

FAIL-SAFE

- System continue normal control.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

1. Turn the ignition switch ON.
2. Perform self-diagnosis for "DAST 1".

Is DTC "U1010-49" detected?

- YES >> Proceed to diagnosis procedure. Refer to [STC-393, "EPS/DAST 3 : Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

DAST 1 : Diagnosis Procedure

INFOID:000000011287044

1.PERFORM SELF-DIAGNOSIS

With CONSULT

1. Turn the ignition switch ON.
2. Erase self-diagnosis for "DAST 1".
3. Turn the ignition switch OFF and wait for at least 10 seconds.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for "DAST 1".

Is DTC "U1010-49" detected?

- YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).
- NO >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

POWER SUPPLY AND GROUND CIRCUIT

DTC Description

INFOID:0000000011287045

Diagnosis Procedure

INFOID:0000000011287046

1. CHECK STEERING FORCE CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	33	Ground	Existed

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair open circuit in harness or connectors.

2. CHECK STEERING ANGLE MAIN CONTROL MODULE GROUND CIRCUIT

1. Disconnect steering angle main control module harness connector.
2. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Existed
E28	39		

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair open circuit in harness or connectors.

3. CHECK STEERING ANGLE SUB CONTROL MODULE GROUND CIRCUIT

1. Disconnect steering angle sub control module harness connector.
2. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Existed
E31	39		

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair open circuit in harness or connectors.

4. CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Disconnect steering force control module harness connector.
2. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> GO TO 6.
NO >> GO TO 5.

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POWER SUPPLY AND GROUND CIRCUIT

[DIRECT ADAPTIVE STEERING]

< DTC/CIRCUIT DIAGNOSIS >

5. CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 60A fusible link (#G).
2. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

6. CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 7.

7. CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

8. CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 9.

9. CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#H).
2. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

10. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

- Turn the ignition switch ON.
- Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

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

11.CHECK IGNITION POWER SUPPLY CIRCUIT (1)

- Turn the ignition switch OFF.
- Disconnect steering angle sub control module harness connector.
- Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

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

12.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle sub control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

- YES >> GO TO 13.
NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

13.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

- Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

- Turn the ignition switch ON.
- Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

- YES >> Perform intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).
NO >> GO TO 14.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

14. CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair or replace error-detected parts.

15. CHECK INTERNAL CIRCUIT IN STEERING FORCE CONTROL MODULE

Check the continuity between steering force control module connector terminals.

Steering force control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

16. CHECK IGNITION POWER SUPPLY FOR STEERING FORCE CONTROL MODULE

1. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	0 V

2. Turn the ignition switch ON.

3. Check the voltage between force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

NO >> GO TO 17.

17. CHECK IGNITION POWER SUPPLY CIRCUIT (3)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#12).
3. Disconnect fuse block (J/B) harness connector.
4. Check the continuity between steering force control module connector and fuse block (J/B).

Steering force control module		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M71	25	M133	20C	Existed

5. Check the continuity between steering force control module connector and ground.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	Not existed

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-57, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).
- NO >> Repair or replace error-detected parts.

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POWER STEERING WARNING LAMP

Component Function Check

INFOID:0000000011287047

1. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

Check that the power steering warning lamp turns ON when ignition switch turns ON. Then, power steering warning lamp turns OFF after the engine is started.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Perform trouble diagnosis. Refer to [STC-397, "Diagnosis Procedure"](#)

Diagnosis Procedure

INFOID:0000000011287048

1. PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for "EPS/DAST 3", "DAST 1" and "DAST 2".

Is any DTC detected?

YES >> Check the DTC. Refer to [STC-79, "DTC Index"](#) (EPS/DAST 3), [STC-92, "DTC Index"](#) (DAST 1) and [STC-105, "DTC Index"](#) (DAST 2).

NO >> GO TO 2.

2. CHECK POWER STEERING WARNING LAMP SIGNAL

With CONSULT

1. Turn the ignition switch ON.
2. On CONSULT screen, select "METER/M&A" >> "DATA MONITOR" >> "EPS W/L".
3. Check that the item in "DATA MONITOR" is "On".
4. Start the engine.

CAUTION:

Never drive the vehicle.

5. Check that the item in "DATA MONITOR" is "Off".

Is the inspection result normal?

YES >> Perform the trouble diagnosis for combination meter power supply circuit. Refer to [MWI-104, "COMBINATION METER : Diagnosis Procedure"](#).

NO >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

SYMPTOM DIAGNOSIS

SYSTEM SYMPTOM

Symptom Table

INFOID:0000000011287049

Symptom	Warning lamp	Possible cause	Diagnosis method	Priority
While driving the vehicle, steering wheel is off-center.	ON	Fail safe mode 2 For fail-safe mode, refer to STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis	1
	OFF*	Protection mode For protection function, refer to STC-51, "DIRECT ADAPTIVE STEERING : Protection Function" .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in normal condition.	2
	OFF	Mistake of calibration procedure.	Perform self-diagnosis When DTC is not detected, refer to STC-123, "Work Procedure" .	2
The vehicle pulls to one direction.	OFF	<ul style="list-style-type: none"> Steering wheel is off-center slightly. Steering wheel is off-center temporarily. 	Perform symptom diagnosis "THE VEHICLE PULLS TO ONE SIDE" Refer to STC-406, "Diagnosis Procedure" .	1
<ul style="list-style-type: none"> When turning the steering wheel from full left stop to full right stop, the sound is heard from left or right side. When turning the steering wheel from full left stop to full right stop, it is not able to turn until halfway position of left or right. 	The vehicle pulls to one direction.	<ul style="list-style-type: none"> Steering wheel is off-center slightly. Steering wheel is off-center temporarily. 	Perform symptom diagnosis "THE VEHICLE PULLS TO ONE SIDE" Refer to STC-406, "Diagnosis Procedure" .	1
	The vehicle does not pull to one direction.	OFF	The neutral position of the vehicle's alignment and the neutral position of the steering rack are off-center.	Perform "TOE-IN ADJUSTMENT" with alignment tester. Refer to ST-83, "ALIGNMENT TESTER : Inspection and Adjustment" . CAUTION: Be sure to use alignment tester for the symptom.
<ul style="list-style-type: none"> Steering gear ratio changes Steering wheel turning force is heavy 	ON	Fail safe mode 2 or 3 For fail-safe mode, refer to STC-48, "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis	1
	OFF*	Protection mode For protection function, refer to STC-51, "DIRECT ADAPTIVE STEERING : Protection Function" .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in normal condition.	2
	OFF	Steering mode is except "Normal". For steering mode, refer to STC-41, "DIRECT ADAPTIVE STEERING : System Description" .	Not required NOTE: Since the steering mode is except "Normal", steering characteristic is changed. This is control in normal condition.	3

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Symptom	Warning lamp	Possible cause	Diagnosis method	Priority
Steering wheel turning force is light	ON	Fail safe mode 2 For fail-safe mode, refer to STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis	1
	OFF*	Protection mode For protection function, refer to STC-51. "DIRECT ADAPTIVE STEERING : Protection Function" .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in normal condition.	2
	OFF	Steering mode is except "Normal". For steering mode, refer to STC-41. "DIRECT ADAPTIVE STEERING : System Description" .	Not required NOTE: Since the steering mode is except "Normal", steering characteristic is changed. This is control in normal condition.	3
Vibration / Noise occurs	ON	Fail safe mode 2 (Operation sound of steering clutch) For fail-safe mode, refer to STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis	1
	OFF*	Protection mode (Operation sound of steering clutch) For protection function, refer to STC-51. "DIRECT ADAPTIVE STEERING : Protection Function" .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in normal condition.	2
	OFF	Operating sound of steering force actuator	Not required NOTE: This is an operating sound in normal condition of direct adaptive steering.	3
	OFF	Operating sound of steering angle actuator		
When start the engine, sound is heard.	ON	Malfunction of steering clutch (When sound is abnormal sound.)	Perform self-diagnosis	1
	OFF	Operating sound of steering clutch	Not required NOTE: This is an operating sound in normal condition of direct adaptive steering.	
Unbalance steering wheel turning force (torque variation)	ON	Fail safe mode 2 For fail-safe mode, refer to STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis	1
	OFF*	Protection mode For protection function, refer to STC-51. "DIRECT ADAPTIVE STEERING : Protection Function" .	Perform self-diagnosis NOTE: When DTC is detected as "PAST", this is control in normal condition.	2

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Symptom	Warning lamp	Possible cause	Diagnosis method	Priority	
When starting the engine ⇔ turning the ignition switch OFF, steering wheel moves.	OFF	Starting the engine in the condition that steering angle is over 360 degree	Not required NOTE: The gear ration is different between direct adaptive steering mode and others.if steering angle is over 360 degree when engine starts, the system adjust it.	2	A B C
	ON	Malfunction of steering clutch	Perform self-diagnosis NOTE: When starting the engine ⇔ turning the ignition switch OFF, it is normal that the steering wheel slightly moves.	1	D E
When turning quickly, the vehicle follows slowly compared with turning normally.	ON	Fail safe mode 1 For fail-safe mode, refer to STC-48. "DIRECT ADAPTIVE STEERING : Fail-safe" .	Perform self-diagnosis NOTE: After the system starts again, system is in fail-safe mode 3.	1	F
When turning the steering wheel from full left stop to full right stop, steering reaction force is light.	OFF	The output of steering force motor decreases.	Not required NOTE: System decrease the output of steering force motor to avoid overheating steering force motor. This is control in normal condition of direct adaptive steering.	1	STC H I

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THE VEHICLE PULLS TO ONE SIDE

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

THE VEHICLE PULLS TO ONE SIDE

Description

INFOID:000000011287050

When driving the vehicle, the vehicle pulls to one direction.

Diagnosis Procedure

INFOID:000000011287051

1. CHECK THE ILLUMINATION OF THE POWER STEERING WARNING LAMP

1. Start the engine.

CAUTION:

Never drive the vehicle.

2. Check that the power steering warning lamp turns OFF.

Does the power steering warning lamp turn OFF?

YES >> GO TO 2.

NO >> Perform self-diagnosis for "EPS/DAST 3", "DAST 1" and "DAST 2".

- EPS/DAST 3: Refer to [STC-79, "DTC Index"](#).
- DAST 1: Refer to [STC-92, "DTC Index"](#).
- DAST 2: Refer to [STC-105, "DTC Index"](#).

2. AUTO ADJUSTING MODE (1)

1. Turn the steering wheel to left/right 90 degree or more from center position 2 times.
2. Drive straight ahead at around 30 km/h (19 MPH) for more than 5 seconds.

CAUTION:

- **Drive on a straight flat road.**
- **Keep the steering wheel, so the vehicle stays in a straight line.**

NOTE:

Drive at between 30 km/h (19 MPH) and 40 km/h (25 MPH), as much as possible. It is easy to succeed with the work.

3. Stop the vehicle.

>> GO TO 3.

3. SYMPTOM CONFIRMATION

Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom corrected?

YES >> INSPECTION END

NO >> GO TO 4.

4. AUTO ADJUSTING MODE (2)

1. Drive straight ahead at 60 km/h (37 MPH) or more for more than 15 seconds.

CAUTION:

- **Drive on a straight flat road.**
- **Keep the steering wheel, so the vehicle stays in a straight line.**

NOTE:

When the vehicle pulls to one side slightly, the driving at between 30 km/h (19 MPH) and 40 km/h (25 MPH) may not dissolve the symptom.

2. Stop the vehicle.
3. Repeat the driving and stopping 5 times.

>> GO TO 5.

5. SYMPTOM CONFIRMATION

Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom corrected?

YES >> INSPECTION END

NO >> GO TO 6.

THE VEHICLE PULLS TO ONE SIDE

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

6. CHECK SUSPENSION AND STEERING PARTS INSTALLATION CONDITION

Check suspension and steering parts installation condition.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Install suspension and steering parts properly. Then perform the toe-in adjustment. Refer to [ST-83, "ALIGNMENT TESTER : Inspection and Adjustment"](#).

7. TOE-IN ADJUSTMENT

Adjust toe-in. Refer to [ST-83, "ALIGNMENT TESTER : Inspection and Adjustment"](#).

>> GO TO 8.

8. FINAL CHECK

Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom corrected?

YES >> INSPECTION END

NO >> GO TO 7.

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POWER STEERING WARNING LAMP DOES NOT TURN ON

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

POWER STEERING WARNING LAMP DOES NOT TURN ON

Description

INFOID:000000011287052

Power steering warning lamp does not illuminate when the ignition switch is turned ON (lamp check).

Diagnosis Procedure

INFOID:000000011287053

1. CHECK THE POWER STEERING WARNING LAMP

Perform trouble diagnosis for power steering warning lamp system. Refer to [STC-402, "Diagnosis Procedure"](#).

Is the check result normal?

- YES >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).
- NO >> Repair or replace the malfunctioning parts.

POWER STEERING WARNING LAMP DOES NOT TURN OFF

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

POWER STEERING WARNING LAMP DOES NOT TURN OFF

Description

INFOID:0000000011287054

Power steering warning lamp does not turn OFF several seconds after the engine is started.

Diagnosis Procedure

INFOID:0000000011287055

1. PERFORM SELF-DIAGNOSIS

With CONSULT

1. Start the engine.
2. Perform "EPS/DAST 3", "DAST 1" and "DAST 2" self-diagnosis.

Is any DTC displayed?

- YES >> Check the DTC.
- EPS/DAST 3: Refer to [STC-79, "DTC Index"](#).
 - DAST 1: Refer to [STC-92, "DTC Index"](#).
 - DAST 2: Refer to [STC-105, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK THE POWER STEERING WARNING LAMP

Perform trouble diagnosis for power steering warning lamp system. Refer to [STC-402, "Diagnosis Procedure"](#).

Is the check result normal?

- YES >> GO TO 3.
NO >> Repair or replace the malfunctioning parts.

3. CHECK THE DIRECT ADAPTIVE STEERING POWER AND GROUND CIRCUIT

Perform trouble diagnosis for the direct adaptive steering power and ground circuit. Refer to [STC-397, "Diagnosis Procedure"](#).

Is the check result normal?

- YES >> Check the intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).
NO >> Repair or replace the malfunctioning parts.

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SYSTEM IS NOT DISPLAYED ON CONSULT

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

SYSTEM IS NOT DISPLAYED ON CONSULT

Description

INFOID:000000011287056

“DAST 1”, “DAST 2” or “EPS/DAST 3” is not displayed on CONSULT.

Self-diagnostic result or System condition

Detected DTC or system condition			Possible cause	Reference
DAST 1	DAST 2	EPS/DAST 3		
System is not displayed on CONSULT	System is not displayed on CONSULT	System is not displayed on CONSULT	<ul style="list-style-type: none"> Battery power supply circuit Ignition power supply circuit Power supply circuit for steering force control module Steering force control module harness connector 	TYPE 1: Refer to STC-410 .
System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C2-00	C13BE-00, C13C0-00 or C13C2-00	<ul style="list-style-type: none"> FlexRay communication line Steering angle main control module 	TYPE 2: Refer to STC-412 .
System is not displayed on CONSULT	System is not displayed on CONSULT	C13C1-00 and C13C4-00	<ul style="list-style-type: none"> FlexRay communication line Steering force control module Steering angle main control module Steering angle sub control module 	TYPE 3: Refer to STC-412 .
C13C0-00, C13C2-00 or System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C0-00 or C13C3-00	<ul style="list-style-type: none"> FlexRay communication line Steering angle sub control module 	TYPE 4: Refer to STC-413 .
System is not displayed on CONSULT	C13C0-00 and C13C2-00	C13C0-00 and C13C2-00	<ul style="list-style-type: none"> Power supply circuit for steering angle main control module Steering angle main control module harness connector Ignition power supply circuit (between steering angle main control module and steering angle sub control module) 	TYPE 5: Refer to STC-414 .
System is not displayed on CONSULT	System is not displayed on CONSULT	C13C0-00, C13C2-00 and C13C3-00	<ul style="list-style-type: none"> Ignition power supply circuit (between steering force control module and steering angle sub control module) Steering force control module Steering angle sub control module 	TYPE 6: Refer to STC-415 .
C13C0-00 and C13C2-00	System is not displayed on CONSULT	C13C0-00 and C13C3-00	<ul style="list-style-type: none"> Steering angle sub control module harness connector 	TYPE 7: Refer to STC-416 .
System is not displayed on CONSULT	System is not displayed on CONSULT	C13BE-00, C13C1-00 or C13C4-00	<ul style="list-style-type: none"> FlexRay communication line Steering force control module 	TYPE 8: Refer to STC-416 .

TYPE 1

TYPE 1 : Diagnosis Procedure

INFOID:000000011287057

1. CHECK STEERING FORCE CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	33	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.

SYSTEM IS NOT DISPLAYED ON CONSULT

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

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

2.CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M72	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK STEERING FORCE CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 60A fusible link (#G).
2. Check the harness for open or short between steering force control module harness connector No.34 terminal and the 60A fusible link (#G).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4.CHECK INTERNAL CIRCUIT IN STEERING FORCE CONTROL MODULE

Check the continuity between steering force control module connector terminals.

Steering force control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace steering force control module. Refer to [STC-418, "Removal and Installation"](#).

5.CHECK IGNITION POWER SUPPLY FOR STEERING FORCE CONTROL MODULE

1. Check the voltage between steering force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	0 V

2. Turn the ignition switch ON.
3. Check the voltage between force control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

NO >> GO TO 6.

6.CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#12).
3. Disconnect fuse block (J/B) harness connector.
4. Check the continuity between steering force control module connector and fuse block (J/B).

SYSTEM IS NOT DISPLAYED ON CONSULT

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M71	25	M133	20C	Existed

5. Check the continuity between steering force control module connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	25	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

TYPE 2

TYPE 2 : Diagnosis Procedure

INFOID:000000011287058

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module. Refer to [STC-419, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

TYPE 3

TYPE 3 : Diagnosis Procedure

INFOID:000000011287059

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	19	E29	19	Existed
	20		20	

SYSTEM IS NOT DISPLAYED ON CONSULT

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle main control module, steering angle sub control module and steering force control module. Refer to [STC-419. "Removal and Installation"](#), [STC-420. "Removal and Installation"](#) and [STC-418. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

TYPE 4

TYPE 4 : Diagnosis Procedure

INFOID:0000000011287060

1.CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

Steering angle sub control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2.CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering angle sub control module. Refer to [STC-420. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

TYPE 5

SYSTEM IS NOT DISPLAYED ON CONSULT

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

TYPE 5 : Diagnosis Procedure

INFOID:000000011287061

1. CHECK STEERING ANGLE MAIN CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle main control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	33	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E27	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK STEERING ANGLE MAIN CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#J).
2. Check the harness for open or short between steering angle main control module harness connector No.34 terminal and the 100A fusible link (#J).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

4. CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE MAIN CONTROL MODULE

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

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	0 V

4. Turn the ignition switch ON.
5. Check the voltage between steering angle control module harness connector and ground.

Steering angle main control module		—	Continuity
Connector	Terminal		
E26	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

NO >> GO TO 5.

5. CHECK IGNITION POWER SUPPLY CIRCUIT

SYSTEM IS NOT DISPLAYED ON CONSULT

[DIRECT ADAPTIVE STEERING]

< SYMPTOM DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between steering angle main control module harness connector and steering angle sub control module harness connector.

Steering angle main control module		Steering angle sub control module		Continuity
Connector	Terminal	Connector	Terminal	
E26	25	E29	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module and steering angle sub control module. Refer to [STC-397, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

TYPE 6

TYPE 6 : Diagnosis Procedure

INFOID:0000000011287062

1.CHECK INTERNAL CIRCUIT IN STEERING ANGLE SUB CONTROL MODULE

Check the continuity between steering angle sub control module connector terminals.

Steering angle sub control module		Continuity
Terminal		
25	27	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace steering angle sub control module. Refer to [STC-420, "Removal and Installation"](#).

2.CHECK IGNITION POWER SUPPLY FOR STEERING ANGLE SUB CONTROL MODULE

1. Check the voltage between steering angle sub control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	0 V

2. Turn the ignition switch ON.

3. Check the voltage between steering angle control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E29	25	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-42, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module and steering angle sub control module. Refer to [STC-418, "Removal and Installation"](#), [STC-420, "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

4.CHECK IGNITION POWER SUPPLY CIRCUIT (2)

1. Turn the ignition switch OFF.
2. Disconnect steering force control module harness connector.
3. Check the continuity between steering angle sub control module harness connector and steering force control module harness connector.

SYSTEM IS NOT DISPLAYED ON CONSULT

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering angle sub control module		Steering force control module		Continuity
Connector	Terminal	Connector	Terminal	
E29	25	M71	27	Existed

Is the inspection result normal?

YES >> Check the ignition power supply circuit for steering force control module. Refer to [STC-230, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

TYPE 7

TYPE 7 : Diagnosis Procedure

INFOID:000000011287063

1. CHECK STEERING ANGLE SUB CONTROL MODULE GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect steering angle sub control module harness connector.
3. Check the continuity between control module harness connector and ground.

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	33	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (1)

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

Steering angle sub control module		—	Continuity
Connector	Terminal		
E30	34	Ground	10.5 – 16.0 V

Is the inspection result normal?

YES >> Perform intermittent incident. Refer to [GI-42, "Intermittent Incident"](#).

NO >> GO TO 3.

3. CHECK STEERING ANGLE SUB CONTROL MODULE POWER SUPPLY CIRCUIT (2)

1. Check the 100A fusible link (#H).
2. Check the harness for open or short between steering angle sub control module harness connector No.34 terminal and the 100A fusible link (#H).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for battery power supply circuit. Refer to [PG-13, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).

NO >> Repair or replace error-detected parts.

TYPE 8

TYPE 8 : Diagnosis Procedure

INFOID:000000011287064

1. CHECK FLEXRAY COMMUNICATION CIRCUIT

1. Disconnect each control module harness connector.
2. Check the continuity between each control module harness connector.

SYSTEM IS NOT DISPLAYED ON CONSULT

< SYMPTOM DIAGNOSIS >

[DIRECT ADAPTIVE STEERING]

Steering force control module		Steering angle main control module		Continuity
Connector	Terminal	Connector	Terminal	
M71	19	E26	19	Existed
	20		20	

3. Check the continuity between control module harness connector and ground.

Steering force control module		—	Continuity
Connector	Terminal		
M71	19	Ground	Not existed
	20		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected part.

2. CHECK INTERMITTENT INCIDENT

Refer to [GI-42. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace steering force control module. Refer to [STC-418. "Removal and Installation"](#).

NO >> Repair or replace error-detected part.

A
B
C
D
E
F
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P

STC

STEERING FORCE CONTROL MODULE

< REMOVAL AND INSTALLATION >

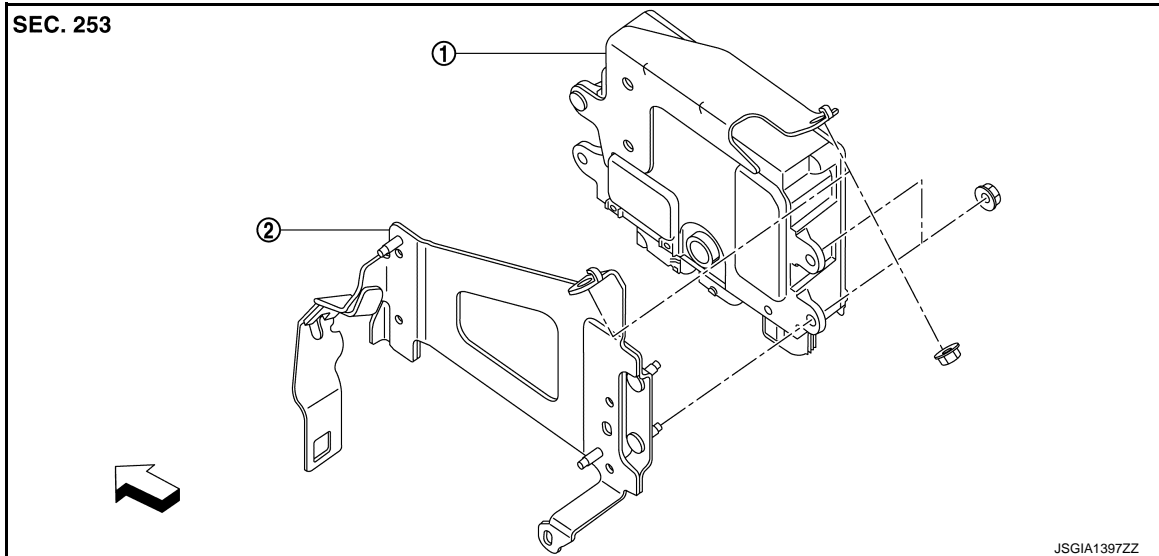
[DIRECT ADAPTIVE STEERING]

REMOVAL AND INSTALLATION

STEERING FORCE CONTROL MODULE

Exploded View

INFOID:000000011287065



- ① Steering force control module ② Bracket

↖: Vehicle front

Removal and Installation

INFOID:000000011287066

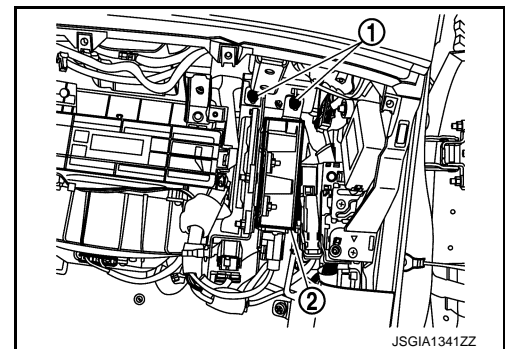
REMOVAL

1. Remove the glove box. Refer to [IP-13, "Removal and Installation"](#).
2. Remove the instrument lower panel. Refer to [IP-13, "Removal and Installation"](#).
3. Disconnect steering force control module harness connectors.
4. Disconnect ECM harness connectors.
5. Remove the nuts ① of steering force control module ② mounting bracket.
6. Remove the steering force control module.

CAUTION:

When replacing control module, replace the following control modules as a set.

- Steering force control module
- Steering angle main control module
- Steering angle sub control module



INSTALLATION

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

CAUTION:

Perform additional service when replacing steering force control module. Refer to [STC-122, "Special Repair Requirement"](#).

STEERING ANGLE MAIN CONTROL MODULE

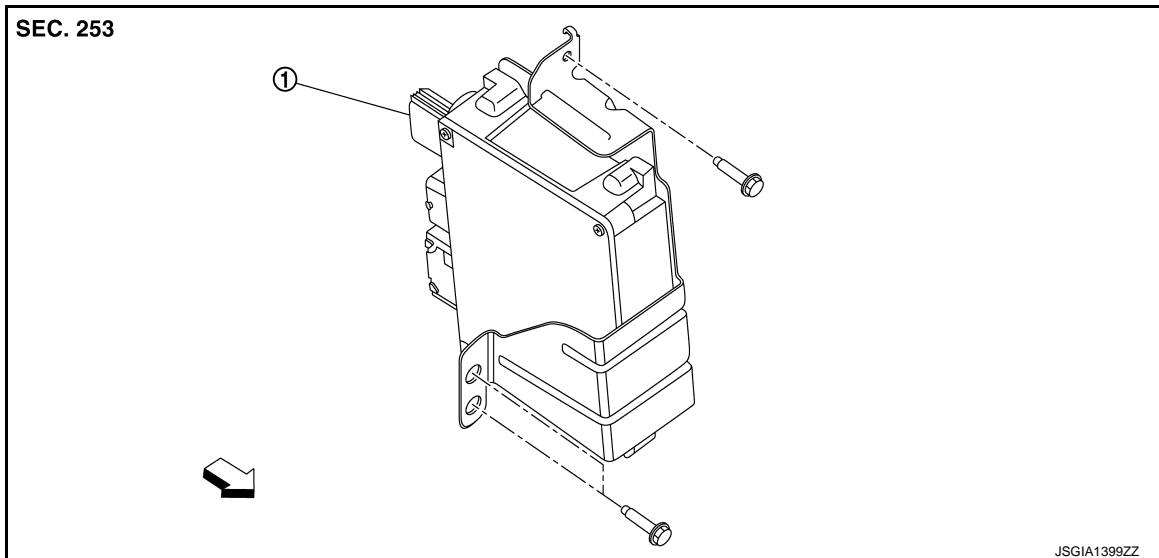
< REMOVAL AND INSTALLATION >

[DIRECT ADAPTIVE STEERING]

STEERING ANGLE MAIN CONTROL MODULE

Exploded View

INFOID:000000011287067



① Steering angle main control module

⇐: Vehicle front

Removal and Installation

INFOID:000000011287068

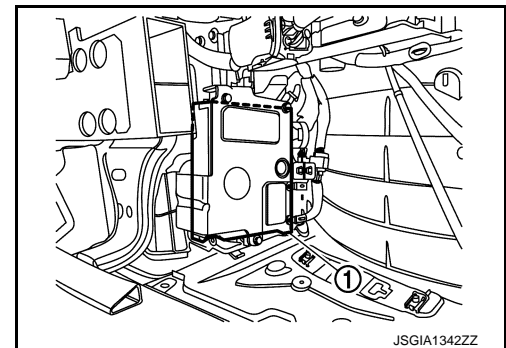
REMOVAL

1. Remove front bumper. Refer to [EXT-15. "Removal and Installation"](#)
2. Remove washer tank. Refer to [WW-61. "WASHER TANK : Removal and Installation"](#).
3. Disconnect steering angle main control module connectors.
4. Remove the bolts of steering angle main control module ①.
5. Remove the steering angle main control module.

CAUTION:

When replacing control module, replace the following control modules as a set.

- Steering force control module
- Steering angle main control module
- Steering angle sub control module



INSTALLATION

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

CAUTION:

Perform additional service when replacing steering angle main control module. Refer to [STC-122. "Special Repair Requirement"](#).

STEERING ANGLE SUB CONTROL MODULE

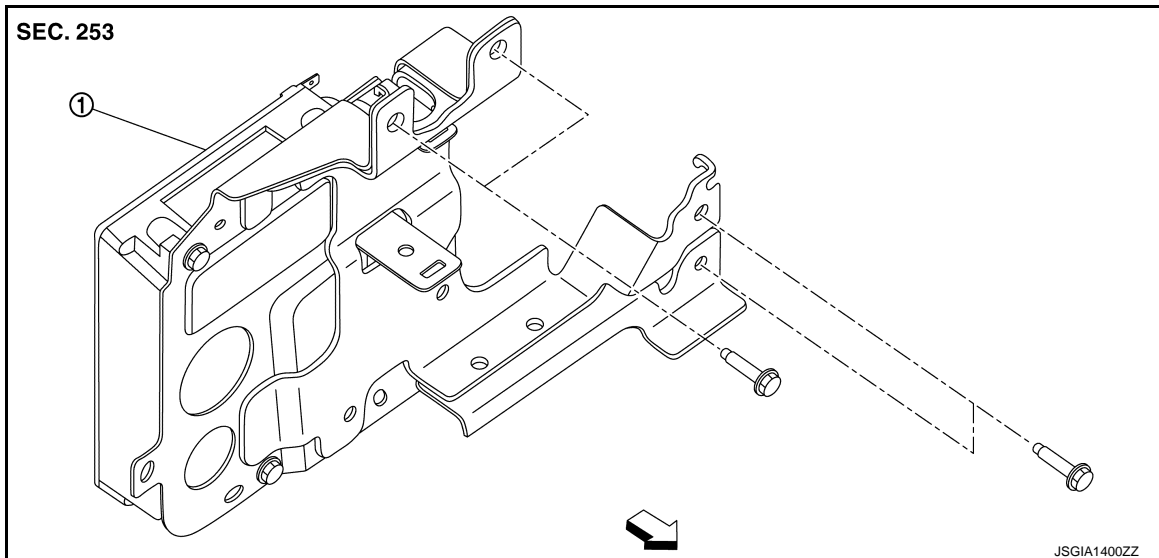
< REMOVAL AND INSTALLATION >

[DIRECT ADAPTIVE STEERING]

STEERING ANGLE SUB CONTROL MODULE

Exploded View

INFOID:000000011287069



① Steering angle sub control module

⇐: Vehicle front

Removal and Installation

INFOID:000000011287070

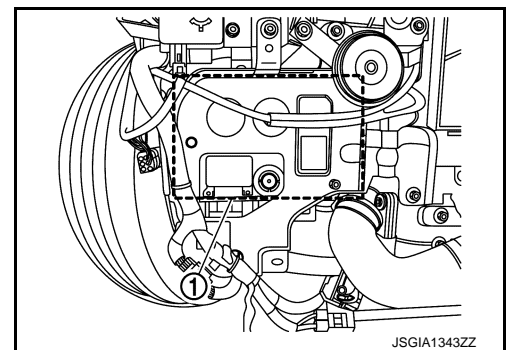
REMOVAL

1. Remove front bumper. Refer to [EXT-15, "Removal and Installation"](#)
2. Disconnect steering angle sub control module connectors.
3. Remove the bolts of steering angle sub control module ①.
4. Remove the steering angle sub control module.

CAUTION:

When replacing control module, replace the following control modules as a set.

- Steering force control module
- Steering angle main control module
- Steering angle sub control module



INSTALLATION

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

CAUTION:

Perform additional service when replacing steering angle sub control module. Refer to [STC-122, "Special Repair Requirement"](#).