SECTION STC
STEERING CONTROL SYSTEM

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000006046074

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:

- **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 the “SRS AIR BAG”.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:0000000006046075

NOTE:

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

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 push-button ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

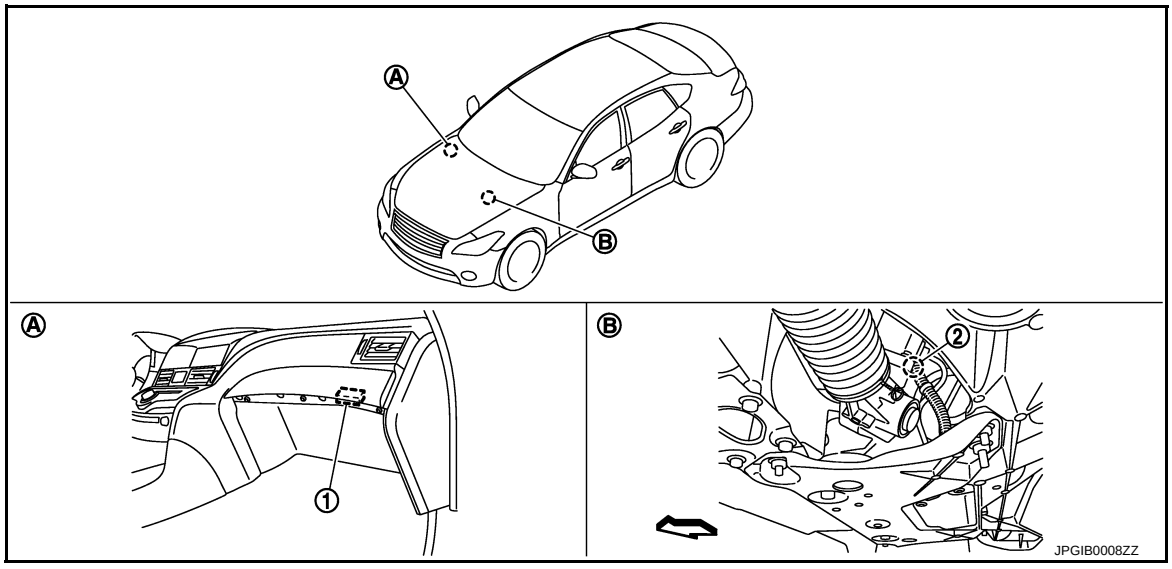
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT-III.

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000006044888



1. Power steering control unit
2. Power steering solenoid valve
A. Glove box assembly removed
B. Steering gear assembly

⇦: Vehicle front

Component Description

INFOID:0000000006044889

Component parts	Reference/Function
Power steering control unit	STC-8, "Power Steering Control Unit"
Power steering solenoid valve	STC-8, "Power Steering Solenoid Valve"
Combination meter	MWI-9, "METER SYSTEM : System Description"
ECM	EC-44, "ENGINE CONTROL SYSTEM : System Description" (VQ37VHR) EC-569, "ENGINE CONTROL SYSTEM : System Description" (VK56VD)

Power Steering Control Unit

INFOID:0000000006044890

- 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 EPS system if any vehicle speed signal error is detected.)

Power Steering Solenoid Valve

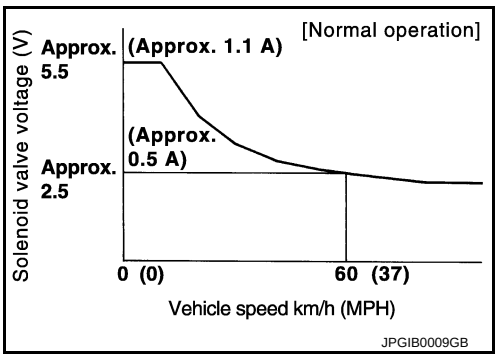
INFOID:0000000006044891

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

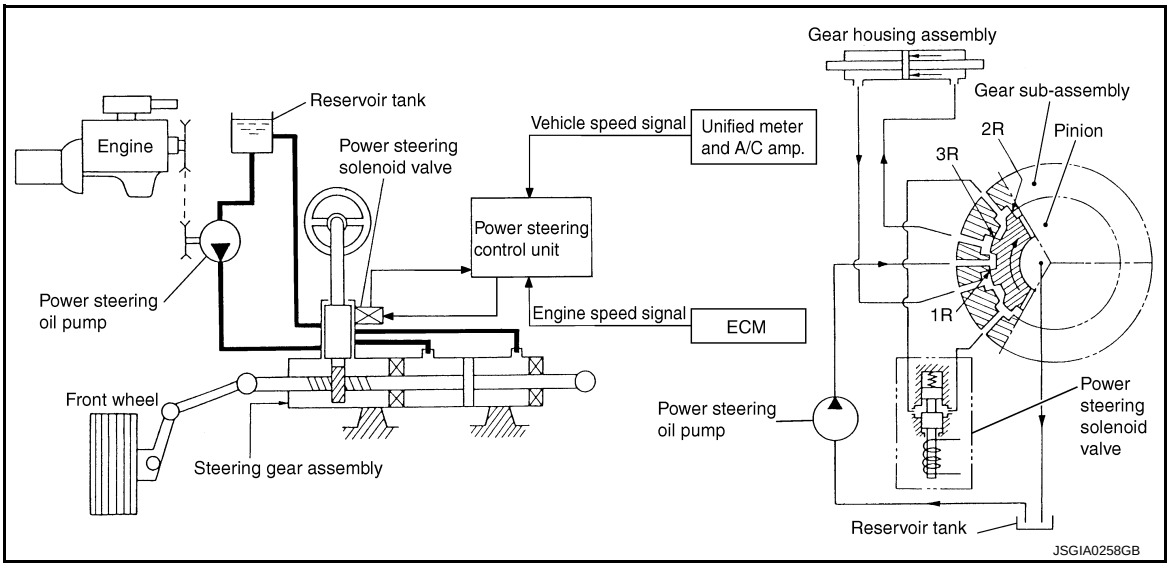
SYSTEM
EPS SYSTEM
EPS SYSTEM : System Description

INFOID:0000000006044892

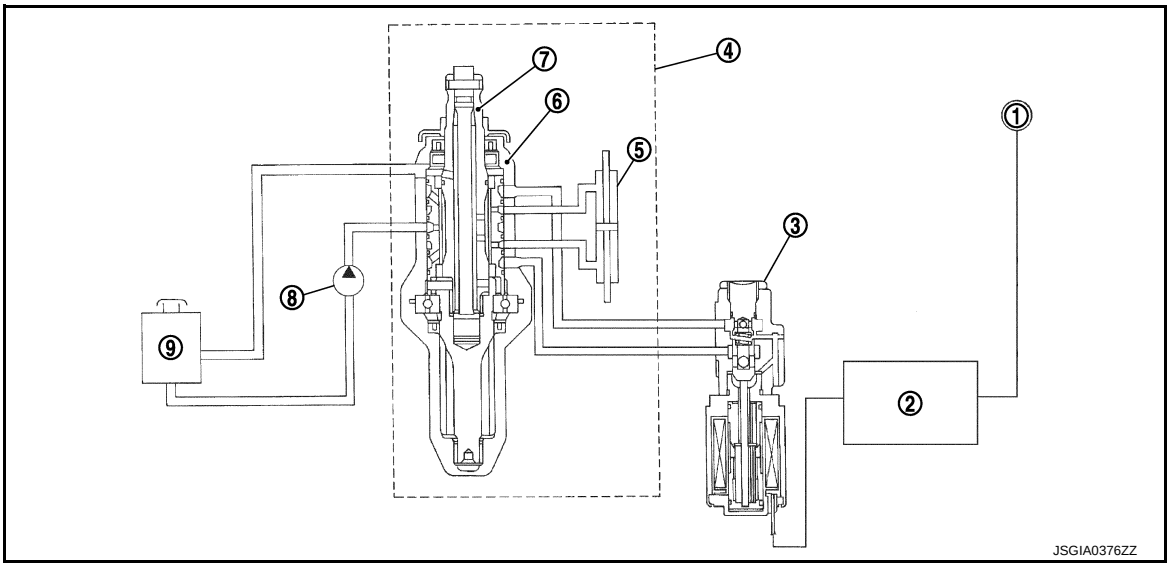
- EPS system controls the power steering solenoid valve through the power steering control unit.
- The valve driving voltage to control the power steering solenoid valve varies according to the vehicle speed.



CONTROL DIAGRAM



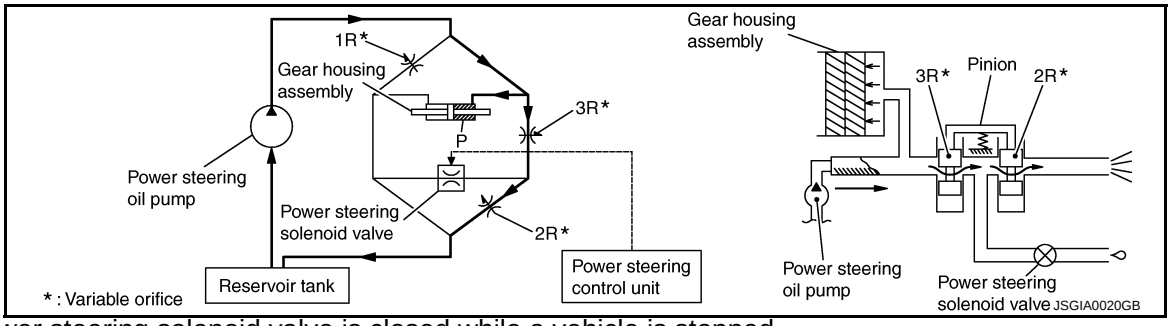
CROSS-SECTIONAL VIEW



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

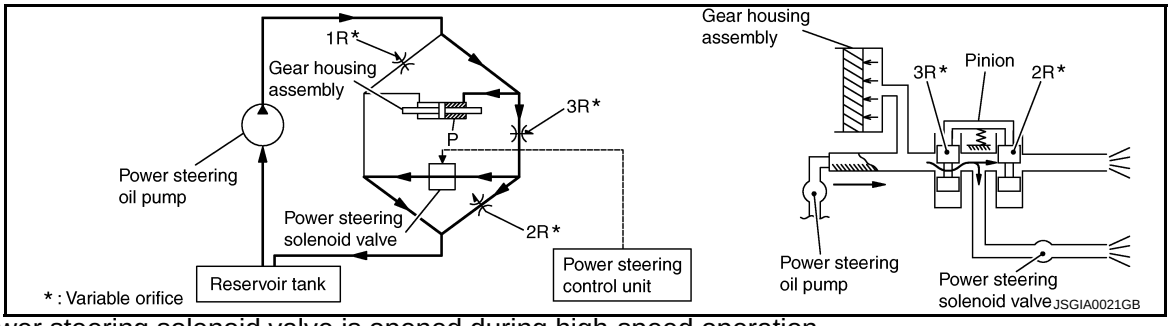
OPERATION PRINCIPLE

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

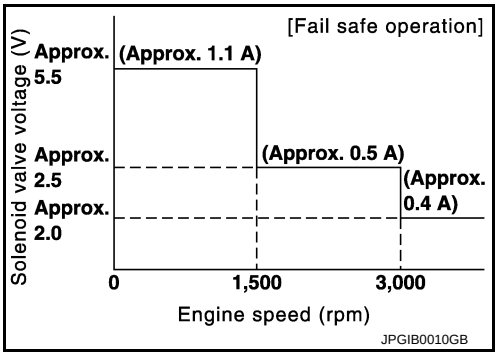


1. Power steering solenoid valve is opened during high-speed operation.
2. Pinion “1R”, “2R” and “3R” are closed depending on steering torque of steering wheel.
3. Oil pressure “2R” does not occur because the power steering solenoid valve is on full throttle.
4. Oil pressure “P” in the gear housing assembly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

EPS SYSTEM : Fail-safe

INFOID:0000000006046115

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

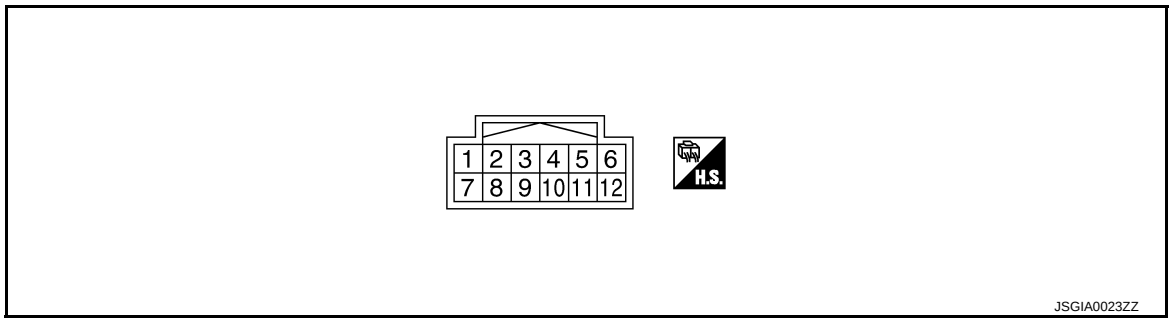
ECU DIAGNOSIS INFORMATION

EPS CONTROL UNIT

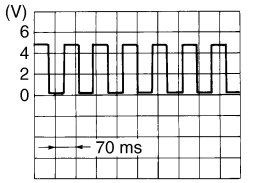
Reference Value

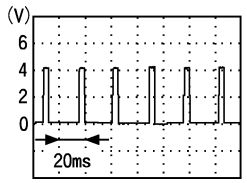
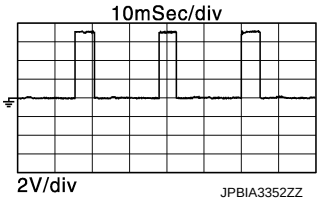
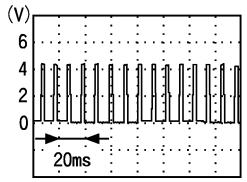
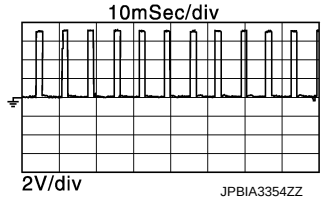
INFOID:0000000006044894

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 (G)	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 (GR)	Ground	Vehicle speed signal	Input	Vehicle speed: 40 km/h (25 MPH) **CAUTION:** **Check air pressure of tire under standard condition.**	 SEIA0775E

Terminal No.		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
10 (V)	Ground	Engine speed signal	Input	Engine speed: At idle (Warm-up condition)	VQ37VHR  PBIA3654J VK56VD  JPBIA3352ZZ
				Engine speed: Approx. 2,000 rpm (Warm-up condition)	VQ37VHR  PBIA3655J VK56VD  JPBIA3354ZZ

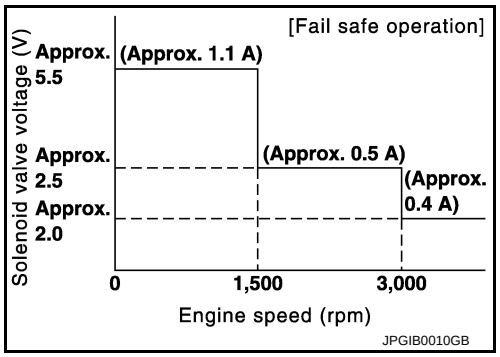
CAUTION:

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

Fail-safe

INFOID:0000000006044895

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



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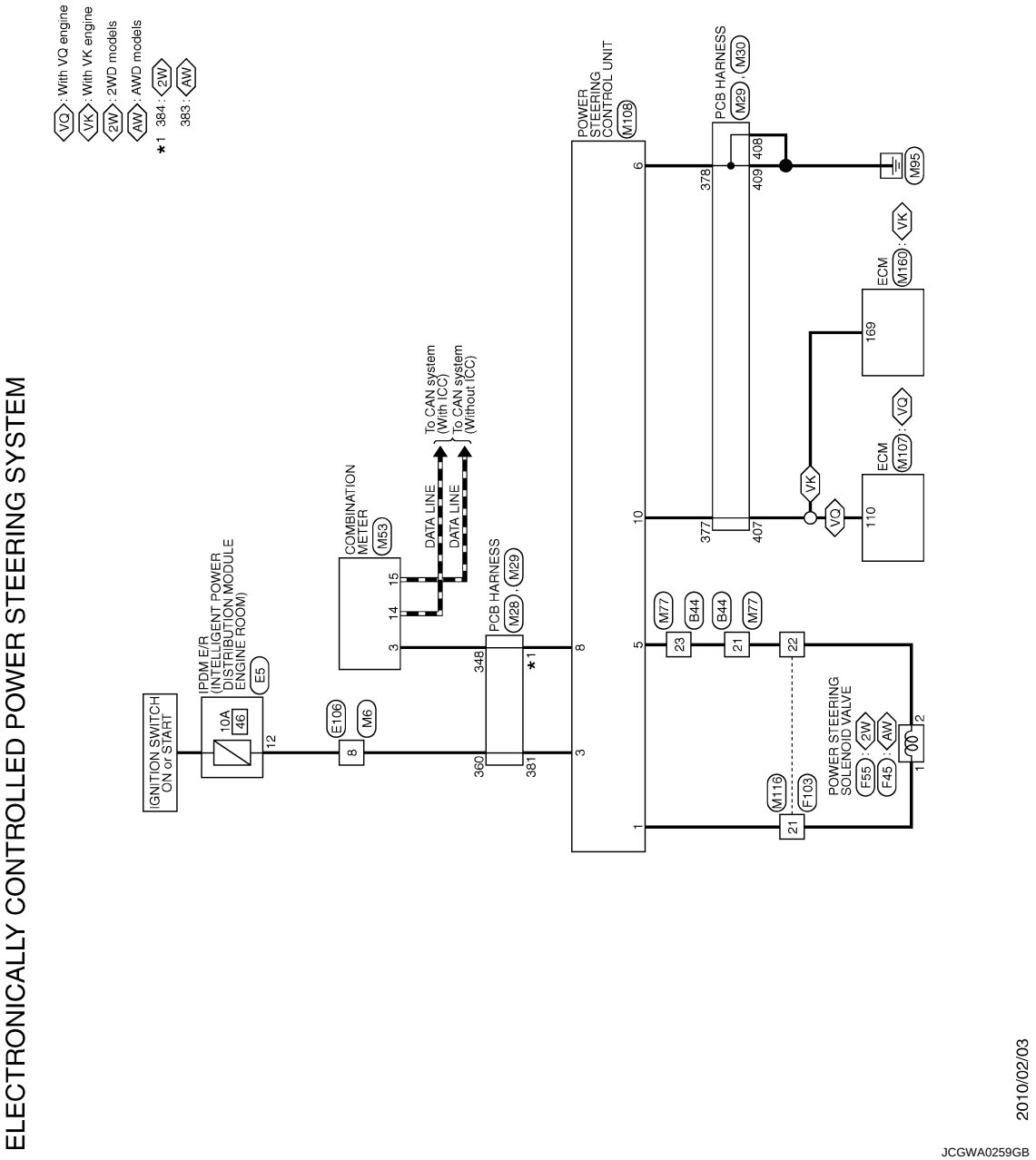
Error area and root cause	Cancel condition
Engine speed is 1,500 rpm or more and there is no vehicle speed signal input for over 10 seconds during vehicle travel.	• When a vehicle speed signal of 2 km/h (1.2 MPH) or more is inputted. • Key switch is turned OFF to ON.
Vehicle speed signal has abruptly 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

INFOID:0000000006044896



ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

Connector No.	B44
Connector Name	WIRE TO WIRE
Connector Type	TH40FW-NH

H.S.

20	19	18	17	16	15	14	13	12	11
40	39	38	37	36	35	34	33	32	31

10	9	8	7	6	5	4	3	2	1
30	29	28	27	26	25	24	23	22	21

Terminal No.	Color of Wire	Signal Name [Specification]
9	R	–
10	G	–
11	R	–
12	G	–
13	O	–
14	V	–
15	LG	–
16	L	–
17	BR	–
18	Y	–
19	SB	–
20	P	–
21	B	–
22	B	–
23	B	–
29	SHIELD	–
30	P	– [With BOSE system]
30	SB	– [Without BOSE system]
31	L	– [With BOSE system]
31	O	– [Without BOSE system]
32	SHIELD	–
33	Y	– [With BOSE system]
33	W	– [Without BOSE system]
34	BR	– [With BOSE system]
34	LG	– [Without BOSE system]
35	SHIELD	–
36	L	– [With BOSE system]
36	GR	– [Without BOSE system]
37	R	– [With BOSE system]
37	V	– [Without BOSE system]
38	SHIELD	–
39	B	– [With BOSE system]
39	L	– [Without BOSE system]
40	W	– [With BOSE system]
40	Y	– [Without BOSE system]

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

H.S.

9	10	11	12	13	14		37	38
3	4	5	6	7	8		35	36

Terminal No.	Color of Wire	Signal Name [Specification]
4	W	–
5	P	–
6	R	–
7	Y	–
8	L	–
10	V	–
11	B	–
12	G	–
13	GR	–
16	V	–
18	Y	–
22	BR	–
23	SB	–
24	O	–
25	LG	–
30	BR	–
31	W	–
32	L	–
34	P	–
36	GR	–

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	P	–
2	W	–
3	SB	–
4	LG	–
5	O	–
7	GR	–
8	G	–
9	Y	–
10	BR	–
11	SB	–
12	V	–
13	GR	–
14	GR	–
15	V	–
16	Y	–
17	GR	–
18	V	–
20	BR	–
21	P	–
22	L	–
23	P	–
27	SHIELD	–
28	L/O	–
29	W/L	–
31	BR	–
32	G	–
33	O	–
34	Y	–
40	BR	–
41	BR	–
42	L	–
43	P	–
44	W	–
45	L	–
46	GR	–
47	V	–
48	G	–
49	O	–
50	LG	–
60	W	–
61	G	–
62	Y	–
63	BR	–
64	B	–
65	Y	–
66	R	–
67	SB	–
77	O	–
78	SB	–
80	G	–
81	R	–
82	SB	–
83	GR	–
84	Y	–
85	Y	–
86	L	–
87	V	–
88	BR	–
89	LG	–
90	W	–
91	W	–
92	P	–
93	LG	–
94	BR	–
95	W	–
96	R	–
97	R	–
98	Y	–
99	V	–
100	V	–

Connector No.	F45
Connector Name	POWER STEERING SOLENOID VALVE
Connector Type	RS02FBR-DGY

H.S.

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

Connector No.	F55
Connector Name	POWER STEERING SOLENOID VALVE
Connector Type	RH02FB

H.S.

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

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ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

Connector No.	F103
Connector Name	WIRE TO WIRE
Connector Type	TK36FW-NS10

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
2	L	–
3	G	–
4	B	– [With VK engine]
4	R	– [With VQ engine]
5	GR	– [With VK engine]
5	B	– [With VQ engine]
7	LG	–
8	Y	–
9	W	– [With VK engine]
9	SB	– [With VQ engine]
10	BR	– [With VK engine]
10	V	– [With VQ engine]
11	L	–
12	P	–
13	V	–
14	SB	–
15	R	–
16	W	–
17	GR	–
18	LG	–
21	LG	–
22	B	–
23	G	–
24	BR	–
25	O	–

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	–
2	W	–
3	SB	–
4	LG	–
5	W	–
7	BG	–
8	G	–
9	Y	–
10	W	–
11	R	–
12	V	–
13	LG	–
14	L	–
15	V	–
16	B	–
17	GR	–
18	V	–
20	SB	–
21	BR	–
22	L	–
23	P	–
27	SHIELD	–
28	V	–
29	SB	–
31	BG	–
32	P	–
33	R	–
34	BG	–
40	BR	–
41	BR	–
42	L	–
43	P	–
44	BR	–
45	Y	–
46	BG	–
47	V	–
48	G	–
49	BG	–
50	W	–
60	GR	–
61	B	–
62	LG	–
63	BR	–
64	L	–
65	R	–
66	P	–
67	L	–
77	B	–
78	V	–
80	G	–
81	L	–
82	B	–
83	BG	–
84	SB	–
85	Y	–
86	L	–
87	V	–
88	V	–
89	LG	–
90	BG	–
91	W	–
92	BG	–
93	G	–
94	Y	–
95	W	–
96	R	–
97	SB	–
98	R	–
99	W	–
100	L	–
326	L	–
327	P	–
328	P	–
330	B	–
331	V	–
332	V	–
335	B	–
337	W	–
338	W	–
343	L	–
344	B	–
345	Y	–
346	L	–
347	P	–
348	GR	–
349	V	–
350	LG	–
351	P	–
352	R	–
353	P	–
358	W	–
359	W	–
360	G	–

Connector No.	M28
Connector Name	POB HARNESS
Connector Type	TH40FW-NH

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
321	V	–
322	V	–
324	B	–
325	L	–

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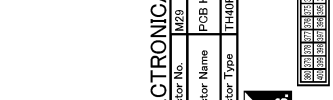
ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

Connector No.	M29
Connector Name	PCB HARNESS
Connector Type	TH40FB-NH

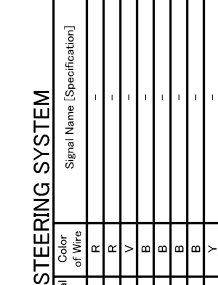
Terminal No.	Color of Wire	Signal Name [Specification]
361	W	–
362	W	–
363	Y	–
366	B	–
367	B	–
368	G	–
373	BR	–
374	BG	–
375	BG	–
376	V	–
377	V	–
378	B	–
379	R	–
380	R	–
381	G	–
382	V	–
383	GR	–
384	GR	–
395	P	–
396	L	–
397	R	–
398	L	–
400	V	–

Connector No.	M30
Connector Name	PCB HARNESS
Connector Type	TH40FW-NH



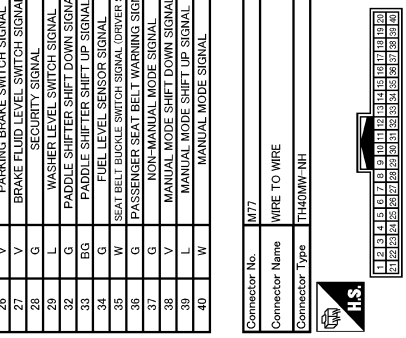
Terminal No.	Color of Wire	Signal Name [Specification]
1	W	BATTERY POWER SUPPLY
2	BG	IGNITION SIGNAL
3	GR	VEHICLE SPEED SIGNAL (2-PULSE)
4	R	VEHICLE SPEED SIGNAL (8-PULSE)
5	B	ILLUMINATION CONTROL SIGNAL
6	B	METER CONTROL SWITCH GROUND
7	SB	ENTER SWITCH SIGNAL
8	LG	SELECT SWITCH SIGNAL
9	G	ILLUMINATION CONTROL SWITCH SIGNAL (+)
10	GR	ILLUMINATION CONTROL SWITCH SIGNAL (-)
11	L	TRIP RESET SWITCH SIGNAL
12	B	GROUND
14	L	CAN-H
15	P	CAN-L
16	R	AIR BAG SIGNAL
23	B	GROUND
24	B	FUEL LEVEL SENSOR GROUND
25	W	ALTERNATOR SIGNAL
26	V	PARKING BRAKE SWITCH SIGNAL
27	V	BRAKE FLUID LEVEL SWITCH SIGNAL
28	G	SECURITY SIGNAL
29	L	WASHER LEVEL SWITCH SIGNAL
32	G	PADDLE SHIFTER SHIFT DOWN SIGNAL
33	BG	PADDLE SHIFTER SHIFT UP SIGNAL
34	G	FUEL LEVEL SENSOR SIGNAL
35	W	SEAT BELT BUCKLE SWITCH SIGNAL [DRIVER SIDE]
36	G	PASSENGER SEAT BELT WARNING SIGNAL
37	G	NON-MANUAL MODE SIGNAL
38	V	MANUAL MODE SHIFT DOWN SIGNAL
39	L	MANUAL MODE SHIFT UP SIGNAL
40	W	MANUAL MODE SIGNAL

Connector No.	M53
Connector Name	COMBINATION METER
Connector Type	TH40FW-NH



Terminal No.	Color of Wire	Signal Name [Specification]
401	R	–
402	R	–
403	R	–
407	V	–
408	B	–
409	B	–
410	B	–
411	B	–
413	Y	–
414	BR	–
416	LG	–
417	B	–
419	SB	–
420	SHIELD	–
422	V	–
427	P	–
428	V	–
429	P	–
430	LG	–
431	B	–
432	Y	–
435	V	–
436	BG	–
437	B	–
438	P	–
439	L	–

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH40MW-NH



Terminal No.	Color of Wire	Signal Name [Specification]
9	LG	–
10	SB	–
11	LG	–
12	SB	–
13	B	–
14	P	– [With BOSE system]
14	V	– [Without BOSE system]
15	LG	–
16	L	–
17	G	–
18	R	–
19	V	–
20	V	–
21	B	–
22	B	–
23	B	–
29	SHIELD	–
30	Y	– [With BOSE system]
30	V	– [Without BOSE system]
31	BR	– [With BOSE system]
31	P	– [Without BOSE system]
32	SHIELD	–
33	SB	– [With BOSE system]
33	G	– [Without BOSE system]
34	V	– [With BOSE system]
34	GR	– [Without BOSE system]
35	SHIELD	–
36	R	–
37	G	– [With BOSE system]
37	BR	– [Without BOSE system]
38	SHIELD	–
39	P	– [With BOSE system]
39	L	– [Without BOSE system]
40	L	– [With BOSE system]
40	G	– [Without BOSE system]

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ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

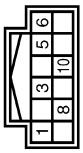
Connector No.	M107
Connector Name	ECM
Connector Type	RH24FGY-RZ8-R-RH-Z

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
97	R	APS1
98	Y	APS2
99	G	AVCC1-APS1
100	W	GNDA-APS1
101	SB	ASCD SW
102	P	FTPRES
103	L	AVCC2-APS2
104	BR	GND-APS2 [With ICC]
105	LG	GND-APS2 [Without ICC]
106	P	PDPRES
107	BG	TF
108	Y	AVCC2 PDPRES/FTPRES
109	BR	GND ASCD SW
110	V	NEUT-H
112	V	TACHO
113	P	GNDA PDPRES/FTPRES
114	L	VEHCAN-L1
117	V	VEHCAN-H1
121	G	K-LINE
122	P	CDCV
123	B	BRAKE
124	B	GND
125	SB	GND
126	BR	VBR
127	B	BNC SW
128	B	GND

Connector No.	M108
Connector Name	POWER STEERING CONTROL UNIT
Connector Type	TH12FW-NH

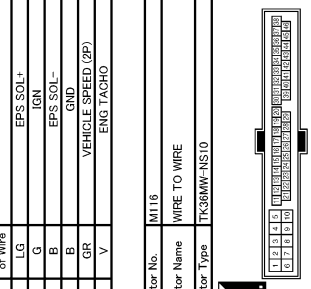
H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	EPS SOL+
3	G	IGN
5	B	EPS SOL-
6	B	GND
8	GR	VEHICLE SPEED (2P)
10	V	ENG TACHO

Connector No.	M116
Connector Name	WIRE TO WIRE
Connector Type	TK36MW-NS10

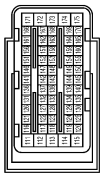
H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
2	SB	-
3	Y	-
4	B	- [With VK engine]
4	SB	- [With VQ engine]
5	B	-
7	W	-
8	Y	-
9	W	- [With VK engine]
9	SB	- [With VQ engine]
10	SB	-
11	L	-
12	P	-
13	V	-
14	R	-
15	Y	-
16	SB	-
17	BR	-
18	LG	-
21	LG	-
22	B	-
23	W	-
24	W	-
25	BG	-

Connector No.	M160
Connector Name	ECM
Connector Type	MAB55FB-MEB10-LH

H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
I11	W	FUEL INJECTOR DRIVER POWER SUPPLY
I12	W	VINJ2A
I14	B	ECM GROUND
I15	B	ECM GROUND
I20	G	EVAP CANISTER VENT CONTROL VALVE
I22	V	VIEL ACTUATOR MOTOR RELAY ARDER SIGNAL (VIEL CONTROL MODULE)
I23	BG	THROTTLE CONTROL MOTOR RELAY
I25	P	FUEL PUMP CONTROL MODULE (FPCM)
I26	Y	ACCELERATOR PEDAL POSITION SENSOR 2
I28	SB	ASCD STEERING SWITCH
I28	SB	ICC STEERING SWITCH
I29	BR	SENSOR GROUND [WITH ICC]
I29	B	SENSOR GROUND [WITHOUT ICC]
I30	Y	SENSOR GROUND
I31	L	SENSOR POWER SUPPLY
I33	BG	SENSOR POWER SUPPLY
I34	P	FUEL TEMPERATURE SENSOR
I36	R	ACCELERATOR PEDAL POSITION SENSOR 1
I37	G	SENSOR POWER SUPPLY
I38	P	BATTERY CURRENT SENSOR
I39	BG	BATTERY TEMPERATURE SENSOR
I40	W	SENSOR GROUND
I41	G	IGNITION SWITCH
I42	GR	FUEL PUMP CONTROL MODULE (FPCM) CHECK
I43	P	FUEL TANK PRESSURE SENSOR
I44	LG	REFRIGERANT PRESSURE SENSOR
I46	L	CAN COMMUNICATION LINE
I47	BR	ASCD BRAKE SWITCH [WITHOUT ICC]
I47	BR	ICC BRAKE SWITCH [WITH ICC]

Terminal No.	Color of Wire	Signal Name [Specification]
150	V	SENSOR GROUND
151	P	CAN COMMUNICATION LINE
156	W	POWER SUPPLY FOR ECM (BACK-UP)
158	P	STOP LAMP SWITCH
161	Y	ECM COMMUNICATION LINE
163	W	ECM RELAY (SELF SHUT-OFF)
166	BG	ECM COMMUNICATION LINE
169	V	ENGINE SPEED SIGNAL OUTPUT
171	SB	POWER SUPPLY FOR ECM
172	SB	POWER SUPPLY FOR ECM
173	R	THROTTLE CONTROL MOTOR POWER SUPPLY
174	B	ECM GROUND
175	B	ECM GROUND

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000006044897

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-31, "Inspection".
2. Check the drive belt tension. Refer to EM-22, "Checking" (VQ37VHR), EM-175, "Checking" (VK56VD).
3. Check the power steering gear for damages, cracks and fluid leakage. Refer to ST-52, "2WD : Inspection and Adjustment" (2WD), ST-62, "AWD : Inspection" (AWD).
4. Check the relief oil pressure. Refer to ST-71, "VQ37VHR : Inspection" (VQ37VHR), ST-77, "VK56VD : Inspection" (VK56VD).

>> 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.

DTC/CIRCUIT DIAGNOSIS

POWER SUPPLY AND GROUND CIRCUIT

Description

INFOID:0000000006044898

Power supply to EPS system.

Diagnosis Procedure

INFOID:0000000006044899

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		
M108	3	Ground	0 V

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		
M108	3	Ground	Battery voltage

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 (#46).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between power steering control unit harness connector and IPDM E/R harness connector.

Power steering control unit		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
M108	3	E5	12	Existed

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

Power steering control unit		—	Continuity
Connector	Terminal		
M108	3	Ground	Not existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply circuit. Refer to PG-84, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace damaged parts.

3.CHECK GROUND CIRCUIT

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		
M108	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.

POWER STEERING SOLENOID VALVE

Component Function Check

INFOID:0000000006044900

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-23, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006044901

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

Is the inspection result normal?

YES >> GO TO 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	
F55 (2WD) F45 (AWD)	1	M108	1	Existed
	2		5	

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

Power steering control unit		—	Continuity
Connector	Terminal		
M108	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-24, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Power steering solenoid valve is malfunctioning. Replace gear-sub assembly. Refer to ST-45, "2WD : Removal and Installation" (2WD), ST-55, "AWD : Removal and Installation" (AWD).

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:0000000006044902

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 gear-sub assembly. Refer to ST-45, "2WD : Removal and Installation" (2WD), ST-55, "AWD : Removal and Installation" (AWD).

ENGINE SPEED SIGNAL CIRCUIT

Diagnosis Procedure

INFOID:0000000006044903

1.PERFORM ECM SELF-DIAGNOSIS

With CONSULT-III

Perform self-diagnosis for “ENGINE”.

Is any error system detected?

YES >> Check the DTC. Refer to EC-102, "DTC Index" (VQ37VHR), EC-639, "DTC Index" (VK56VD).
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	
M108	10	M107*1 M160*2	110*1 169*2	Existed

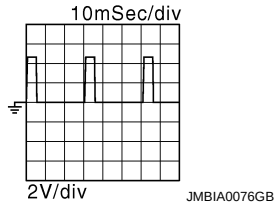
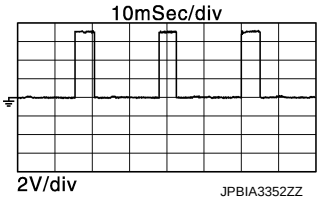
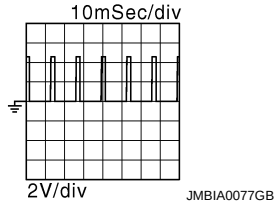
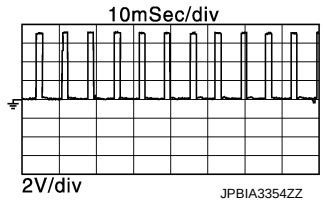
*1: VQ37VHR
*2: VK56VD

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			
M107*1 M160*2	110*1 169*2	Ground	Engine speed: At idle (Warm-up condition)	VQ37VHR 
				VK56VD 
			Engine speed: Approx. 2,000 rpm (Warm-up condition)	VQ37VHR 
				VK56VD 

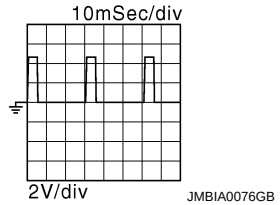
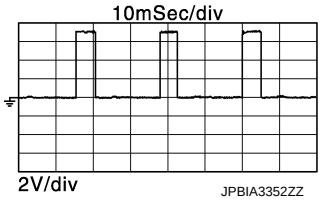
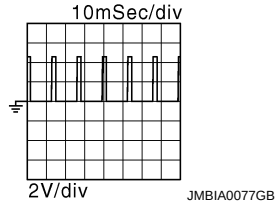
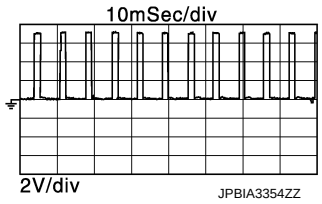
*1: VQ37VHR
*2: VK56VD

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace ECM. Refer to EC-147, "Description" (VQ37VHR), EC-691, "Description" (VK56VD).

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.

Power steering control unit		—	Condition	Value (Approx.)
Connector	Terminal			
M108	10	Ground	Engine speed: At idle (Warm-up condition)	VQ37VHR  JMBIA0076GB VQK56VD  JPBIA3352ZZ
			Engine speed: Approx. 2,000 rpm (Warm-up condition)	VQ37VHR  JMBIA0077GB VK56VD  JPBIA3354ZZ

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace power steering control unit. Refer to STC-31, "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.

VEHICLE SPEED SIGNAL CIRCUIT

Diagnosis Procedure

INFOID:0000000006044904

1.PERFORM COMBINATION METER SELF-DIAGNOSIS

With CONSULT-III

Perform self-diagnosis for “METER/M&A”.

Is any error system detected?

YES >> Check the DTC. Refer to MWI-43, "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	
M108	8	M53	3	Existed

Is the inspection result normal?

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

3.CHECK VEHICLE SPEED SIGNAL (COMBINATION METER)

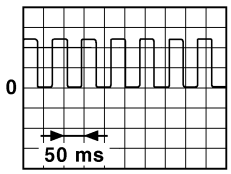
1. Connect combination meter harness connector.
2. Check the combination meter input/output standard values. Refer to MWI-35, "Reference Value".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace combination meter. Refer to MWI-90, "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			
M108	8	Ground	Vehicle speed: 40 km/h (25 MPH) **CAUTION:** **Check the air pressure of tire under standard condition.**	 JSNIA0015GB

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace power steering control unit. Refer to STC-31, "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?

YES >> INSPECTION END

NO >> Repair or replace damaged parts.

SYMPTOM DIAGNOSIS

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

Description

INFOID:0000000006044905

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

Diagnosis Procedure

INFOID:0000000006044906

1. CHECK SYSTEM FOR POWER SUPPLY AND GROUND

Perform trouble diagnosis for power supply and ground. Refer to STC-21, "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-28, "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-25, "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-23, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Perform the symptom diagnosis for the steering system. Refer to ST-29, "NVH Troubleshooting Chart".
NO >> Repair or replace damaged parts.

REMOVAL AND INSTALLATION

POWER STEERING CONTROL UNIT

Removal and Installation

INFOID:0000000006044907

REMOVAL

1. Remove instrument lower panel RH. Refer to IP-12, "Exploded View".
2. Disconnect power steering control unit connector.
3. Remove power steering control unit.

INSTALLATION

Install in the reverse order of removal.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000006046076

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:

- **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 the “SRS AIR BAG”.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:0000000006046077

NOTE:

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

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 push-button ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT-III.

Precautions for Removal and Installation of 4WAS Components

INFOID:0000000006115305

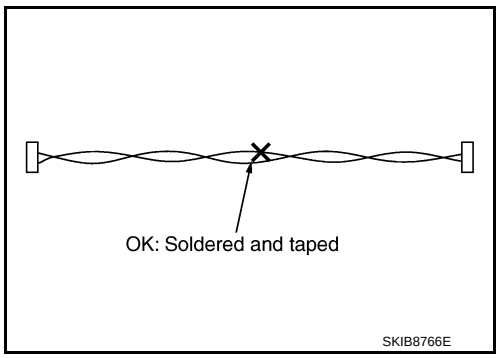
- Set the vehicle to the straight-ahead position when checking 4WAS and removing each component.
- Remove the battery terminal 10 minutes after turning the ignition switch OFF from ON and perform the removal of each component when removing the 4WAS front control unit.
- Perform the neutral position adjustment for the steering angle sensor after the replacement of steering angle sensor. Refer to BRC-68, "Work Procedure".
- Refer to STC-85, "Description" for the replacement of 4WAS front control unit.
- Refer to STC-87, "Description" for the replacement of 4WAS front actuator.
- Refer to STC-86, "Description" for the replacement of 4WAS main control unit.

Precautions for Harness Repair

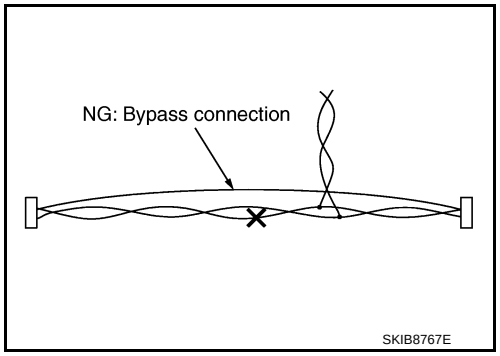
INFOID:0000000006115306

4WAS COMMUNICATION LINE

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



- Bypass connection is never allowed at the repaired area.
  NOTE:
  Bypass connection may cause 4WAS communication error as spliced wires that are separate from the main line or twisted lines lose noise immunity.
- Replace the applicable harness as an assembly if error is detected on the shield lines of 4WAS communication line.



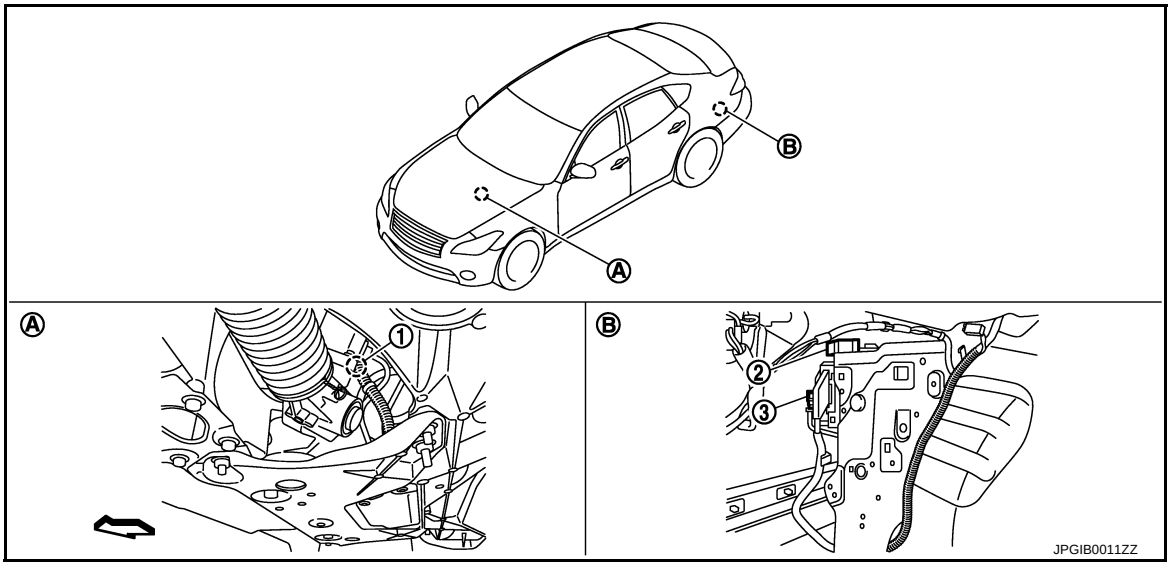
SYSTEM DESCRIPTION

COMPONENT PARTS

EPS SYSTEM

EPS SYSTEM : Component Parts Location

INFOID:0000000006044915



1. Power steering solenoid valve
2. 4WAS rear motor relay
3. 4WAS main control unit
A. Steering gear assembly
B. Inside the trunk side finisher (left)

⇦:Vehicle front

EPS SYSTEM : Component Description

INFOID:0000000006044916

Component parts	Reference/Function
4WAS main control unit	STC-34, "EPS SYSTEM : 4WAS Main Control Unit"
Power steering solenoid valve	STC-34, "EPS SYSTEM : Power Steering Solenoid Valve"
ABS actuator and electric unit (control unit)	BRC-15, "System Description"
ECM	EC-44, "ENGINE CONTROL SYSTEM : System Description" (VQ37VHR) EC-569, "ENGINE CONTROL SYSTEM : System Description" (VK56VD)

EPS SYSTEM : 4WAS Main Control Unit

INFOID:0000000006044917

- The power steering solenoid valve activation voltage is controlled by each sensor signal.
- The power steering solenoid valve activation voltage is controlled by 4WAS main control unit for maintaining the power steering force in the fail-safe mode. (EPS system is controlled by the engine speed signal if the vehicle speed signal error is detected.)

EPS SYSTEM : Power Steering Solenoid Valve

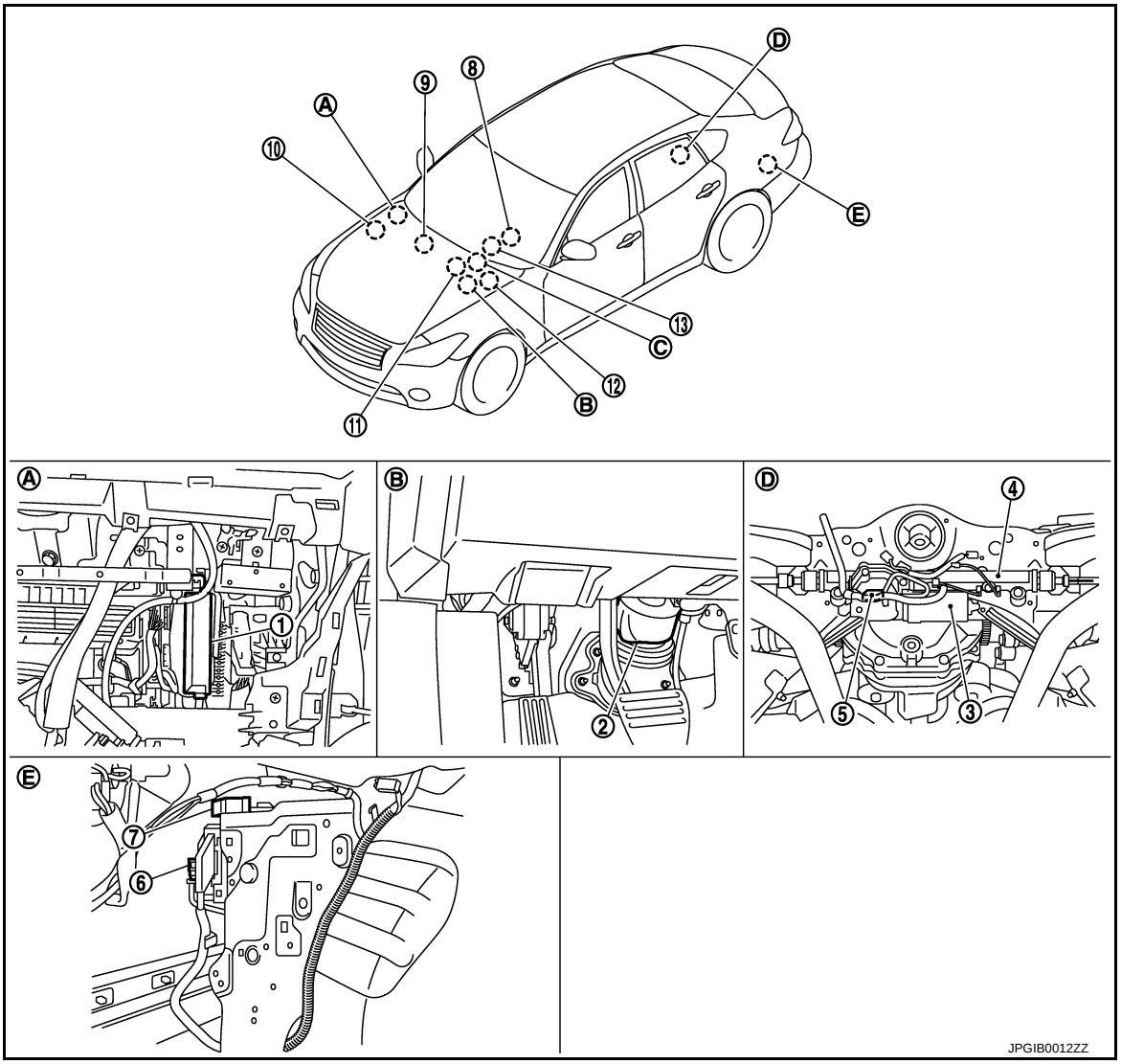
INFOID:0000000006044918

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

4WAS SYSTEM

4WAS SYSTEM : Component Parts Location

INFOID:0000000006044919



1. 4WAS front control unit
2. 4WAS front actuator
3. 4WAS rear motor
4. 4WAS rear actuator
5. Rear wheel steering angle sensor
6. 4WAS main control unit
7. 4WAS rear motor relay
8. Drive mode select switch
   Refer to DMS-3, "Component Parts Location".
9. A/C auto AMP.
   Refer to HAC-7, "AUTOMATIC AIR CONDITIONING SYSTEM (WITH FOREST AIR) : Component Parts Location" [automatic air conditioning system (with forest air)], HAC-10, "AUTOMATIC AIR CONDITIONING SYSTEM (WITHOUT FOREST AIR) : Component Parts Location" [automatic air conditioning system (without forest air)], HAC-14, "FOREST AIR SYSTEM : Component Parts Location" (forest air system).

10. ECM
Refer to EC-24, "ENGINE CONTROL SYSTEM : Component Parts Location" (VQ37VHR), EC-548, "ENGINE CONTROL SYSTEM : Component Parts Location" (VK56VD).
11. Stop lamp switch
Refer to BRC-13, "Stop Lamp Switch".
12. ABS actuator and electric unit (control unit)
Refer to BRC-10, "Component Parts Location".
13. Steering angle sensor
Refer to BRC-13, "Steering Angle Sensor".

A. Inside globe box assembly
B. Inside the instrument driver lower panel
C. 4WAS warning lamp (Inside combination meter)
D. Rear suspension
E. Inside the trunk side finisher (left)

4WAS SYSTEM : Component Description

INFOID:0000000006044920

Component parts		Reference/Function
4WAS front control unit		STC-36, "4WAS SYSTEM : 4WAS Front Control Unit"
4WAS front actuator	4WAS front motor	STC-37, "4WAS SYSTEM : 4WAS Front Actuator"
	4WAS front lock solenoid valve	
	Front wheel steering angle sensor	
4WAS main control unit		STC-37, "4WAS SYSTEM : 4WAS Main Control Unit"
4WAS rear actuator	4WAS rear motor	STC-37, "4WAS SYSTEM : 4WAS Rear Actuator"
	Rear wheel steering angle sensor	
Power steering solenoid valve		STC-34, "EPS SYSTEM : Power Steering Solenoid Valve"
Stop lamp switch		The stop lamp switch condition is detected.
4WAS warning lamp		STC-42, "4WAS SYSTEM : System Description"
ECM		EC-44, "ENGINE CONTROL SYSTEM : System Description" (VQ37VHR) EC-569, "ENGINE CONTROL SYSTEM : System Description" (VK56VD)
ABS actuator and electronic unit (control unit)		BRC-15, "System Description"
A/C auto AMP.		HAC-19, "AUTOMATIC AIR CONDITIONING SYSTEM (WITH FOREST AIR) : System Description" [Automatic air conditioning system (with forest air)] HAC-27, "AUTOMATIC AIR CONDITIONING SYSTEM (WITHOUT FOREST AIR) : System Description" [Automatic air conditioning system (without forest air)] HAC-35, "FOREST AIR SYSTEM : System Description" (Forest air system)
Drive mode select switch		DMS-4, "Drive Mode Select Switch"
Steering angle sensor		BRC-13, "Steering Angle Sensor"

4WAS SYSTEM : 4WAS Front Control Unit

INFOID:0000000006044921

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

4WAS SYSTEM : 4WAS Main Control Unit

INFOID:0000000006044922

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

4WAS SYSTEM : 4WAS Front Actuator

INFOID:0000000006044923

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

4WAS FRONT MOTOR

4WAS front motor controls number of revolutions by a command value from the 4WAS front control unit.

4WAS FRONT LOCK SOLENOID VALVE

- 4WAS front actuator releases the lock when the engine speed signal is “ON”. 4WAS front actuator applies the lock when the engine speed signal is “OFF”.
- Secure the inside of 4WAS front actuator temporarily. (It operates when performing active test with fail-safe function and CONSULT-III.)
- **CAUTION:**
  Never perform other than trouble diagnosis, etc.
- The front steering gear ratio (4WAS front actuator) changes with 4WAS front motor and the gear shaft when releasing the lock structure (4WAS front lock solenoid valve).
  NOTE:
  The lock structure is released when turning 4WAS lock solenoid valve ON.
- The lock structure (holder) absorbs force and applies the lock when applying strong force to 4WAS front actuator.
  CAUTION:
  Replace 4WAS front actuator when the system breaks down due to the excessive external force (rotating direction) applied to 4WAS front actuator.

FRONT WHEEL STEERING ANGLE SENSOR

The front wheel steering angle increased/decreased degree is detected.

4WAS SYSTEM : 4WAS Rear Actuator

INFOID:0000000006044924

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

- The rear wheel steering angle increased/decreased degree is detected.

4WAS REAR MOTOR

4WAS rear motor controls number of revolutions by a command value from the 4WAS main control unit.

REAR WHEEL ANGLE SENSOR

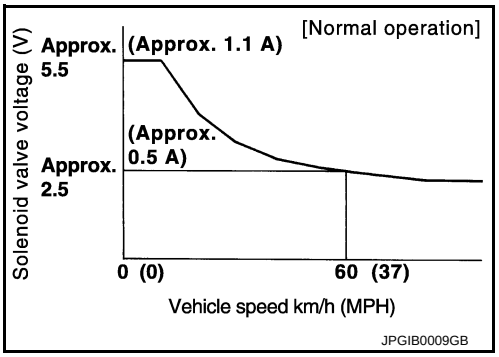
The rear wheel steering angle increased/decreased degree is detected.

SYSTEM
EPS SYSTEM
EPS SYSTEM : System Description

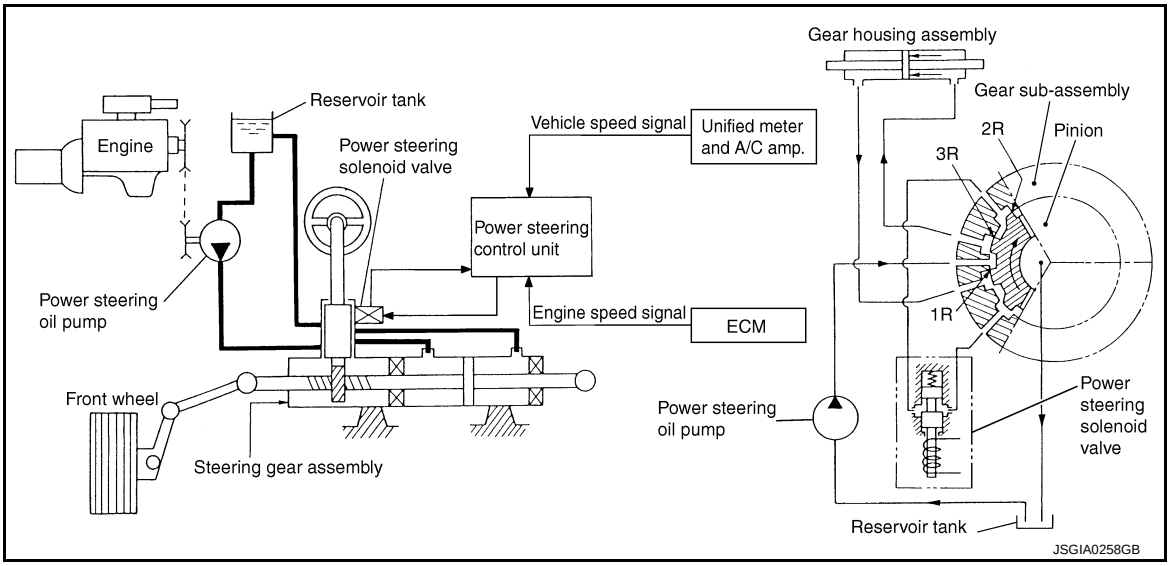
INFOID:0000000006044925

DESCRIPTION

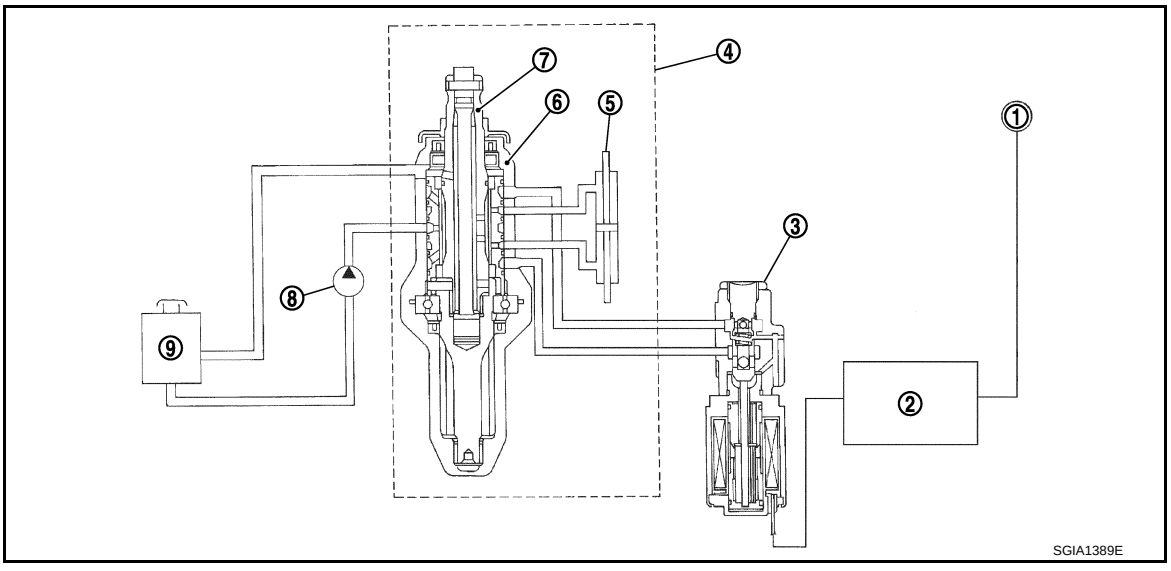
- The EPS system controls the power steering solenoid valve with 4WAS main control unit.
- The power steering solenoid valve control changes the power steering solenoid valve activation voltage according to the vehicle speed.



SYSTEM DIAGRAM



Sectional View

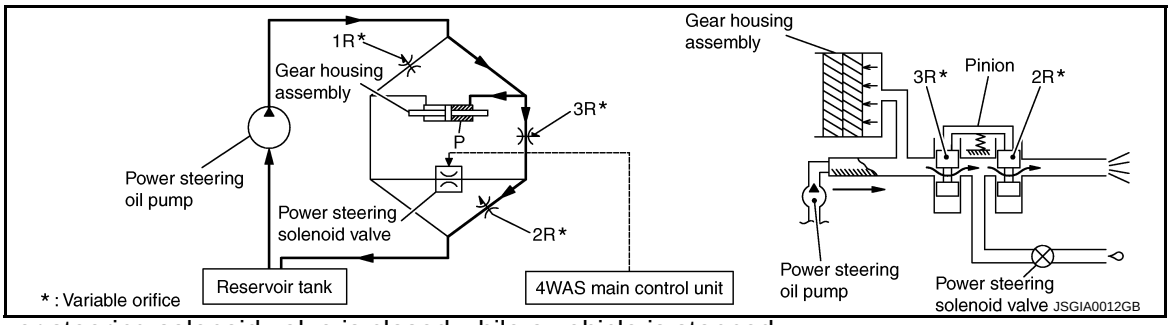


1. Vehicle speed sensor
2. 4WAS main control unit
3. Power steering solenoid valve
4. Steering gear assembly
5. Gear housing assembly
6. Gear-sub assembly
7. Pinion
8. Power steering oil pump
9. Reservoir tank

OPERATION PRINCIPLE

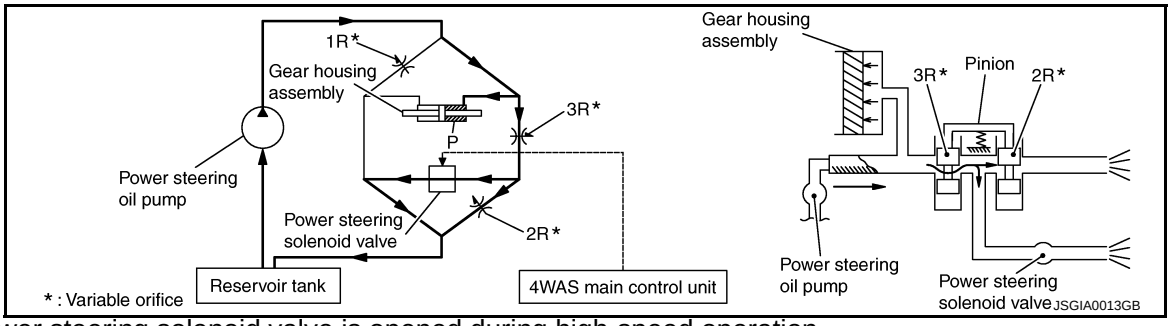
When turning the steering wheel to the right.

During Parking



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

During High-speed Operation

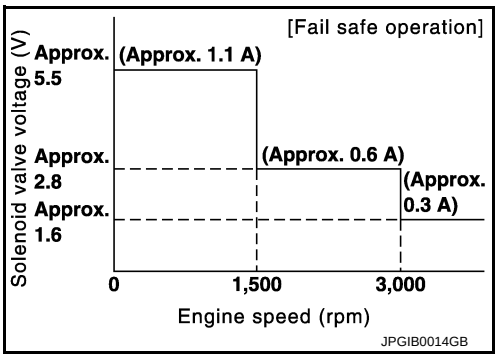


1. Power steering solenoid valve is opened during high-speed operation.
2. Pinion “1R”, “2R” and “3R” are closed depending on steering torque of steering wheel.
3. “2R” is bypassed to the return port by the EPS solenoid valve.
4. Oil pressure “P” in the gear housing assembly includes only oil pressure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

EPS SYSTEM : Fail-safe (4WAS Main Control Unit)

INFOID:0000000006046119

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



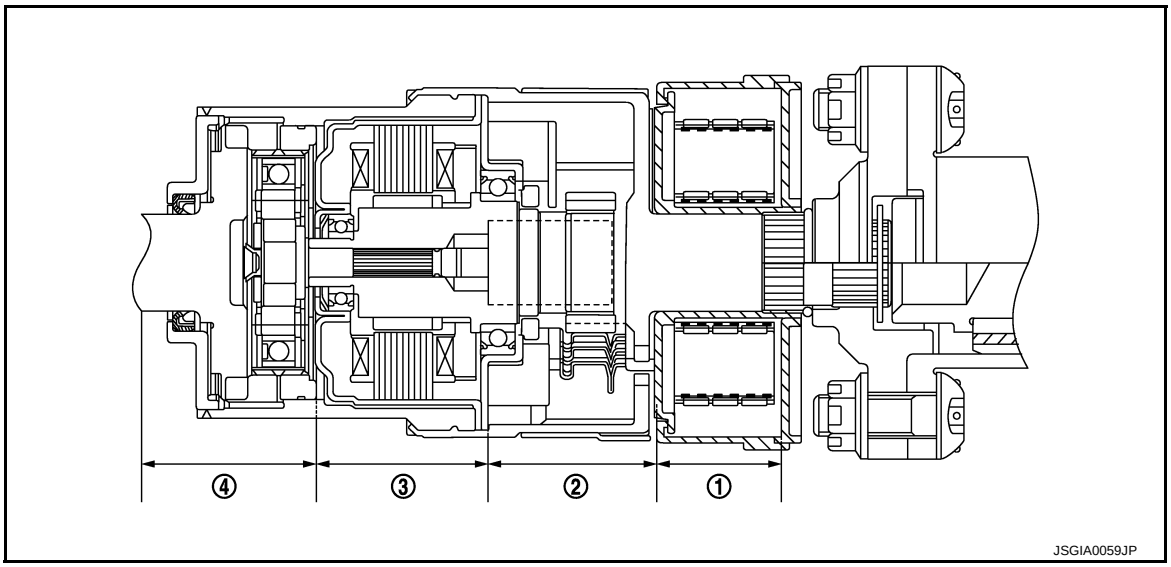
DTC	Error part and root cause	Contents of fail-safe
C1919	Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) via CAN communication. (Improper signal inputs while driving.)	Allows the steering force to be controlled without impairing the drive ability.

4WAS SYSTEM

4WAS SYSTEM : Sectional View

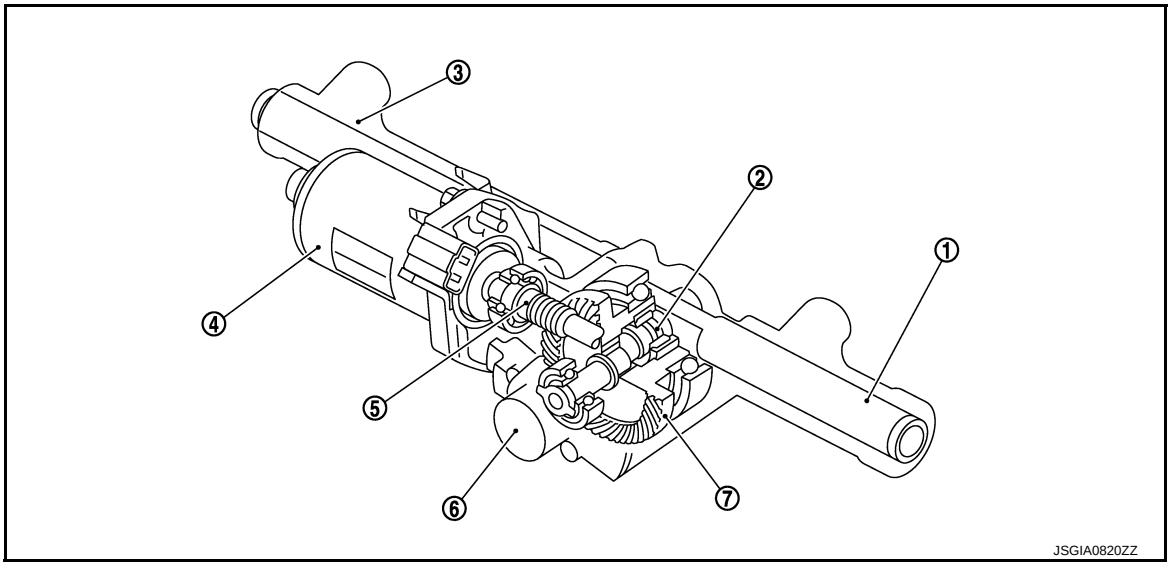
INFOID:0000000006044927

4WAS Front Actuator



1. Front wheel steering angle sensor
2. 4WAS front lock solenoid valve (lock structure)
3. 4WAS front motor
4. Gear shaft

4WAS Rear Actuator



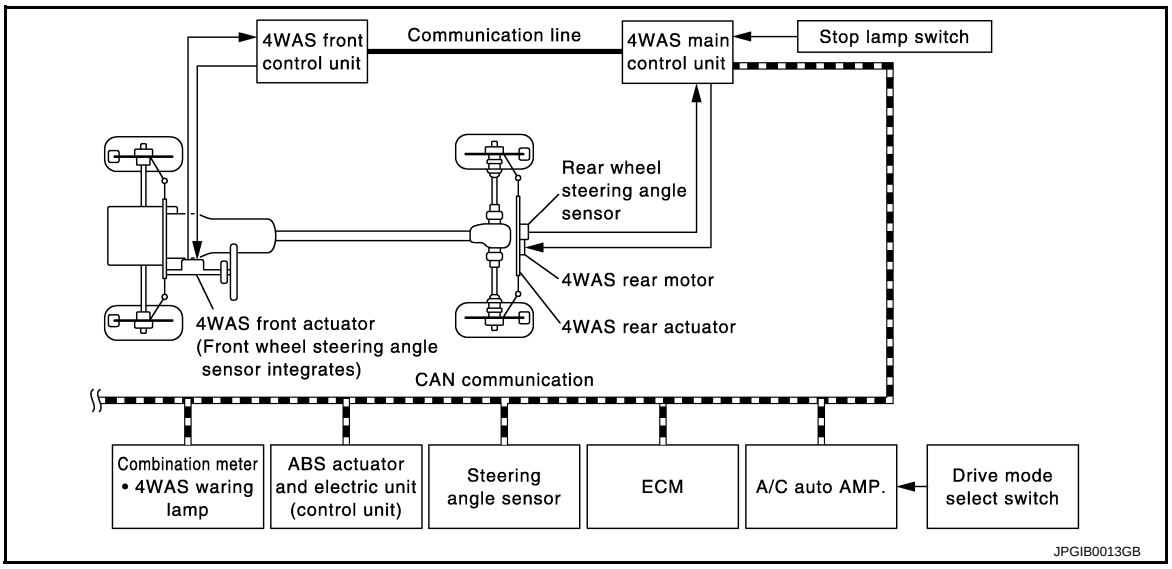
1. Rod
2. Offset shaft
3. Gear housing assembly
4. 4WAS rear motor
5. Motor shaft
6. Rear wheel steering angle sensor
7. HRH gear

4WAS SYSTEM : System Description

INFOID:0000000006044928

- 4WAS system consists of two control units (4WAS front control unit and 4WAS main control unit), 4WAS front actuator and 4WAS rear actuator components.
- 4WAS main control unit calculates front wheel and rear wheel angles via CAN communication based on the information of the steering angle sensor signal and vehicle speed signal.
- 4WAS main control unit controls 4WAS rear actuator according to the value calculated in 4WAS main control unit.
- It transmits the value that is calculated by 4WAS main control unit to 4WAS front control unit via 4WAS communication line (exclusive line of 4WAS system). 4WAS front control unit controls 4WAS front actuator based on the received demand.
- Self-diagnosis can be performed with CONSULT-III at each control unit to another (4WAS front control unit and 4WAS main control unit).
- INFINITY drive mode selector make it possible to change the steering characteristics of the front and rear wheels, and drive mode select switch is able to select STANDARD mode or SPORT mode.

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL

It transmits/receives each signal from the following control unit via communication line.

Component parts	Control signal
4WAS main control unit	Transmits/receives the following signal to 4WAS main control unit via communication line*. • 4WAS system control signal
Steering angle sensor	Transmits the following signal to 4WAS main control unit via CAN communication line. • Steering angle sensor signal
ABS actuator and electronic unit (control unit)	Transmits the following signal to 4WAS main control unit via CAN communication line. • Vehicle speed signal
ECM	Transmits the following signal to 4WAS main control unit via CAN communication line. • Engine speed signal
Combination meter	Receives the following signal to 4WAS main control unit via CAN communication line. • 4WAS warning lamp signal
A/C auto amp.	Transmits the following signal to 4WAS main control unit via CAN communication line. • Drive mode select switch signal

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

Operation Description

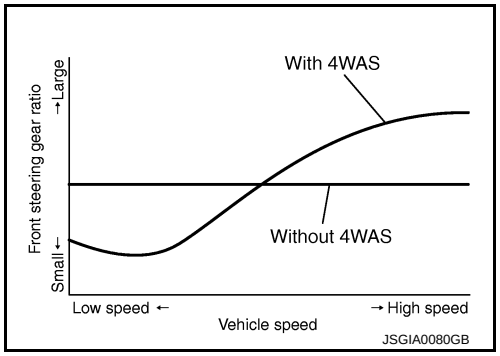
The following performance is gained by controlling the best front wheel steering angle and the rear wheel steering angle.

- The desirable vehicle movement is gained toward the driver's steering angle operation (steering angle).

- The steering gear ratio changes according to the vehicle speed. The steering wheel operation (steering angle) load decreases.
- In SPORT mode, the steering characteristics of the front and rear wheels are switched to reduce load of steering wheel operation (steering angle) more than that in STANDARD mode and enable smooth motion.

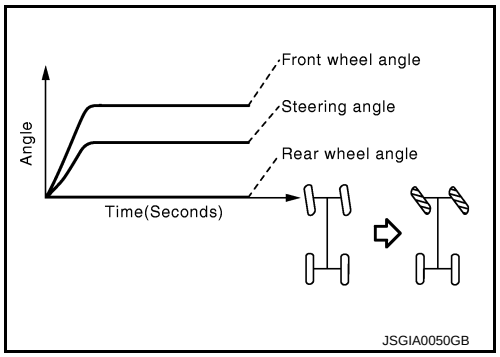
NOTE:

- When driving at low speed: In SPORT mode, make front steering wheel operation (steering angle) increase more than that in STANDARD mode.
- When driving at high speed: In SPORT mode, make rear steering wheel operation (steering angle) decrease more than that in STANDARD mode.



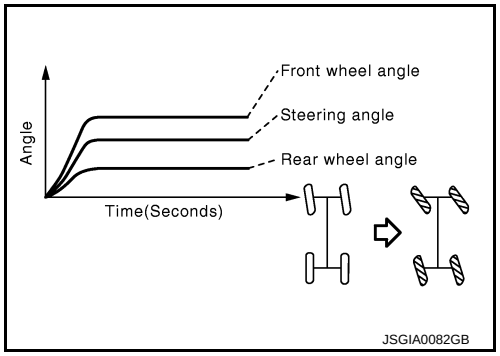
When Driving at Low Speed

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



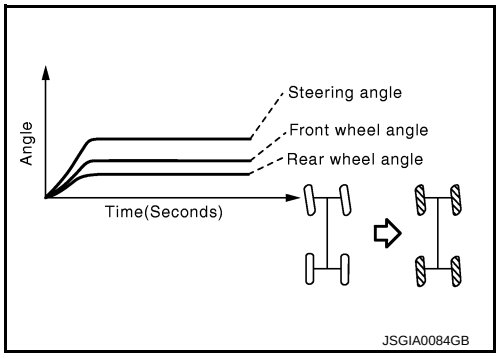
When Driving at Middle Speed

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



When Driving at High Speed

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



4WAS WARNING LAMP INDICATION CONDITION

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

Condition	4WAS warning lamp
Ignition switch OFF	OFF
Ignition switch ON	ON

Condition	4WAS warning lamp
After engine starts (system normal)	OFF
4WAS system malfunction	ON

4WAS SYSTEM : Fail-safe (4WAS Front Control Unit)

INFOID:0000000006046116

4WAS system enters in the fail-safe mode (4WAS system is stopped), and 4WAS warning lamp turns ON (except DTC “C1633”) if an error is detected in 4WAS system component part.

DTC	Error area and root cause	Contents of fail-safe
C1621	4WAS front motor current valve error is detected. (4WAS front motor current valve is excessively large.)	4WAS system is stopped.
C1622	4WAS front motor voltage valve or current error valve is detected. (4WAS front motor voltage valve error is detected.) (Voltage valve or current valve error is detected when starting the system.)	
C1627	The indication value from 4WAS front actuator (front wheel angle) differs from the value from 4WAS front control unit.	
C1628	The front wheel steering angle sensor error is detected.	
C1631	An error is detected inside 4WAS front control unit.	
C1632	An error is detected inside 4WAS front control unit.	
C1633	An error is detected inside 4WAS front control unit.	
C1651	The ignition voltage signal error is detected.	
C1652	4WAS front motor main power supply error is detected.	
C1654	An error is detected on the main relay power supply inside 4WAS front control unit.	
C1655	4WAS front motor 3-phase current error is detected. (Current is not applied to 4WAS front motor)	
C1661	4WAS front lock solenoid valve error is detected. (An electric activation error is detected.)	
C1667	4WAS front lock solenoid valve (lock) error is detected. (An error is detected in lock condition.)	
C1668	4WAS front lock solenoid valve (lock) error is detected. (Excessive force is applied to the lock.)	
C1669	4WAS front actuator error is detected. (An error is detected in unlock condition.)	
C1671	4WAS front actuator adjustment is not performed.	
C1672	4WAS front actuator adjustment is incomplete.	
C1684	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS main control unit.)	
C1685	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS main control unit.)	
C1686	An error is detected on 4WAS main control unit side. (4WAS main control unit fail-safe mode)	
U1000	When 4WAS front control unit is not transmitting or receiving 4WAS communication signal for 2 seconds or more.	
U1002	When 4WAS front control unit is not transmitting or receiving 4WAS communication signal for 2 seconds or less.	
U1010	When detecting error during the initial diagnosis of 4WAS controller of 4WAS front control unit	

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

4WAS SYSTEM : Fail-safe (4WAS Main Control Unit)

INFOID:0000000006046120

4WAS system enters in the fail-safe mode (4WAS system stopped) and 4WAS warning lamp turns ON if an error is detected in 4WAS system (4WAS main control unit) component part.

DTC	Error area and root cause		Contents of fail-safe
C1900	An error is detected inside 4WAS main control unit.		4WAS system stopped.
C1901	An error is detected inside 4WAS main control unit.		
C1902	4WAS rear motor current error is detected. (4WAS rear motor current output direction differs.)		
C1903	4WAS rear motor current error is detected. (Current is input to 4WAS main control unit if 4WAS main control unit output is “OFF”.)		
C1904	4WAS rear motor current error is detected. (4WAS rear motor output is overcurrent.)		
C1905	An error is detected inside 4WAS main control unit.		
C1906	An error is detected inside 4WAS main control unit.		
C1907	An error is detected inside 4WAS main control unit.		
C1908	An error is detected inside 4WAS main control unit.		
C1909	An error is detected inside 4WAS main control unit.		
C1910	4WAS rear motor inside error is detected. (4WAS rear motor does not move or the rear wheel angle sensor does not change if 4WAS main control unit output is 14 A or more.)		
C1911	4WAS rear motor voltage error is detected. (4WAS rear motor voltage is low.)		
C1912	4WAS rear motor voltage error is detected. (Voltage is applied to 4WAS main motor when 4WAS main control unit output is “OFF”.)		
C1913	4WAS rear motor current error is detected. (4WAS rear motor does not move or the rear wheel angle sensor output does not change when 4WAS main control unit output is 18 A or more, and 4WAS main motor output is low.)		
C1914	The rear wheel angle sensor power supply error is detected.		
C1915	The rear wheel angle sensor signal (main) error is detected.		
C1916	If the rear wheel angle sensor signal (sub) error is detected.		
C1917	The rear wheel angle sensor signal (main and sub) error is detected. (The output signal value differs temporarily between main and sub.)		
C1918	The rear wheel angle sensor signal (main and sub) error is detected. (The output signal value differs between main and sub.)		
C1919	Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) via CAN communication. (Improper signal inputs while driving.)		
C1920	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. (No transmission from the steering angle sensor)		
C1921	Malfunction is detected in engine speed signal that is output from ECM via CAN communication. (Improper signal is input engine speed.)	When DTC “C1921” is detected before starting the engine.	
		When DTC “C1921” is detected after starting the engine.	—

DTC	Error area and root cause		Contents of fail-safe
C1922	An error is detected inside 4WAS main control unit.		4WAS system stopped.
C1923	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. [Steering angle sensor input signal error is detected when driving.]		
C1924	Driving continuously at 10 km (6 mile) or more while the steering angle sensor value is not L10° - R10°. (Not detected in 4WAS front control unit fail-safe mode)		
C1925	An error is detected inside 4WAS main control unit.		
C1926	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. (When improper signal inputs to steering angle sensor and steering angle sensor itself detects the malfunction)		
C1927	An error is detected inside 4WAS main control unit.		
C1928	An error is detected inside 4WAS main control unit.		
C1930	An error is detected on 4WAS front control unit side. (4WAS front control unit fail-safe mode)		
C1931	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS front control unit.)		
C1932	If the steering angle sensor error is detected. (Steering angle sensor output value is abnormal.)		
C1933	An error is detected inside 4WAS main control unit.		
U1000	When 4WAS main control unit is not transmitting or receiving CAN communication signal for 2 seconds or more.	When 4WAS main control unit is not receiving following CAN communication signal. • Drive mode select switch signal	Mode is fixed to the mode when a malfunction of drive mode selector occurs. The mode is fixed to STANDARD mode after ignition switch OFF→ ON.
		When 4WAS main control unit is not receiving following CAN communication signal or 4WAS communication signal. • Steering angle sensor • Vehicle speed signal • Engine speed signal • 4WAS system control signal	4WAS system stopped.
U1010	When detecting error during the initial diagnosis of CAN controller of 4WAS main control unit.		

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

4WAS SYSTEM : Protection Function (4WAS Front Control Unit)

INFOID:0000000006046117

4WAS system enters in the protection function mode (4WAS system is temporarily stopped) if 4WAS system continues the heavy load condition and the overheat condition.4WAS system reactivates automatically if the heavy load condition and the overheat condition are resolved.4WAS warning lamp continues turning OFF in the protection function mode.

DTC	Error area and root cause	Contents of protection function
—	4WAS front control unit power supply temporary malfunctioning condition	4WAS system is temporarily stopped.
—	4WAS front control unit overheat condition	
—	4WAS front actuator overheat condition	
—	4WAS front control unit heavy load condition	

4WAS SYSTEM : Protection Function (4WAS Main Control Unit)

INFOID:0000000006046118

4WAS system enters in the protection function mode (4WAS system temporarily stopped) if 4WAS system continues the heavy load condition or the sensor self-check condition. (4WAS system reactivates automati-

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

DTC	Error area and root cause	Contents of protection function
—	4WAS main control unit power supply temporary malfunctioning condition	4WAS system is temporarily stopped.
—	4WAS system heavy load condition	
—	The sensor of 4WAS system is in self-check condition	

DIAGNOSIS SYSTEM (4WAS FRONT CONTROL UNIT)

CONSULT-III Function [4WAS(FRONT)]

INFOID:0000000006044933

APPLICATION ITEMS

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

Diagnostic test mode	Function
ECU Identification	4WAS front control unit part number can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*1
Data Monitor	Input/Output data in the 4WAS front control unit can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of 4WAS communication*2 can be read.
Active Test	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the 4WAS front control unit and also shifts some parameters in a specified range.

*1 : The following diagnosis information is erased by erasing.
- DTC
- Freeze frame data (FFD)

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

ECU IDENTIFICATION

4WAS front control unit part number can be read.

SELF DIAGNOSTIC RESULT

Refer to STC-61, "DTC Index".

When “0” is displayed
- It indicates that the system is presently malfunctioning.

When “1 – 39” is displayed
- It indicates that system malfunction in the past is detected, but the system is presently normal.

  NOTE:
  Each time when ignition switch is turned OFF to ON, numerical number increases in 1→2→3...38→39.
  When the operation number of times exceeds 39, the number do not increase and “39” is displayed until self-diagnosis is erased.

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed on CONSULT-III.

Freeze Frame Data Item	Description
4WAS STR ANG	The steering angle sensor signal received from 4WAS main control unit via 4WAS communication line * is indicated when DTC is detected.
VEHICLE SPEED	The vehicle speed signal received from 4WAS main control unit via 4WAS communication line * is indicated when DTC is detected.
MOTOR CURRENT	4WAS front motor power supply current is indicated when DTC is detected when DTC is detected. (4WAS front control unit main power supply)
MTR CRNT ESTM	The value, which 4WAS front control unit presumes 4WAS front motor power supply current, is indicated when DTC is detected. (4WAS front control unit main power supply)
ACTR ROTA ANG	4WAS front actuator increased/decreased angle is indicated when DTC is detected.
LG VOLT	4WAS front lock solenoid valve voltage is indicated when DTC is detected.
THERM TEMP	4WAS front control unit internal temperature is indicated when DTC is detected.
MOTOR VOLT	4WAS front motor power supply voltage is indicated when DTC is detected. (4WAS front control unit main power supply)
IGN VOLT	4WAS front control unit power supply voltage is indicated when DTC is detected. (Ignition switch power supply voltage)

Freeze Frame Data Item	Description
ACTR ANG COMM	The command value of 4WAS front actuator increased/decreased angle received from 4WAS main control unit via 4WAS communication line* is indicated when DTC is detected.
ACTR ROTA SPD	4WAS front actuator increased/decreased rotation speed is indicated when DTC is detected.
DUTY COMMAND	4WAS front actuator command voltage ratio is indicated when DTC is detected.
LOCK DTY COMM	4WAS front lock solenoid valve command voltage ratio is indicated when DTC is detected.
MTR U VOLT	4WAS front motor U terminal voltage is indicated when DTC is detected.
MTR V VOLT	4WAS front motor V terminal voltage is indicated when DTC is detected.
MTR W VOLT	4WAS front motor W terminal voltage is indicated when DTC is detected.
ACT TEMP ESTM	The value, which 4WAS front control unit presumes 4WAS front actuator temperature, is indicated when DTC is detected.
MTR PHZ CRNT	4WAS front motor U, V, and W terminal current is indicated when DTC is detected.
ACTR DEVI ANG	4WAS front actuator command value and the activation angle difference are indicated when DTC is detected.
ACTR ANGL SUB	The final command value, which 4WAS front control unit calculates 4WAS front actuator command value transmitted from 4WAS front control unit through 4WAS communication line*, is indicated when DTC is detected.
STR ANGL SPD	It displays an engine speed value obtained from an angle calculated with the 4WAS front control unit, based on steering angle sensor speed signals transmitted from the 4WAS main control unit through the 4WAS communication line* when DTC is detected.
OVRLD JDG FLG	4WAS system (the entire system) heavy load condition is indicated when DTC is detected.
OVRLD JDG TMG	It displays record of 4WAS system (entire 4WAS system) high load when DTC is detected. (It displays time of occurrence before turning ignition switch ON.)
ACT PRTCT FLG	4WAS system (4WAS front actuator) over-heated condition is indicated when DTC is detected.
ACT PRTCT TMG	It displays record of 4WAS system (4WAS front actuator) overheating when DTC is detected. (It displays time of occurrence before turning ignition switch ON.)
ECU PRTCT FLG	4WAS system (4WAS front control unit) over-heated condition is indicated when DTC is detected.
ECU PRTCT TMG	It displays record of 4WAS system (4WAS front control unit) overheating when DTC is detected. (It displays time of occurrence before turning ignition switch ON.)
DRV TMPO FLG	4WAS system (4WAS front motor terminal power supply converter) intermittent error is indicated when DTC is detected.
DRV TMPO TMG	It displays record of 4WAS system (terminal power supply converter of 4WAS front motor) intermittent abnormal when DTC is detected. (It displays time of occurrence before turning ignition switch ON.)
MTR PW TMP FL	4WAS system (4WAS front motor terminal power supply front driver) intermittent error is indicated when DTC is detected.
MTR PW TMP TM	It displays record of 4WAS system (terminal voltage of 4WAS front motor) intermittent abnormal when DTC is detected. (It displays time of occurrence before turning ignition switch ON.)
LOW VOLT FLG	4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) voltage-dropped condition when DTC is detected.
LOW VOLT TMG	It displays record of 4WAS system (terminal voltage of 4WAS front control unit and 4WAS front actuator) low voltage when DTC is detected. (It displays time of occurrence before turning ignition switch ON.)
HIGH VOLT FLG	4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) voltage-jumped condition when DTC is detected.
HIGH VOLT TMG	It displays record of 4WAS system (terminal voltage of 4WAS front control unit and 4WAS front actuator) extreme voltage when DTC is detected. (It displays time of occurrence before turning ignition switch ON.)
ACTR PATTERN	The status of 4WAS front motor U, V, W terminal output signal pattern is displayed when DTC is detected.

Freeze Frame Data Item	Description
MAIN ECU FAIL	4WAS main control unit fail-safe function condition transmitted from 4WAS main control unit through 4WAS communication line * is indicated when DTC is detected.
M-ECU TMPO FL]	The protection function mode status of 4WAS main control unit transmitted from 4WAS main control unit through 4WAS communication line* is indicated when DTC is detected.
LOCK MODE	4WAS front lock solenoid valve (lock structure) condition is indicated when DTC is detected. • 0: Lock released condition • 1 – 5: Lock condition
NEUTRAL OUT	4WAS front actuator misaligned angle adjustment control condition is indicated when DTC is detected.
EX OPERAT	4WAS system enters in the protection function due to the heavy load condition and temporarily abnormal voltage is indicated when DTC is detected.

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

DATA MONITOR

Monitor item (Unit)	Remarks
4WAS STR ANG [deg]	The steering angle sensor signal received from 4WAS main control unit via 4WAS communication line * is indicated.
VEHICLE SPEED [km/h] or [mph]	The vehicle speed signal received from 4WAS main control unit via 4WAS communication line * is indicated.
MOTOR CURRENT [A]	4WAS front motor power supply current is indicated. (4WAS front control unit main power supply)
MTR CRNT ESTM [A]	The value, which 4WAS front control unit presumes 4WAS front motor power supply current, is indicated. (4WAS front control unit main power supply)
ACTR ROTA ANG [deg]	4WAS front actuator increased/decreased angle is indicated.
LG VOLT [V]	4WAS front lock solenoid valve voltage is indicated.
THERM TEMP [°C]	4WAS front control unit internal temperature is indicated.
MOTOR VOLT [V]	4WAS front motor power supply voltage is indicated. (4WAS front control unit main power supply)
IGN VOLT [V]	4WAS front control unit power supply voltage is indicated. (Ignition switch power supply voltage)
ACTR ANG COMM [deg]	The command value of 4WAS front actuator increased/decreased angle received from 4WAS main control unit via 4WAS communication line* is indicated.
ACTR ROTA SPD [deg/s]	4WAS front actuator increased/decreased rotation speed is indicated.
DUTY COMMAND [%]	4WAS front actuator command voltage ratio is indicated.
LOCK DTY COMM [%]	4WAS front lock solenoid valve command voltage ratio is indicated.
MTR U VOLT [V]	4WAS front motor U terminal voltage is indicated.
MTR V VOLT [V]	4WAS front motor V terminal voltage is indicated.
MTR W VOLT [V]	4WAS front motor W terminal voltage is indicated.
ACT TEMP ESTM [°C]	The value, which 4WAS front control unit presumes 4WAS front actuator temperature, is indicated.
MTR PHZ CRNT [A]	4WAS front motor U, V, and W terminal current is indicated.
ACTR DEVI ANG [deg]	4WAS front actuator command value and the activation angle difference are indicated.
ACTR ANGL SUB [deg]	The final command value, which 4WAS front control unit calculates 4WAS front actuator command value transmitted from 4WAS front control unit through 4WAS communication line*, is indicated.
STR ANGL SPD [deg/s]	It displays an engine speed value obtained from an angle calculated with the 4WAS front control unit, based on steering angle sensor speed signals transmitted from the 4WAS main control unit through the 4WAS communication line*.
OVRLD JDG FLG [On/Off]	• 4WAS system (the entire system) heavy load condition is indicated. • 4WAS system protection function mode

Monitor item (Unit)	Remarks
OVRLD JDG TMG	It displays record of 4WAS system (entire 4WAS system) high load. (It displays time of occurrence before turning ignition switch ON.)
ACT PRTCT FLG [On/Off]	• 4WAS system (4WAS front actuator) over-heated condition is indicated. • 4WAS system protection function mode
ACT PRTCT TMG	It displays record of 4WAS system (4WAS front actuator) overheating. (It displays time of occurrence before turning ignition switch ON.)
ECU PRTCT FLG [On/Off]	• 4WAS system (4WAS front control unit) over-heated condition is indicated. • 4WAS system protection function mode
ECU PRTCT TMG	It displays record of 4WAS system (4WAS front control unit) overheating. (It displays time of occurrence before turning ignition switch ON.)
DRV TMPO FLG [On/Off]	• 4WAS system (4WAS front motor terminal power supply converter) intermittent error is indicated. • 4WAS system protection function mode
DRV TMPO TMG	It displays record of 4WAS system (terminal power supply converter of 4WAS front motor) intermittent abnormal. (It displays time of occurrence before turning ignition switch ON.)
MTR PW TMP FL [On/Off]	• 4WAS system (4WAS front motor terminal power supply front driver) intermittent error is indicated. • 4WAS system protection function mode
MTR PW TMP TM	It displays record of 4WAS system (terminal voltage of 4WAS front motor) intermittent abnormal. (It displays time of occurrence before turning ignition switch ON.)
LOW VOLT FLG [On/Off]	• 4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) voltage-dropped condition. • 4WAS system protection function mode
LOW VOLT TMG	It displays record of 4WAS system (terminal voltage of 4WAS front control unit and 4WAS front actuator) low voltage. (It displays time of occurrence before turning ignition switch ON.)
HIGH VOLT FLG [On/Off]	• 4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) voltage-jumped condition. • 4WAS system protection function mode
HIGH VOLT TMG	It displays record of 4WAS system (terminal voltage of 4WAS front control unit and 4WAS front actuator) extreme voltage. (It displays time of occurrence before turning ignition switch ON.)
ACTR PATTERN [1/2/3/4/5/6]	The status of 4WAS front motor U, V, W terminal output signal pattern is displayed.
MAIN ECU FAIL [On/Off]	4WAS main control unit fail-safe function condition transmitted from 4WAS main control unit through 4WAS communication line * is indicated.
M-ECU TMPO FL [On/Off]	The protection function mode status of 4WAS main control unit transmitted from 4WAS main control unit through 4WAS communication line* is indicated.
LOCK MODE [0/1/2/3/4/5]	4WAS front lock solenoid valve (lock structure) condition is indicated. • 0: Lock released condition • 1 – 5: Lock condition
NEUTRAL OUT [On/Off]	4WAS front actuator misaligned angle adjustment control condition is indicated.
EX OPERAT [On/Off]	4WAS system enters in the protection function due to the heavy load condition and temporarily abnormal voltage is indicated.
SLOW MODE [ON/OFF]	The judgment status of “SLOW MODE” on “ACTIVE TEST” is displayed.
MTR SEN AMPLTD1	It is displayed, but it is not used.
MTR SEN AMPLTD2	It is displayed, but it is not used.
MTR SEN OFFSET1	It is displayed, but it is not used.
MTR SEN OFFSET2	It is displayed, but it is not used.

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

CAN DIAGNOSTIC SUPPORT MONITOR

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

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

DISPLAYED RESULT (PRSNT)
- OK : It is normal.
- UNKWN : CONSULT-III cannot receive (transmit) the data transmitted (received) by the diagnosed unit normally.

DISPLAYED RESULT (PAST)
- OK : It is normal.
- When “0” is displayed : It indicates that the system is presently malfunctioning.
- When except “0” is displayed : It indicates that system malfunction in the past is detected, but the system is presently normal.
  NOTE:
  Each time when ignition switch is turned OFF to ON, numerical number increases in 1→2→3...38→39.
  When the operation number of times exceeds 39, the number do not increase and “39” is displayed until self-diagnosis is erased.

ACTIVE TEST MODE

Description
- 4WAS front actuator assembly activation is checked according to the control signal from CONSULT-III.
- 4WAS front lock solenoid valve (lock structure) is activated forcibly (ON/OFF) using each control signal of “LOCK OPERATION”. Perform this mode when performing 4WAS front actuator adjustment.
  CAUTION:
  Never steer the steering wheel during “RELEASE”.
- The steering angle sensor neutral point judgment (OK/NG) is performed using each control signal of “SLOW MODE”.

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

DIAGNOSIS SYSTEM (4WAS MAIN CONTROL UNIT)

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

INFOID:0000000006044934

APPLICATION ITEMS

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

Diagnostic test mode	Function
ECU Identification	4WAS main control unit part number can be read.
Self Diagnostic Result	Self-diagnostic results and freeze frame data can be read and erased quickly.*1
Data Monitor	Input/Output data in the 4WAS main control unit can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of 4WAS communication*2 can be read.
Active Test	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the 4WAS main control unit and also shifts some parameters in a specified range.

*1 : The following diagnosis information is erased by erasing.
- DTC
- Freeze frame data (FFD)

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

ECU IDENTIFICATION

4WAS main control unit part number can be read.

SELF DIAGNOSTIC RESULT

Refer to STC-68, "DTC Index".

When “0” is displayed
- It indicates that the system is presently malfunctioning.

When “1 – 39” is displayed
- It indicates that system malfunction in the past is detected, but the system is presently normal.

NOTE:
Each time when ignition switch is turned OFF to ON, numerical number increases in 1→2→3...38→39.
When the operation number of times exceeds 39, the number do not increase and “39” is displayed until self-diagnosis is erased.

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed on CONSULT-III.

Freeze Frame Data Item	Description
VHCL SPEED SE	The vehicle speed signal from ABS actuator and electric unit (control unit) is indicated with CAN communication line when DTC is detected.
STEERING ANG	The steering angle sensor signal from the steering angle sensor is indicated with CAN communication line when DTC is detected.
ENGINE SPEED	The engine speed signal from ECM is indicated with CAN communication line when DTC is detected.
STR ANGL SPD	The steering angle speed signal from the steering angle sensor is indicated with CAN communication line when DTC is detected.
POWER STR SOL	The current value of the power steering solenoid valve is indicated when DTC is detected.
RR ST ANG-MAI	The voltage of the rear wheel steering angle sensor (main) is indicated when DTC is detected.
RR ST ANG-SUB	The voltage of the rear wheel steering angle sensor (sub) is indicated when DTC is detected.
RR ST ANG-VOL	The power supply voltage of the rear wheel steering angle sensor is indicated when DTC is detected.
C/U VOLTAGE	The power supply voltage value of 4WAS main control unit is indicated when DTC is detected.
MOTOR VOLTAGE	The voltage value of 4WAS rear motor is indicated when DTC is detected.
MOTOR CURRENT	The current value of 4WAS rear motor is indicated when DTC is detected.
MTR CRNT OPE	The current value input to 4WAS rear motor is indicated when DTC is detected.

Freeze Frame Data Item	Description
RR ANGLE OPE	The angle command value is indicated for activating 4WAS rear motor when DTC is detected.
FR ANGLE OPE	The front wheel angle value transmitted from 4WAS main control unit to 4WAS front control unit is indicated when DTC is detected.
STOP LAMP SW	The stop lamp switch status is indicated when DTC is detected.
HICAS RELAY	4WAS rear motor relay condition is indicated when DTC is detected.
FAIL SAFE	The fail-safe mode status of 4WAS main control unit is indicated when DTC is detected.
WARNING LAMP	4WAS warning lamp ON/OFF condition is indicated when DTC is detected.
FRNT ECU FAIL	The fail-safe mode status of 4WAS main control unit transmitted from 4WAS front control unit via 4WAS communication line* is indicated when DTC is detected.
FRNT ECU EX	The protection function mode status of 4WAS front control unit transmitted from 4WAS front control unit via 4WAS communication line* is indicated when DTC is detected.
DRIVE MODE STAT	The status of 4WAS mode when DTC is detected.

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

DATA MONITOR

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

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

CAN DIAGNOSTIC SUPPORT MONITOR

- The communication status and the number of errors of 4WAS main control unit, ECM, ABS actuator and electric unit (control unit), 4WAS front control unit and the steering angle sensor are indicated.

- Error counter displays OK if any malfunction is not detected in the past. If the malfunction is detected, it displays 0. The upper limit of the counters is 39.

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

DISPLAYED RESULT (PRSNT)
- OK : It is normal.
- UNKWN : CONSULT-III cannot receive (transmit) the data transmitted (received) by the diagnosed unit normally.

DISPLAYED RESULT (PAST)
- OK : It is normal.
- When “0” is displayed : It indicates that the system is presently malfunctioning.
- When except “0” is displayed : It indicates that system malfunction in the past is detected, but the system is presently normal.
  NOTE:
  Each time when ignition switch is turned OFF to ON, numerical number increases in 1→2→3...38→39.
  When the operation number of times exceeds 39, the number do not increase and “39” is displayed until self-diagnosis is erased.

ACTIVE TEST MODE

Description
- 4WAS rear actuator assembly activation is checked according to the control signal from CONSULT-III.
- The control signal forcibly activates (ON/OFF) 4WAS rear assembly, performs the self-diagnosis and checks each sensor in “SELF DIAGNOSTIC MODE”.
  CAUTION:
  Perform the active test while the vehicle is stopped.

Select test item	Control signal	Remarks
SELF DIAGNOSTIC MODE	ON **CAUTION:** **Perform the active test while the vehicle is stopped.**	4WAS rear actuator assembly activates. It activates in the same direction as the steering angle by inputting the steering angle.
	OFF	4WAS rear actuator assembly stops the activation.

Standard value

Monitor item	Active test “ON”		
STEERING ANG	0° (Neutral)	R 90°	L 90°
RR ST ANG-MAI	2.4 V	Approx. 4.4 V	Approx. 0.4 V
RR ST ANG-SUB	2.4 V	Approx. 4.4 V	Approx. 0.4 V
MOTOR CURRENT	No output (Approx. 0 A)	Output (change)	

ECU DIAGNOSIS INFORMATION

4WAS FRONT CONTROL UNIT

Reference Value

INFOID:0000000006044935

VALUES ON THE DIAGNOSIS TOOL

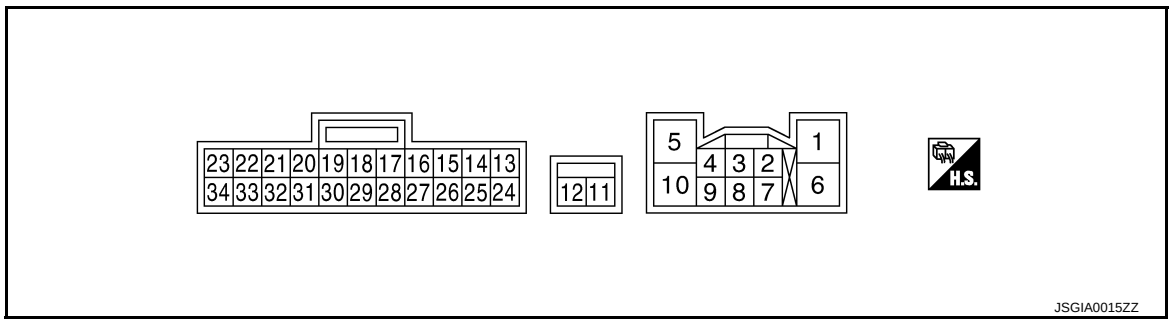
Monitor item	Condition		Value/Status
4WAS STR ANG	Steering wheel turned right		Approx. 0 – 550 deg
	Straight-ahead		Approx. 0 deg
	Steering wheel turned left		Approx. 0 – (–550) deg
VEHICLE SPEED	Vehicle stopped		0 km/h (0 MPH)
	Vehicle running **CAUTION:** **Check air pressure of tire under standard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

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

Monitor item	Condition		Value/Status
LOW VOLT TMG	It displays record of 4WAS system (terminal voltage of 4WAS front control unit and 4WAS front actuator) low voltage. (It displays time of occurrence before turning ignition switch ON.)		0 – 39
HIGH VOLT FLG	4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) over-voltage condition (Condition detected in past and present.)		On
	4WAS system (4WAS front control unit and 4WAS front actuator terminal voltage) over-voltage condition (Condition not detected in past and present.)*		Off
HIGH VOLT TMG	It displays record of 4WAS system (terminal voltage of 4WAS front control unit and 4WAS front actuator) extreme voltage. (It displays time of occurrence before turning ignition switch ON.)		0 – 39
ACTR PATTERN	The steering wheel is steering.		1 – 6
MAIN ECU FAIL	4WAS main control unit fail-safe mode		On
	4WAS system is in the normal condition. (When 4WAS main control unit is the normal condition.)		Off
M-ECU TMPO FL	4WAS main control unit protection function mode		On
	4WAS system is in the normal condition. (When 4WAS main control unit is the normal condition.)		Off
LOCK MODE	4WAS front lock solenoid valve (lock structure) condition	Lock released condition	0
		Lock condition	1, 2, 3, 4, 5
NEUTRAL OUT	4WAS front actuator misaligned angle adjustment control is controlled.		On
	4WAS front actuator misaligned angle adjustment is not controlled.		Off
EX OPERAT	4WAS system enters in the protection function due to the heavy load condition and temporarily abnormal voltage.		On
	4WAS system is in the normal condition.		Off
SLOW MODE	ACTIVE TEST “SLOW MODE” judgment condition (Steer the steering wheel rightward and leftward slowly. Steer until the turning stops.)		Ok
			—
MTR SEN AMPLTD 1	It is displayed, but it is not used.		—
MTR SEN AMPLTD 2	It is displayed, but it is not used.		—
MTR SEN OFFSET 1	It is displayed, but it is not used.		—
MTR SEN OFFSET 2	It is displayed, but it is not used.		—

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

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
1 (R)	—	4WAS front motor V terminal	—	—	—
2 (LG)	Ground	Front wheel angle sensor signal (sin)	Input	Ignition switch: ON	0 – 5 V
3 (B)	—	4WAS front lock solenoid valve ground	—	—	—
4 (B)	—	Front wheel angle sensor ground	—	—	—
5 (L)	—	4WAS front motor U terminal	—	—	—
6 (G)	—	4WAS front motor W terminal	—	—	—
7 (V)	Ground	Front wheel angle sensor signal (cos)	Input	Ignition switch: ON	0 – 5 V
8 (P)	Ground	Front wheel angle sensor signal (Excitation)	Output	Ignition switch: ON	0 – 5 V
10 (Y)	Ground	4WAS front lock solenoid valve power supply	Output	Ignition switch: ON	Battery voltage
				Ignition switch: OFF (Wait 10 min. or more.)	0 V
11 (R)	Ground	4WAS front motor power supply	Input	Ignition switch: ON	Battery voltage
				Ignition switch: OFF (Wait 10 min. or more.)	0 V
12 (B)	Ground	4WAS front motor ground	—	Always	0 V
14 (R)	—	4WAS communication-L	—	—	—
15 (W)	Ground	Ignition switch power supply	Input	Ignition switch: ON	Battery voltage
				Ignition switch: OFF	0 V
18 (B)	Ground	Ground	—	Always	0 V
25 (L)	—	4WAS communication-H	—	—	—
34 (B)	Ground	Ground	—	Always	0 V

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

Fail-safe (4WAS Front Control Unit)

INFOID:0000000006044936

4WAS system enters in the fail-safe mode (4WAS system is stopped), and 4WAS warning lamp turns ON (except DTC “C1633”) if an error is detected in 4WAS system component part.

DTC	Error area and root cause	Contents of fail-safe
C1621	4WAS front motor current valve error is detected. (4WAS front motor current valve is excessively large.)	4WAS system is stopped.
C1622	4WAS front motor voltage valve or current error valve is detected. (4WAS front motor voltage valve error is detected.) (Voltage valve or current valve error is detected when starting the system.)	
C1627	The indication value from 4WAS front actuator (front wheel angle) differs from the value from 4WAS front control unit.	
C1628	The front wheel steering angle sensor error is detected.	
C1631	An error is detected inside 4WAS front control unit.	
C1632	An error is detected inside 4WAS front control unit.	
C1633	An error is detected inside 4WAS front control unit.	
C1651	The ignition voltage signal error is detected.	
C1652	4WAS front motor main power supply error is detected.	
C1654	An error is detected on the main relay power supply inside 4WAS front control unit.	
C1655	4WAS front motor 3-phase current error is detected. (Current is not applied to 4WAS front motor)	
C1661	4WAS front lock solenoid valve error is detected. (An electric activation error is detected.)	
C1667	4WAS front lock solenoid valve (lock) error is detected. (An error is detected in lock condition.)	
C1668	4WAS front lock solenoid valve (lock) error is detected. (Excessive force is applied to the lock.)	
C1669	4WAS front actuator error is detected. (An error is detected in unlock condition.)	
C1671	4WAS front actuator adjustment is not performed.	
C1672	4WAS front actuator adjustment is incomplete.	
C1684	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS main control unit.)	
C1685	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS main control unit.)	
C1686	An error is detected on 4WAS main control unit side. (4WAS main control unit fail-safe mode)	
U1000	When 4WAS front control unit is not transmitting or receiving 4WAS communication signal for 2 seconds or more.	
U1002	When 4WAS front control unit is not transmitting or receiving 4WAS communication signal for 2 seconds or less.	
U1010	When detecting error during the initial diagnosis of 4WAS controller of 4WAS front control unit	

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

Protection Function (4WAS Front Control Unit)

INFOID:0000000006044937

4WAS system enters in the protection function mode (4WAS system is temporarily stopped) if 4WAS system continues the heavy load condition and the overheat condition.4WAS system reactivates automatically if the heavy load condition and the overheat condition are resolved.4WAS warning lamp continues turning OFF in the protection function mode.

DTC	Error area and root cause	Contents of protection function
—	4WAS front control unit power supply temporary malfunctioning condition	4WAS system is temporarily stopped.
—	4WAS front control unit overheat condition	
—	4WAS front actuator overheat condition	
—	4WAS front control unit heavy load condition	

DTC Inspection Priority Chart

INFOID:0000000006044938

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

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

*: 4WAS communication

DTC Index

INFOID:0000000006044939

DTC	Display Items	Reference
C1621	ACTUATOR	STC-92, "DTC Logic"
C1622	ACTUATOR	STC-92, "DTC Logic"
C1627	ACTUATOR	STC-95, "DTC Logic"
C1628	ACTUATOR	STC-96, "DTC Logic"
C1631	CONTROL UNIT	STC-98, "DTC Logic"
C1632	CONTROL UNIT	STC-98, "DTC Logic"
C1633	CONTROL UNIT	STC-101, "DTC Logic"
C1651	IGN POWER SUPPLY	STC-103, "DTC Logic"
C1652	MOTOR POWER SUPPLY	STC-105, "DTC Logic"
C1654	ACTUATOR RELAY	STC-107, "DTC Logic"
C1655	PRE-DRIVER	STC-109, "DTC Logic"
C1661	LOCK SOLENOID	STC-111, "DTC Logic"

DTC	Display Items	Reference
C1667	LOCK INSERTION	STC-113, "DTC Logic"
C1668	LOCK HLD GAP DETCT	STC-115, "DTC Logic"
C1669	INCOMP LOCK RELEAS	STC-116, "DTC Logic"
C1671	ACT ADJ NOT PRFRM	STC-117, "DTC Logic"
C1672	INCOMP ACTUATR ADJ	STC-118, "DTC Logic"
C1684	4WAS MAIN ECU COMM	STC-119, "DTC Logic"
C1685	4WAS MAIN ECU COMM	STC-119, "DTC Logic"
C1686	4WAS MAIN ECU	STC-123, "DTC Logic"
U1000	CAN COMM CIRCUIT	STC-124, "DTC Logic"
U1002	SYSTEM COMM(CAN)	STC-124, "DTC Logic"
U1010	CONTROL UNIT (CAN)	STC-128, "DTC Logic"

4WAS MAIN CONTROL UNIT

Reference Value

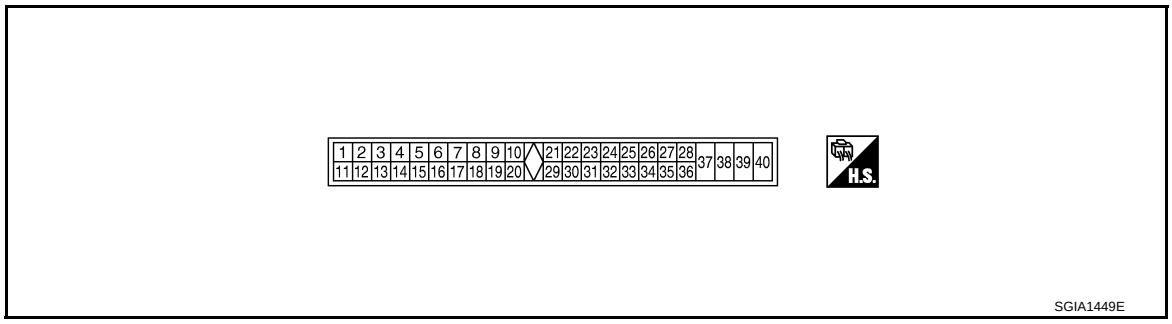
INFOID:0000000006044940

VALUES ON THE DIAGNOSIS TOOL

Monitor item	Condition	Value/Status
VHCL SPEED SE	Vehicle stopped	0 km/h (0 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%)
STEERING ANG	Steering wheel turned right	Approx. 0 – R550°
	Straight-ahead	Approx. 0°
	Steering wheel turned left	Approx. 0 – L550°
ENGINE SPEED	Engine stopped	0 rpm
	Engine running (Engine speed: 400 rpm or more)	Approximately equal to the indication on tachometer
STR ANGL SPD	The steering wheel is not steered.	0 deg/s
	The steering wheel is steering.	1 – 3,000 deg/s
POWER STR SOL	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	Approx. 1.10 A
	Vehicle speed: 100 km/h (62 MPH)	Approx. 0.42 A
RR ST ANG-MAI	4WAS rear actuator turns right completely	Approx. 4.4 V
	4WAS rear actuator is neutral	Approx. 2.4 V
	4WAS rear actuator turns left completely	Approx. 0.4 V
RR ST ANG-SUB	4WAS rear actuator turns right completely	Approx. 4.4 V
	4WAS rear actuator is neutral	Approx. 2.6 V
	4WAS rear actuator turns left completely	Approx. 0.4 V
RR ST ANG-VOL	Ignition switch: ON	Approx. 5 V
C/U VOLTAGE	Ignition switch: ON	Battery voltage
MOTOR VOLTAGE	Ignition switch: ON	Battery voltage
MOTOR CURRENT	4WAS rear motor running	0 – 20 A
MTR CRNT OPE	4WAS rear actuator neutral condition and vehicle straight-ahead position.	Approx. (–2) – (+2) A
	4WAS rear motor running	Approx. (–20) – (+20) A
RR ANGLE OPE	4WAS rear actuator turned right	Approx. 0 – 1 deg
	4WAS rear actuator is neutral	Approx. 0 deg
	4WAS rear actuator turned left	Approx. 0 – (–1) deg
FR ANGLE OPE	Steering wheel turned to the right (with vehicle stopped).	Approx. 0 – R60°
	Straight-ahead	Approx. 0°
	Steering wheel turned to the left (with vehicle stopped).	Approx. 0 – L60°
STOP LAMP SW	Brake pedal: Depressed	On
	Brake pedal: Released	Off
HICAS RELAY	Ignition switch: ON	On
FAIL SAFE	Fail-safe condition	On
	Normal	Off
WARNING LAMP	4WAS warning lamp: ON	On
	4WAS warning lamp: OFF	Off

Monitor item	Condition		Value/Status
FRNT ECU FAIL	4WAS front control unit fail-safe mode		On
	Normal		Off
FRNT ECU EX	4WAS front control unit enters in the protection function mode		On
	Normal		Off
DRIVE MODE STAT	Drive mode select switch: STANDARD⇒SPORT	Steering wheel: Neutral	STD⇒SP
		Steering wheel: Except neutral	STD
	Drive mode select switch: SPORT⇒STANDARD	Steering wheel: Neutral	SP⇒STD
		Steering wheel: Except neutral	SP

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	−	Signal name	Input/ Output		
1 (L)	—	CAN-H	—	—	—
4 (R)	Ground	Rear wheel steering angle sensor (main) output voltage	Output	4WAS rear actuator assembly turns right completely.	4.4 V
				4WAS rear actuator assembly is neutral	2.4 V
				4WAS rear actuator assembly turns left completely.	0.4 V
5 (V)	Ground	Rear wheel steering angle sensor power supply	Output	Ignition switch: ON	5 V
				Ignition switch: OFF	0 V
7 (LG)	Ground	Rear wheel steering angle sensor (sub) output voltage	Output	4WAS rear actuator assembly turns right completely.	4.6 V
				4WAS rear actuator assembly is neutral	2.6 V
				4WAS rear actuator assembly turns left completely.	0.6 V
8 (P)	—	CAN-L	—	—	—
15 (W)	Ground	Rear wheel steering angle sensor ground	—	Always	0 V
22 (P)	Ground	Stop lamp switch	Input	Brake pedal: Depressed	Battery voltage
				Brake pedal: Released	0 V
25 (G)	Ground	4WAS rear motor relay	Input	Ignition switch: ON	Battery voltage
				Ignition switch: OFF	0 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
27 (R)	Ground	Ignition switch	Input	Ignition switch: ON	Battery voltage
				Ignition switch: OFF	0 V
31 (W/L)	—	4WAS communication-H	—	—	—
32 (GR/V)	—	4WAS communication-L	—	—	—
34 (B/Y)	Ground	Ground	—	Always	0 V
36 (SB)	Ground	Power steering solenoid valve	Output	Vehicle speed: 0 km/h (0 MPH) (Engine speed: 400 rpm or more)	4.4 – 6.6 V
				Vehicle speed: 60 km/h (37 MPH)	1.4 – 3.6 V
37 (L)	Ground	4WAS rear motor power supply	Input	Ignition switch: ON	Battery voltage
				Ignition switch: OFF	0 V
38 (R)	Ground	4WAS rear motor output voltage (right)	Output	While 4WAS rear motor activates rightward	Battery voltage
				While 4WAS rear motor activates leftward	0 V
39 (P)	Ground	4WAS rear motor output voltage (left)	Output	While 4WAS rear motor activates rightward	0 V
				While 4WAS rear motor activates leftward	Battery voltage
40 (B/Y)	Ground	4WAS rear motor ground	—	Always	0 V

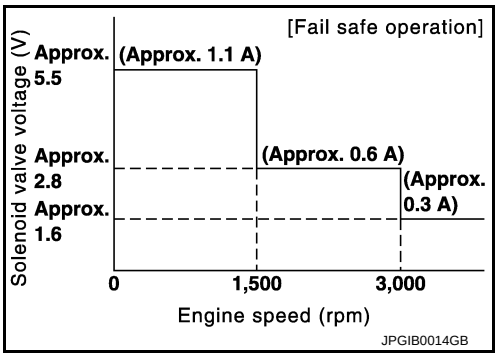
CAUTION:
When using circuit tester to measure voltage for inspection, never forcibly extend any connector terminals.

EPS SYSTEM

EPS SYSTEM : Fail-safe (4WAS Main Control Unit)

INFOID:0000000006044941

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



DTC	Error part and root cause	Contents of fail-safe
C1919	Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) via CAN communication. (Improper signal inputs while driving.)	Allows the steering force to be controlled without impairing the drive ability.

4WAS SYSTEM

4WAS SYSTEM : Fail-safe (4WAS Main Control Unit)

INFOID:0000000006044942

4WAS system enters in the fail-safe mode (4WAS system stopped) and 4WAS warning lamp turns ON if an error is detected in 4WAS system (4WAS main control unit) component part.

DTC	Error area and root cause		Contents of fail-safe
C1900	An error is detected inside 4WAS main control unit.		4WAS system stopped.
C1901	An error is detected inside 4WAS main control unit.		
C1902	4WAS rear motor current error is detected. (4WAS rear motor current output direction differs.)		
C1903	4WAS rear motor current error is detected. (Current is input to 4WAS main control unit if 4WAS main control unit output is “OFF”.)		
C1904	4WAS rear motor current error is detected. (4WAS rear motor output is overcurrent.)		
C1905	An error is detected inside 4WAS main control unit.		
C1906	An error is detected inside 4WAS main control unit.		
C1907	An error is detected inside 4WAS main control unit.		
C1908	An error is detected inside 4WAS main control unit.		
C1909	An error is detected inside 4WAS main control unit.		
C1910	4WAS rear motor inside error is detected. (4WAS rear motor does not move or the rear wheel angle sensor does not change if 4WAS main control unit output is 14 A or more.)		
C1911	4WAS rear motor voltage error is detected. (4WAS rear motor voltage is low.)		
C1912	4WAS rear motor voltage error is detected. (Voltage is applied to 4WAS main motor when 4WAS main control unit output is “OFF”.)		
C1913	4WAS rear motor current error is detected. (4WAS rear motor does not move or the rear wheel angle sensor output does not change when 4WAS main control unit output is 18 A or more, and 4WAS main motor output is low.)		
C1914	The rear wheel angle sensor power supply error is detected.		
C1915	The rear wheel angle sensor signal (main) error is detected.		
C1916	If the rear wheel angle sensor signal (sub) error is detected.		
C1917	The rear wheel angle sensor signal (main and sub) error is detected. (The output signal value differs temporarily between main and sub.)		
C1918	The rear wheel angle sensor signal (main and sub) error is detected. (The output signal value differs between main and sub.)		
C1919	Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) via CAN communication. (Improper signal inputs while driving.)		
C1920	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. (No transmission from the steering angle sensor)		
C1921	Malfunction is detected in engine speed signal that is output from ECM via CAN communication. (Improper signal is input engine speed.)	When DTC “C1921” is detected before starting the engine.	
		When DTC “C1921” is detected after starting the engine.	—

DTC	Error area and root cause		Contents of fail-safe
C1922	An error is detected inside 4WAS main control unit.		4WAS system stopped.
C1923	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. [Steering angle sensor input signal error is detected when driving.]		
C1924	Driving continuously at 10 km (6 mile) or more while the steering angle sensor value is not L10° - R10°. (Not detected in 4WAS front control unit fail-safe mode)		
C1925	An error is detected inside 4WAS main control unit.		
C1926	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. (When improper signal inputs to steering angle sensor and steering angle sensor itself detects the malfunction)		
C1927	An error is detected inside 4WAS main control unit.		
C1928	An error is detected inside 4WAS main control unit.		
C1930	An error is detected on 4WAS front control unit side. (4WAS front control unit fail-safe mode)		
C1931	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS front control unit.)		
C1932	If the steering angle sensor error is detected. (Steering angle sensor output value is abnormal.)		
C1933	An error is detected inside 4WAS main control unit.		
U1000	When 4WAS main control unit is not transmitting or receiving CAN communication signal for 2 seconds or more.	When 4WAS main control unit is not receiving following CAN communication signal. • Drive mode select switch signal	Mode is fixed to the mode when a malfunction of drive mode selector occurs. The mode is fixed to STANDARD mode after ignition switch OFF→ ON.
		When 4WAS main control unit is not receiving following CAN communication signal or 4WAS communication signal. • Steering angle sensor • Vehicle speed signal • Engine speed signal • 4WAS system control signal	4WAS system stopped.
U1010	When detecting error during the initial diagnosis of CAN controller of 4WAS main control unit.		

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

Protection Function (4WAS Main Control Unit)

INFOID:0000000006044943

4WAS system enters in the protection function mode (4WAS system temporarily stopped) if 4WAS system continues the heavy load condition or the sensor self-check condition. (4WAS system reactivates automatically if the heavy load condition and the self-check condition are resolved.) 4WAS warning lamp stays OFF in the protection function mode.

DTC	Error area and root cause	Contents of protection function
—	4WAS main control unit power supply temporary malfunctioning condition	4WAS system is temporarily stopped.
—	4WAS system heavy load condition	
—	The sensor of 4WAS system is in self-check condition	

DTC Inspection Priority Chart

INFOID:0000000006044944

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

Priority	Detected items (DTC)
1	• U1000 CAN COMM • U1010 CONTROL UNIT (CAN) • C1931 4WAS FRONT ECU COMM
2	• C1900 CONTROL UNIT [ABNORMAL1] • C1901 CONTROL UNIT [ABNORMAL2] • C1905 CONTROL UNIT [ABNORMAL3] • C1906 CONTROL UNIT [ABNORMAL5] • C1907 CONTROL UNIT [ABNORMAL4] • C1908 CONTROL UNIT [ABNORMAL7] • C1909 CONTROL UNIT [ABNORMAL6] • C1922 CONTROL UNIT [ABNORMAL8] • C1925 AD CONVERTER • C1927 CONTROL UNIT [ABNORMAL5] • C1928 CONTROL UNIT [ABNORMAL9] • C1933 CONTROL UNIT
3	• C1902 MOTOR OUTPUT [REV CURRENT] • C1903 MOTOR OUTPUT [NO CURRENT] • C1904 MOTOR OUTPUT [OVERCURRENT] • C1910 MOTOR OUTPUT [MOTOR LOCK] • C1911 MOTOR VOLTAGE [LOW VOLTAGE] • C1912 MOTOR VOLTAGE [BAD OBSTRCT] • C1913 MOTOR OUTPUT [ABNORML SIG] • C1914 RR ST ANGLE SENSOR [ABNORML VOL] • C1915 RR ST ANGLE SENSOR [MAIN SIGNAL] • C1916 RR ST ANGLE SENSOR [SUB SIGNAL] • C1917 RR ST ANGLE SENSOR [OFFSET SIG1] • C1918 RR ST ANGLE SENSOR [OFFSET SIG2]
4	• C1919 VEHICLE SPEED SEN [NO SIGNAL] • C1920 STEERING ANGLE SEN [NO SIGNAL] • C1921 ENG REV SIGNAL • C1923 STEERING ANGLE SEN [NO CHANGE] • C1924 STEERING ANGLE SEN [NO NEUT STATE] • C1926 STEERING ANGLE SEN • C1932 STEERING ANGLE SEN
5	• C1930 4WAS FRONT ECU

DTC Index

INFOID:0000000006044945

DTC	Items (CONSULT-III screen terms)	Reference
C1900	CONTROL UNIT [ABNORMAL1]	STC-129, "DTC Logic"
C1901	CONTROL UNIT [ABNORMAL2]	STC-129, "DTC Logic"
C1902	MOTOR OUTPUT [REV CURRENT]	STC-131, "DTC Logic"
C1903	MOTOR OUTPUT [NO CURRENT]	STC-131, "DTC Logic"
C1904	MOTOR OUTPUT [OVERCURRENT]	STC-131, "DTC Logic"
C1905	CONTROL UNIT [ABNORMAL3]	STC-134, "DTC Logic"
C1906	CONTROL UNIT [ABNORMAL5]	STC-129, "DTC Logic"
C1907	CONTROL UNIT [ABNORMAL4]	STC-129, "DTC Logic"

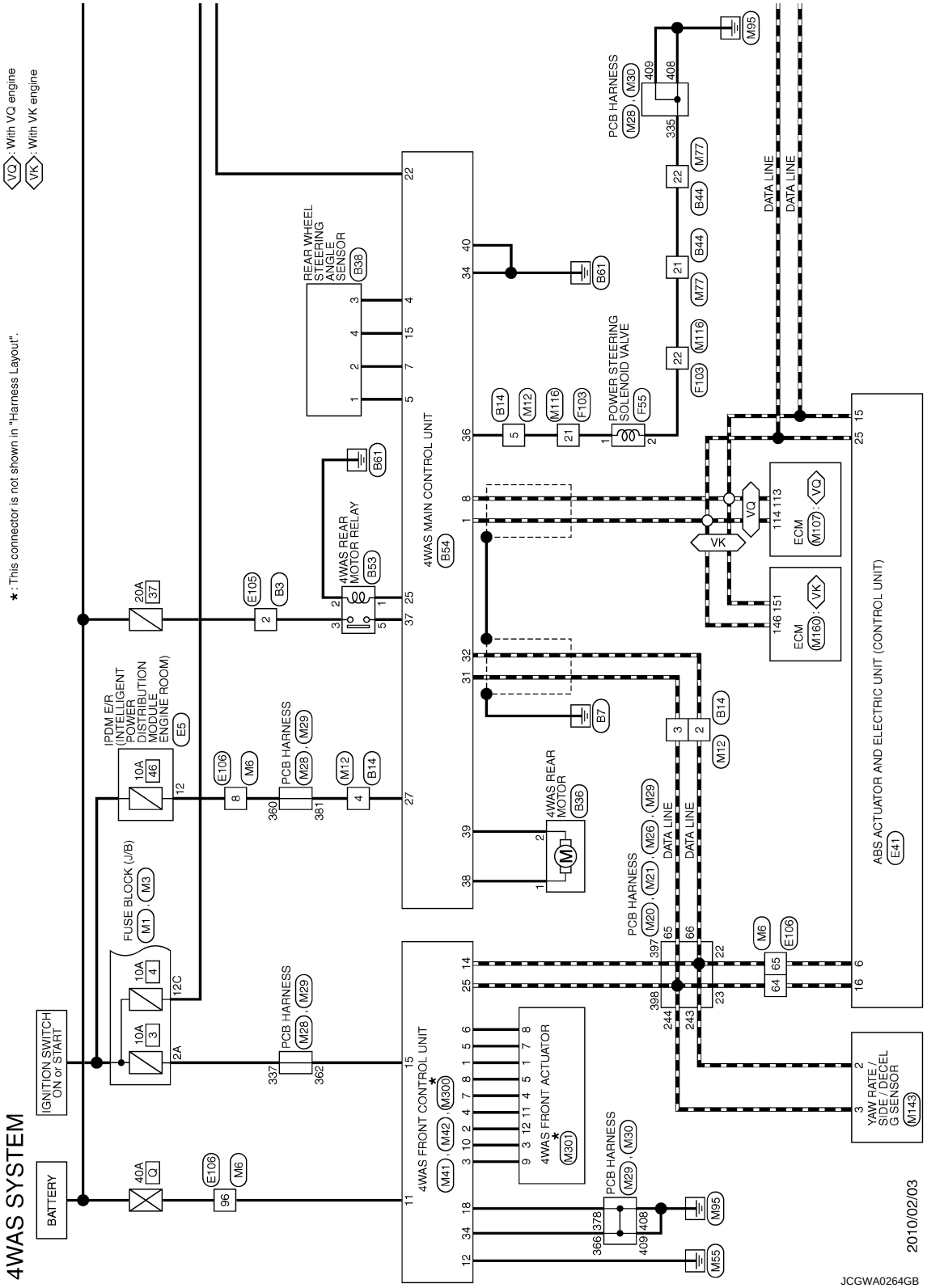
DTC	Items (CONSULT-III screen terms)	Reference
C1908	CONTROL UNIT [ABNORMAL7]	STC-134, "DTC Logic"
C1909	CONTROL UNIT [ABNORMAL6]	STC-136, "DTC Logic"
C1910	MOTOR OUTPUT [MOTOR LOCK]	STC-131, "DTC Logic"
C1911	MOTOR VOLTAGE [LOW VOLTAGE]	STC-138, "DTC Logic"
C1912	MOTOR VOLTAGE [BAD OBSTRCT]	STC-138, "DTC Logic"
C1913	MOTOR OUTPUT [ABNORML SIG]	STC-131, "DTC Logic"
C1914	RR ST ANGLE SENSOR [ABNORML VOL]	STC-142, "DTC Logic"
C1915	RR ST ANGLE SENSOR [MAIN SIGNAL]	STC-145, "DTC Logic"
C1916	RR ST ANGLE SENSOR [SUB SIGNAL]	STC-145, "DTC Logic"
C1917	RR ST ANGLE SENSOR [OFFSET SIG1]	STC-148, "DTC Logic"
C1918	RR ST ANGLE SENSOR [OFFSET SIG2]	STC-148, "DTC Logic"
C1919	VEHICLE SPEED SEN [NO SIGNAL]	STC-151, "DTC Logic"
C1920	STEERING ANGLE SEN [NO SIGNAL]	STC-153, "DTC Logic"
C1921	ENG REV SIGNAL	STC-155, "DTC Logic"
C1922	CONTROL UNIT [ABNORMAL8]	STC-134, "DTC Logic"
C1923	STEERING ANGLE SEN [NO CHANGE]	STC-157, "DTC Logic"
C1924	STEERING ANGLE SEN [NO NEUT STATE]	STC-159, "DTC Logic"
C1925	AD CONVERTER	STC-134, "DTC Logic"
C1926	STEERING ANGLE SEN	STC-161, "DTC Logic"
C1927	CONTROL UNIT [ABNORMAL5]	STC-129, "DTC Logic"
C1928	CONTROL UNIT [ABNORMAL9]	STC-134, "DTC Logic"
C1930	4WAS FRONT ECU	STC-163, "DTC Logic"
C1931	4WAS FRONT ECU COMM	STC-164, "DTC Logic"
C1932	STEERING ANGLE SEN	STC-161, "DTC Logic"
C1933	CONTROL UNIT	STC-129, "DTC Logic"
U1000	CAN COMM	STC-168, "Description"
U1010	CONTROL UNIT (CAN)	STC-169, "DTC Logic"

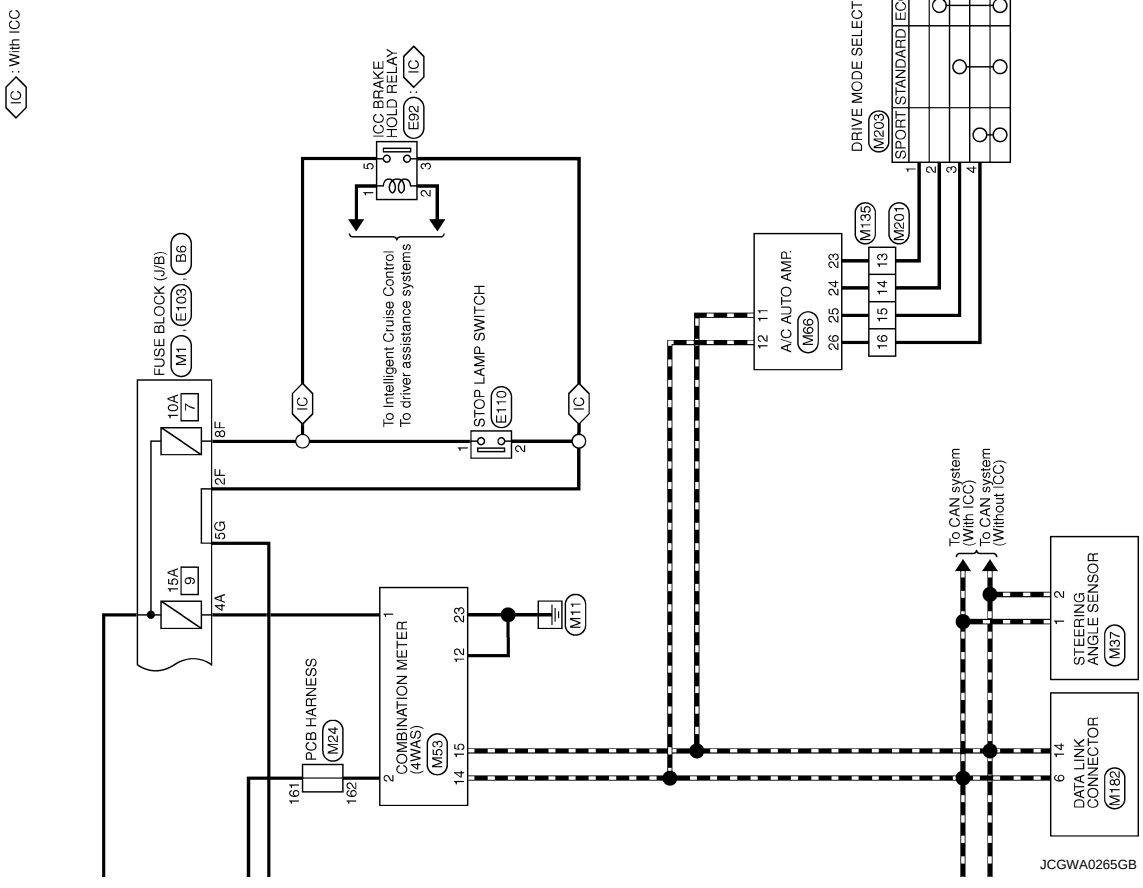
WIRING DIAGRAM

4WAS SYSTEM

Wiring Diagram

INFOID:0000000006044946

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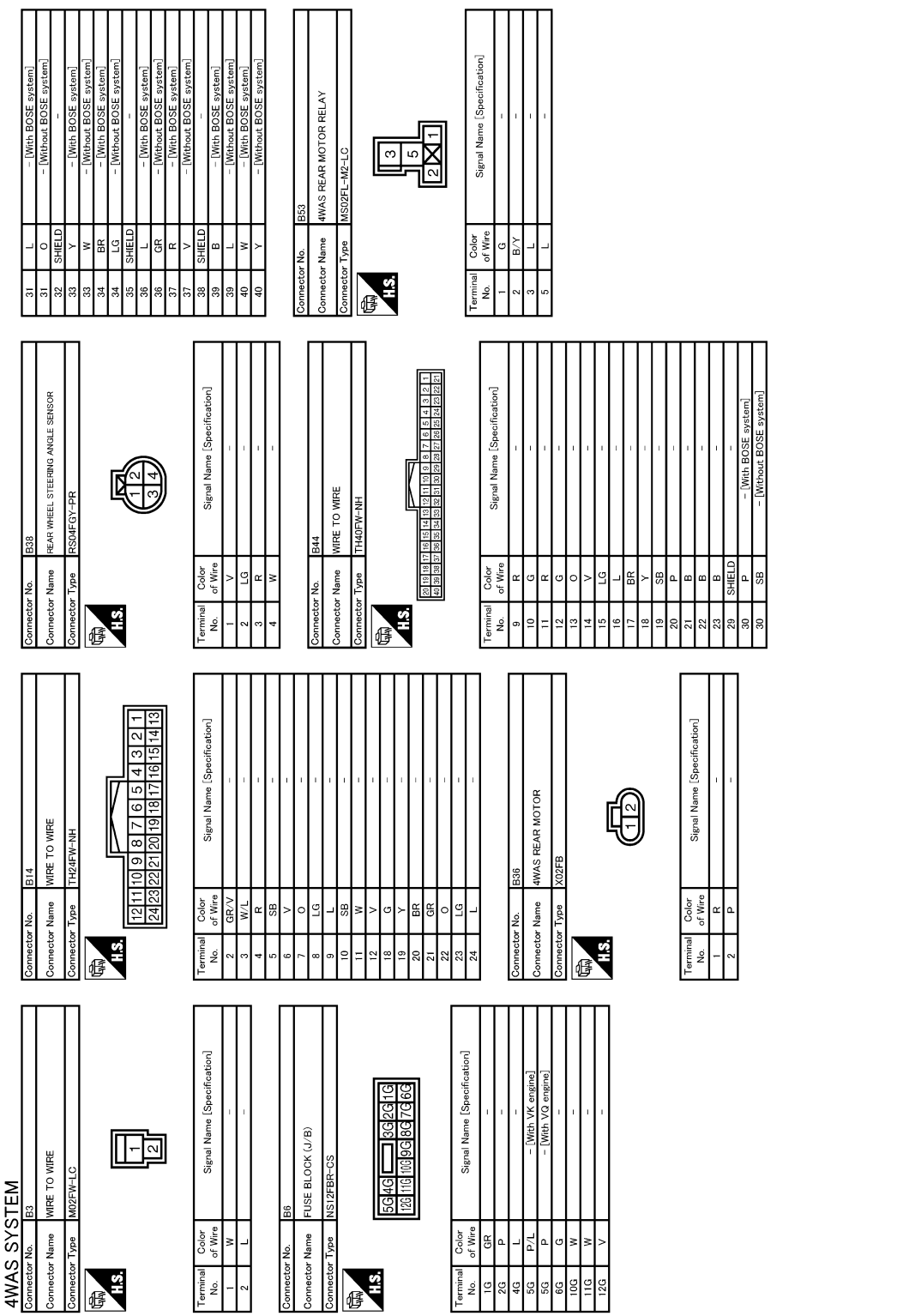
FUSE BLOCK (J/B)
M1 : E103 : B6
10A 7
15A 9
8F
2F
5G
4A
ICC BRAKE HOLD RELAY
E92 : IC
To Intelligent Cruise Control
To driver assistance systems
STOP LAMP SWITCH
E110
PCB HARNESS
M24
161
162
COMBINATION METER
(4WAS)
M53
M11
A/C AUTO AMP.
M66
M135
M201
DRIVE MODE SELECT SWITCH
M203
SPORT STANDARD ECO SNOW
PCB HARNESS
M26 : M30
409
408
245
29
M135
M201
M95
To CAN system
(With ICC)
To CAN system
(Without ICC)
STEERING
ANGLE SENSOR
M37
DATA LINK
CONNECTOR
M182
JCGWA0265GB



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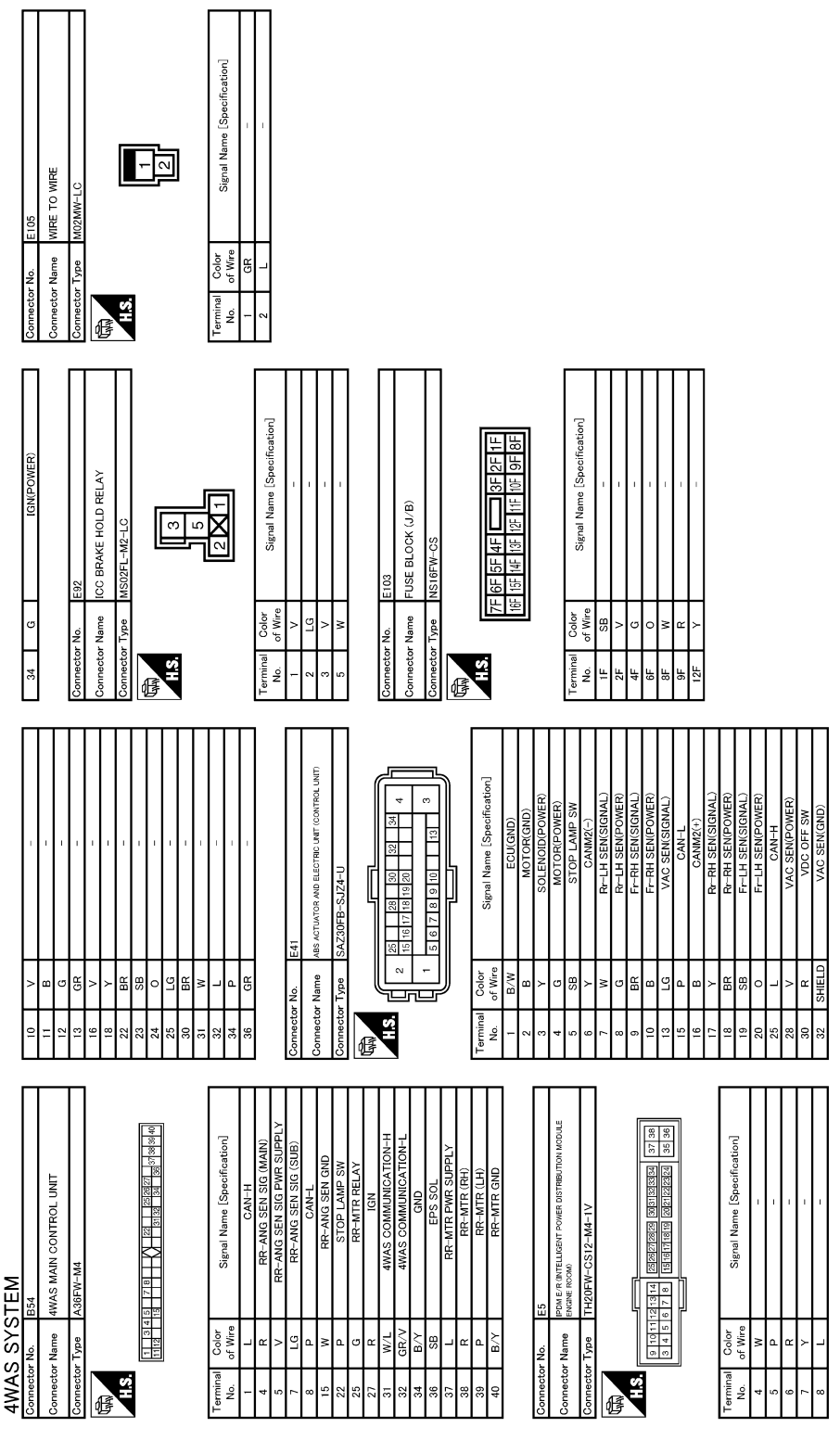

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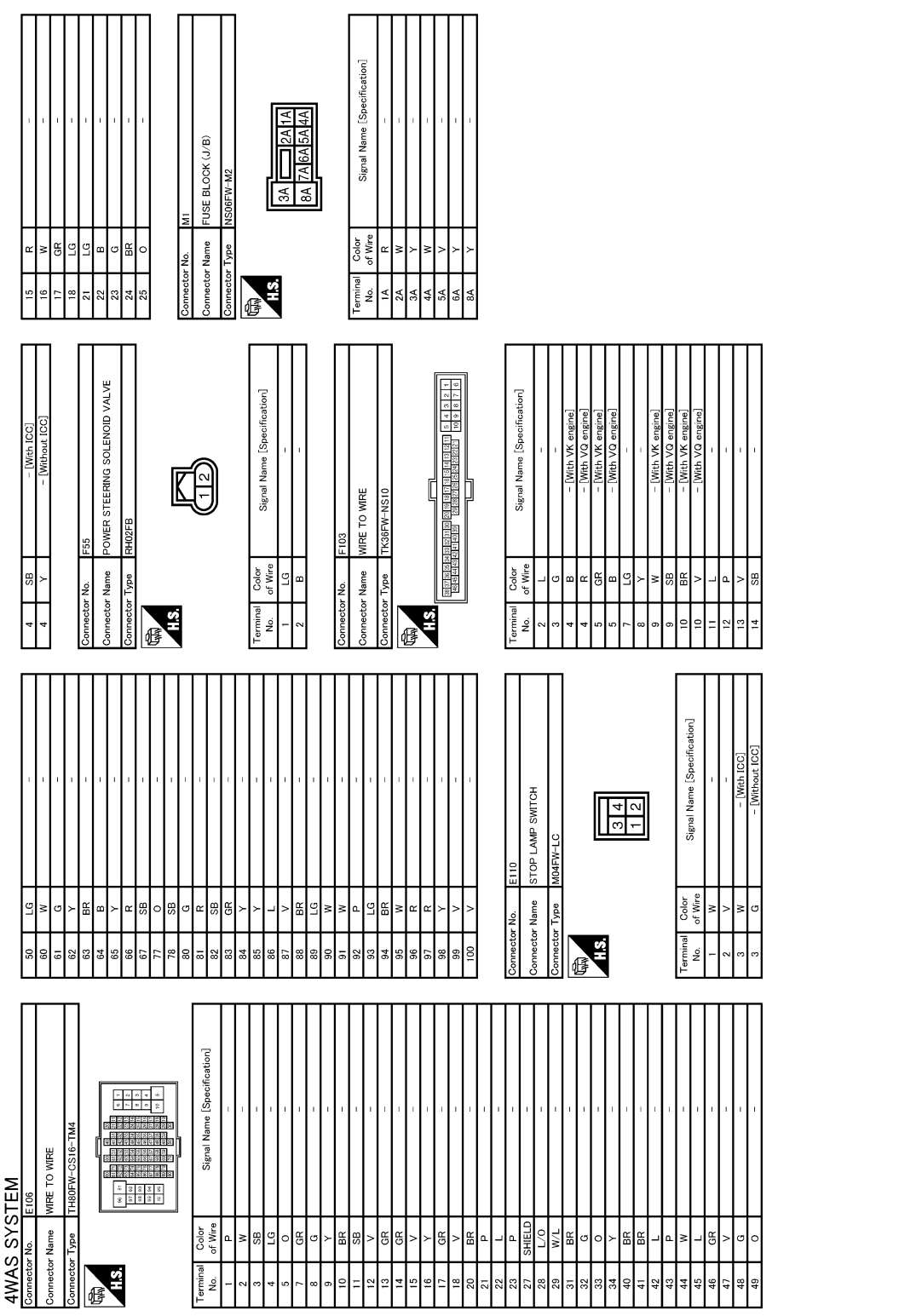

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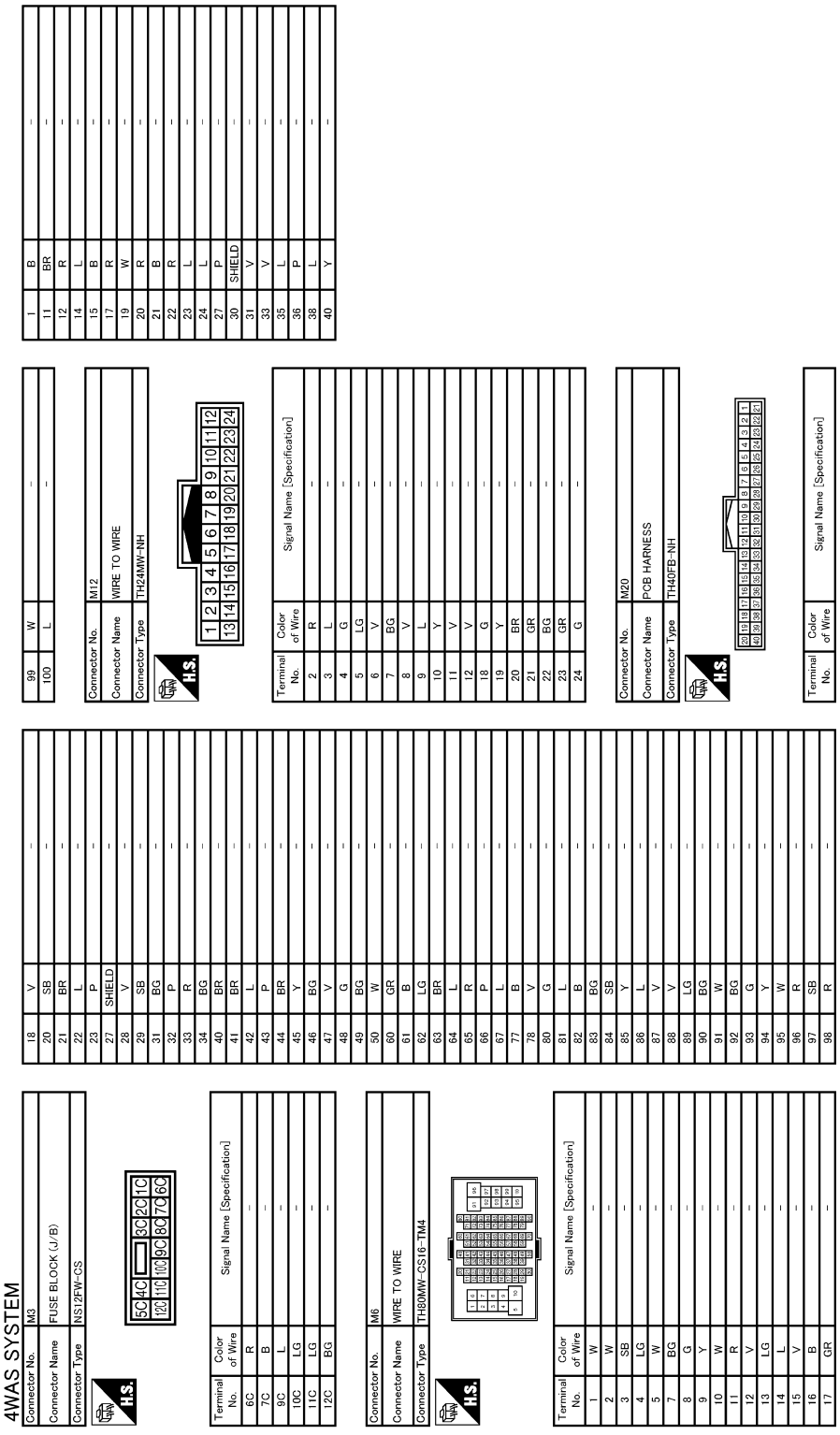

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4WAS SYSTEM

Connector No.	M21
Connector Name	PCB HARNESS
Connector Type	TH40FW-NH

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
41	LG	–
42	SHIELD	–
43	V	– [With BOSE system]
43	V	– [Without BOSE system]
44	BR	– [With BOSE system]
44	P	– [Without BOSE system]
45	SHIELD	–
46	SB	– [With BOSE system]
46	G	– [Without BOSE system]
47	V	– [With BOSE system]
47	GR	– [Without BOSE system]
48	SHIELD	–
49	R	–
50	G	– [With BOSE system]
50	BR	– [Without BOSE system]
51	SHIELD	–
52	P	– [With BOSE system]
52	L	– [Without BOSE system]
53	L	– [With BOSE system]
53	G	– [Without BOSE system]
54	Y	–
55	BR	–
56	G	–
57	R	–
61	SB	–
62	SB	–
63	LG	–
64	B	–
65	L	–
66	R	–
69	V	–

Connector No.	M24
Connector Name	PCB HARNESS
Connector Type	TH40FW-NH

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
161	BG	–
162	BG	–
163	G	–
164	V	–
165	V	–
166	R	–
167	LG	–
168	R	–
169	R	–
170	B	–
172	B	–
174	W	–
175	B	–
176	L	–
177	P	–
178	Y	–
179	L	–
180	LG	–
182	BR	–
183	G	–
184	V	–
185	P	– [With BOSE system]
185	V	– [Without BOSE system]
186	R	–
187	L	–
188	Y	–
189	B	–
190	V	–
191	G	–
192	B	–
193	SB	–
194	BR	–
198	R	–
199	B	–
200	SB	–

Connector No.	M26
Connector Name	PCB HARNESS
Connector Type	TH40FW-NH

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
241	L	–
243	R	–
244	L	–
245	B	–
246	B	–
247	LG	– [With Climate controlled seat]
247	B	– [With heated seat]
249	SHIELD	–
250	SHIELD	–
253	P	– [With Climate controlled seat]
253	B	– [With heated seat]
254	W	– [With Climate controlled seat]
254	B	– [With heated seat]
255	B	–
256	SHIELD	–
257	SHIELD	–
258	R	–
259	L	–
260	BG	–
261	P	–
269	GR	–
270	Y	–
271	BR	–
272	G	–
273	R	–
274	R	–
275	Y	–
276	B	–
277	G	–
278	R	–
279	SB	– [With Climate controlled seat]
279	R	– [With heated seat]
280	Y	–

Connector No.	M28
Connector Name	PCB HARNESS
Connector Type	TH40FW-NH

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
321	V	–
322	V	–
324	B	–
325	L	–
326	L	–
327	P	–
328	P	–
330	B	–
331	V	–
332	V	–
335	B	–
337	W	–
338	W	–
343	L	–
344	B	–
345	Y	–
346	L	–
347	P	–
348	GR	–
349	V	–
350	LG	–
351	P	–
352	R	–
353	P	–
358	W	–
359	W	–
360	G	–

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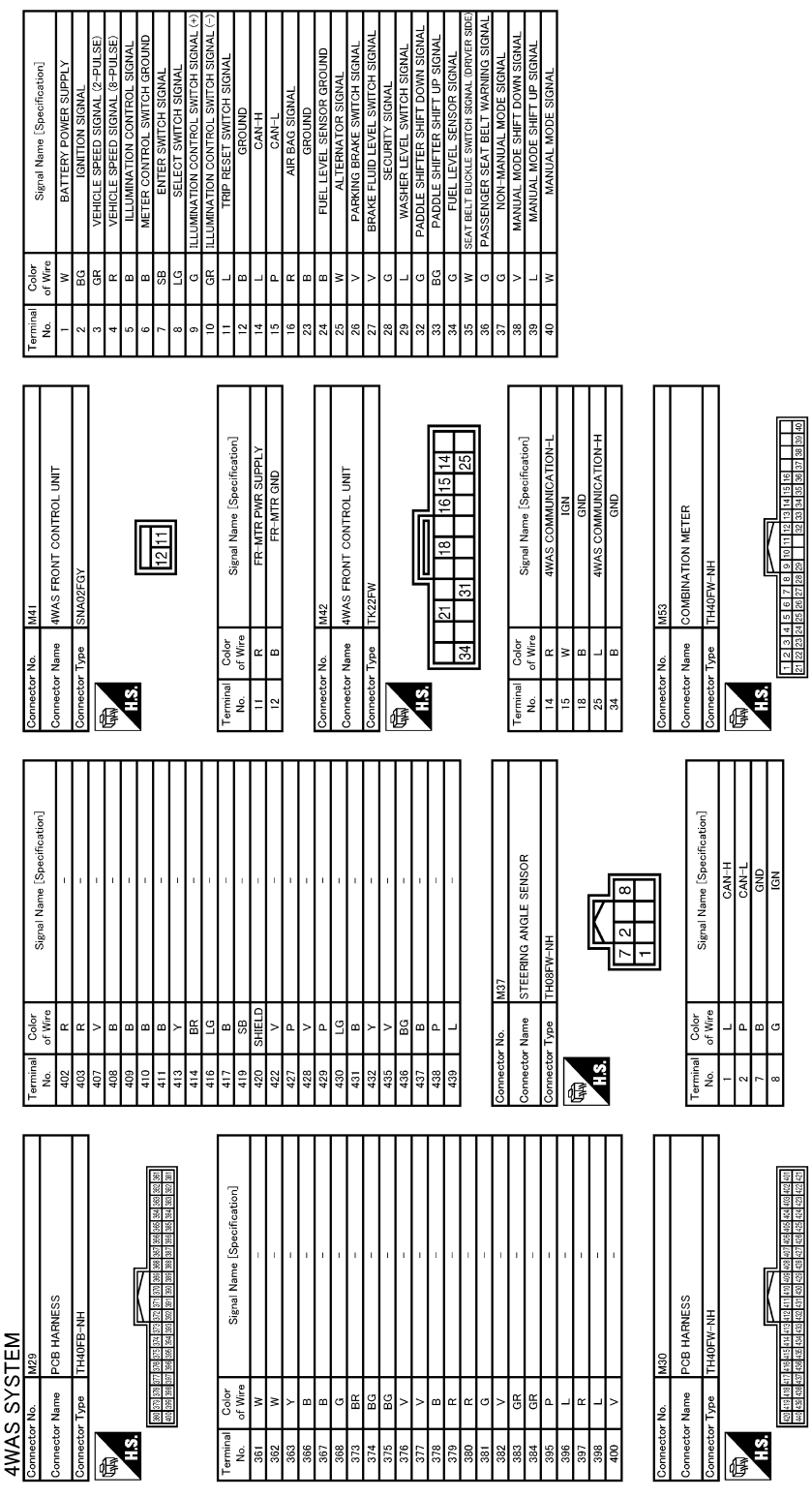

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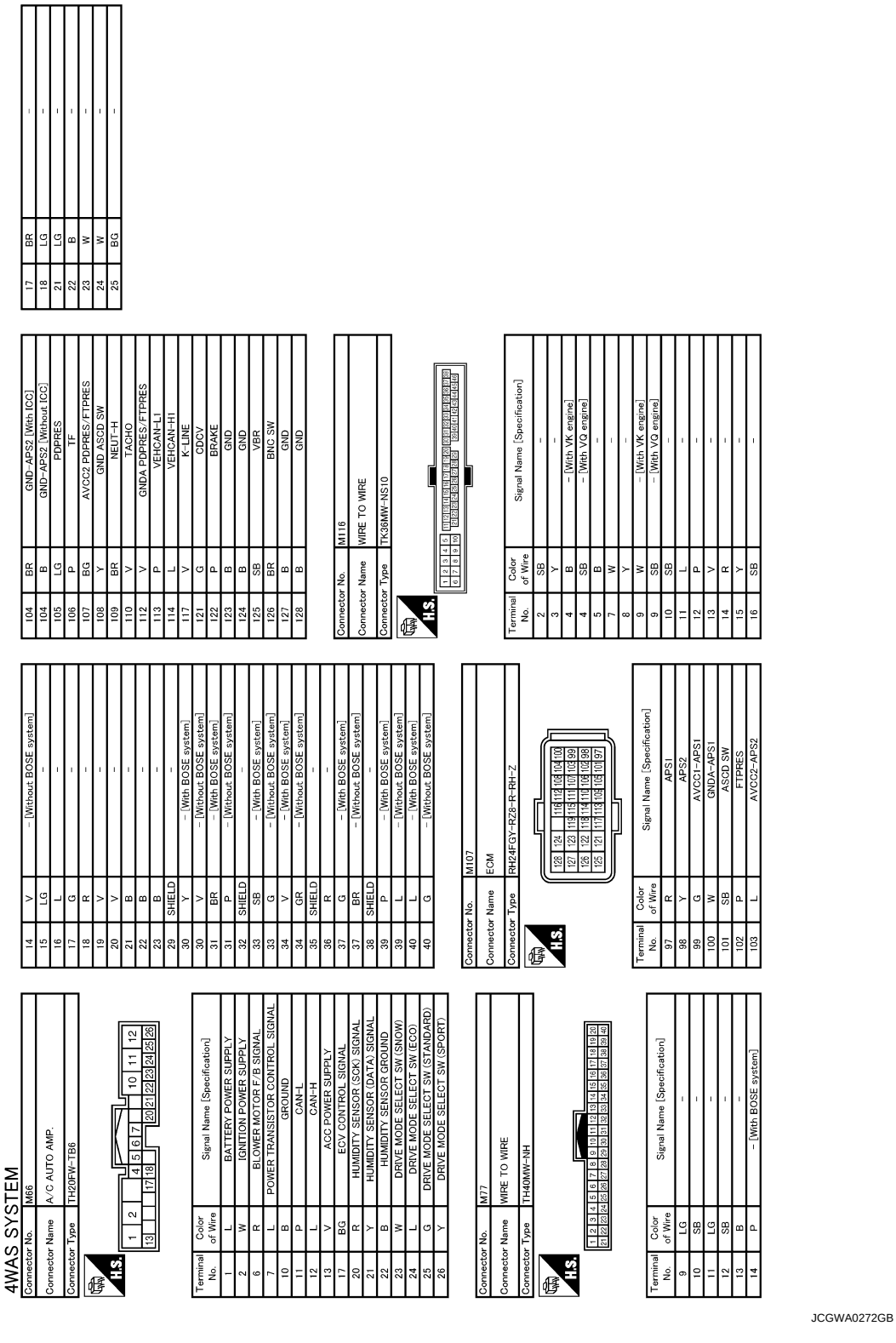

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4WAS SYSTEM

Connector No.	M135
Connector Name	WIRE TO WIRE
Connector Type	TH32FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	–
2	BG	–
5	V	– [With Climate controlled seat]
5	L	– [With heated seat]
6	P	– [With Climate controlled seat]
6	GR	– [With heated seat]
7	SB	–
10	G	– [With Climate controlled seat]
10	GR	– [With heated seat]
11	L	– [With Climate controlled seat]
11	BG	– [With heated seat]
12	Y	–
13	W	–
14	L	–
15	G	–
16	Y	–
17	W	– [With Climate controlled seat]
17	P	– [With heated seat]
18	BR	–
19	GR	–
20	B	–
21	R	– [With Climate controlled seat]
22	W	– [With heated seat]
23	BG	–
24	V	–
25	LG	– [With Climate controlled seat]
25	B	– [With heated seat]
26	SB	– [With Climate controlled seat]
26	R	– [With heated seat]
27	P	– [With Climate controlled seat]
27	B	– [With heated seat]
28	B	–
29	B	–
30	Y	–
32	L	–

Connector No.	M143
Connector Name	YAW RATE / SIDE / DECEL G SENSOR
Connector Type	SAZ06FB

Terminal No.	Color of Wire	Signal Name [Specification]
1	B	GND
2	R	BUS-L
3	L	BUS-H
4	G	12V

Connector No.	M160
Connector Name	ECM
Connector Type	MAB55FB-MEB10-LH

Terminal No.	Color of Wire	Signal Name [Specification]
111	W	FUEL INJECTOR DRIVER POWER SUPPLY
112	W	VIN/J2A
114	B	ECM GROUND
115	B	ECM GROUND
120	G	EVAP CANISTER VENT CONTROL VALVE
122	V	PCSEL ACTUATOR MOTOR RELAY, ASCD/T, LOVEL CONTROL MODULE
123	BG	THROTTLE CONTROL MOTOR RELAY
125	P	FUEL PUMP CONTROL MODULE (FPCM)
126	Y	ACCELERATOR PEDAL POSITION SENSOR 2
128	SB	ASCD STEERING SWITCH
128	SB	ICC STEERING SWITCH
129	BR	SENSOR GROUND [WITH ICC]
129	B	SENSOR GROUND [WITHOUT ICC]
130	Y	SENSOR GROUND
131	L	SENSOR POWER SUPPLY
133	BG	SENSOR POWER SUPPLY
134	P	FUEL TEMPERATURE SENSOR
136	R	ACCELERATOR PEDAL POSITION SENSOR 1
137	G	SENSOR POWER SUPPLY
138	P	BATTERY CURRENT SENSOR
139	BG	BATTERY TEMPERATURE SENSOR
140	W	SENSOR GROUND
141	G	IGNITION SWITCH
142	GR	FUEL PUMP CONTROL MODULE (FPCM) CHECK
143	P	FUEL TANK PRESSURE SENSOR
144	LG	REFRIGERANT PRESSURE SENSOR
146	L	CAN COMMUNICATION LINE
147	BR	ASCD BRAKE SWITCH [WITHOUT ICC]
147	BR	ICC BRAKE SWITCH [WITH ICC]
150	V	SENSOR GROUND
151	P	CAN COMMUNICATION LINE
156	W	POWER SUPPLY FOR ECM (BACK-UP)
158	P	STOP LAMP SWITCH
161	Y	ECM COMMUNICATION LINE
163	W	ECM RELAY (SELF SHUT-OFF)
166	BG	ECM COMMUNICATION LINE
169	V	ENGINE SPEED SIGNAL OUTPUT
171	SB	POWER SUPPLY FOR ECM
172	SB	POWER SUPPLY FOR ECM
173	R	THROTTLE CONTROL MOTOR POWER SUPPLY
174	B	ECM GROUND
175	B	ECM GROUND

Connector No.	M182
Connector Name	DATA LINK CONNECTOR
Connector Type	BD16FW

Terminal No.	Color of Wire	Signal Name [Specification]
3	LG	–
4	B	–
5	B	–
6	L	–
7	V	–
8	LG	–
11	SB	–
12	P	–
13	L	–
14	P	–
16	W	–

Connector No.	M201
Connector Name	WIRE TO WIRE
Connector Type	TH32MW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	–
2	BG	–
5	V	–
6	P	–
7	SB	–
10	G	–
11	L	–
12	R	–
13	W	–
14	L	–
15	G	–
16	Y	–
17	W	–
18	BR	–
19	GR	–
20	B	–
21	R	–
22	B	–
23	BG	–
24	V	–
25	B	–
26	R	– [With Climate controlled seat]
27	B	– [With heated seat]
28	B	–
29	B	–
30	B	–
32	R	–

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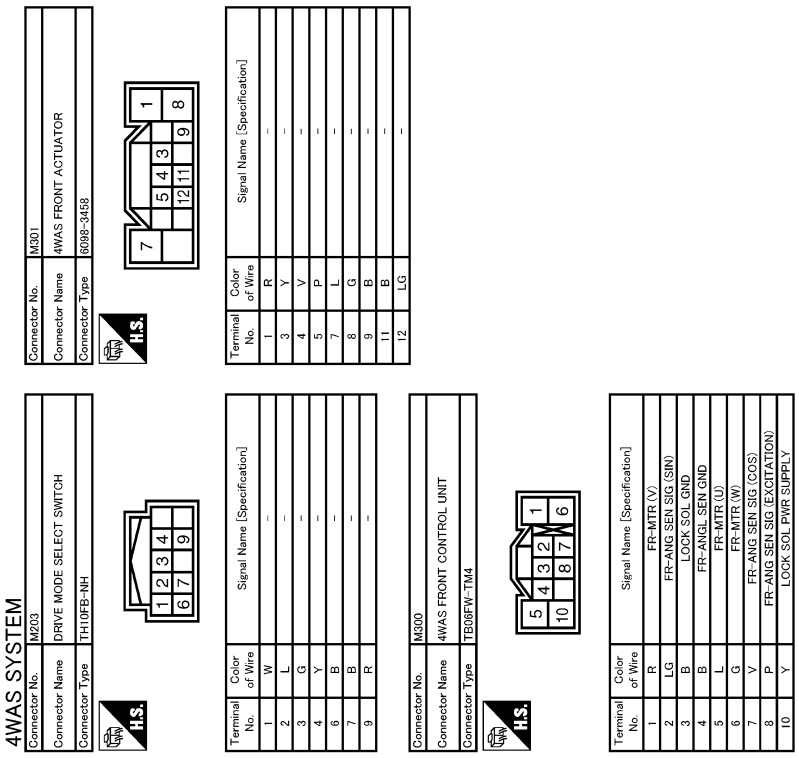


JCGWA0274GB

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000006044947

DETAILED FLOW

1.INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing STC-83, "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-60, "Protection Function (4WAS Front Control Unit)", STC-67, "Protection Function (4WAS Main Control Unit)".

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.CHECK CURRENT STATE

Start the engine.

CAUTION:

Never drive the vehicle.

Does 4WAS warning lamp turn ON?

YES >> GO TO 4.
NO >> GO TO 12.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC except “C1930” or “C1931” detected?

YES >> GO TO 8.
NO >> Record or print self-diagnosis results. GO TO 5.

5.RECHECK SYMPTOM (4WAS FRONT CONTROL UNIT)

With CONSULT-III

1. Turn the ignition switch OFF, and then wait for 10 seconds or more.
2. Perform self-diagnosis for “4WAS(FRONT)”.
3. Record the values of “DATA MONITOR” about each DTC detected when performing self-diagnosis.
4. Record the values of “FREEZE FRAME DATA” about each DTC detected when performing self-diagnosis.
5. Erase self-diagnostic results for “4WAS(FRONT)”.
   CAUTION:
   - **Never erase the self-diagnostic results (records) history when replacing 4WAS front control unit.**
   - **Erase the memory of self-diagnostic results (records) after printing out or recording all the values of “DATA MONITOR”.**
6. 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-61, "DTC Inspection Priority Chart".

- IF DTC is not detected, refer to the recorded values of “FREEZE FRAME DATA”.

Is any DTC detected?

YES >> GO TO 6.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-38, "Intermittent Incident".

6. REPAIR OR REPLACE ERROR-DETECTED PARTS

1. Repair or replace error-detected parts.
   CAUTION:
   Reconnect part or connector after repairing or replacing.
2. When DTC is detected, erase self-diagnostic results for “4WAS(FRONT)”.

>> GO TO 7.

7. RECHECK SYMPTOM (4WAS FRONT CONTROL UNIT)

With CONSULT-III
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-61, "DTC Inspection Priority Chart".
- IF DTC is not detected, refer to the recorded values of “FREEZE FRAME DATA”.

Is any DTC detected?

YES >> GO TO 6.
NO >> GO TO 8.

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

With CONSULT-III
Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is any DTC detected?

YES >> Record or print self-diagnosis results. GO TO 9.
NO >> GO TO 12.

9. RECHECK SYMPTOM (4WAS MAIN CONTROL UNIT)

With CONSULT-III
1. Turn the ignition switch OFF, and then wait for 10 seconds or more.
2. Record the values of “DATA MONITOR” about each DTC detected when performing self-diagnosis.
3. Record the values of “FREEZE FRAME DATA” about each DTC detected when performing self-diagnosis.
4. Erase self-diagnostic results for “4WAS(MAIN)/RAS/HICAS”.
   CAUTION:
   - **Never erase the self-diagnostic results (records) history when replacing 4WAS main control unit.**
   - **Erase the memory of self-diagnostic results (records) after printing out or recording all the values of “DATA MONITOR”.**
5. 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-67, "DTC Inspection Priority Chart".
   - IF DTC is not detected, refer to the recorded values of “FREEZE FRAME DATA”.

Is any DTC detected?

YES >> GO TO 10.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-41, "Circuit Inspection".

10. REPAIR OR REPLACE ERROR-DETECTED PARTS

1. Repair or replace error-detected parts.
   CAUTION:
   Reconnect part or connector after repairing or replacing.
2. When DTC is detected, erase self-diagnostic results for “4WAS(MAIN)/RAS/HICAS”.

>> GO TO 11.

11. RECHECK SYMPTOM (4WAS MAIN CONTROL UNIT)

With CONSULT-III

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-67, "DTC Inspection Priority Chart".
- IF DTC is not detected, refer to the recorded values of “FREEZE FRAME DATA”.

Is any DTC detected?

YES >> GO TO 10.
NO >> GO TO 13.

12. 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?

YES >> GO TO 13.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-38, "Intermittent Incident".

13. FINAL CHECK

With CONSULT-III

1. Check the reference value for 4WAS front control unit and 4WAS main control unit.
2. Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom reproduced?

YES >> GO TO 4.
NO >> INSPECTION END

Diagnostic Work Sheet

INFOID:0000000006044948

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

Interview sheet					
Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Symptom		☐The steering wheel position (center) is in the wrong position.			
		☐4WAS warning lamp turns on.			
		☐Noise ☐Vibration			
		☐Others ( )			
First occurrence		☐Recently ☐Others ( )			
Frequency of occurrence		☐Always ☐Under a certain conditions of ☐Sometimes (time(s)/day)			
Climate conditions		☐Irrelevant			
	Weather	☐Fine ☐Cloud ☐Rain ☐Snow ☐Others ( )			
	Temperature	☐Hot ☐Warm ☐Cool ☐Cold ☐Temperature (Approx. °C)			
	Relative humidity	☐High ☐Moderate ☐Low			

Interview sheet

Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine		Mileage	km (Mile)
Road conditions		☐Urban area ☐Suburb area ☐High way ☐Mounting road (uphill or down hill) ☐Rough road			
Operation conditions, etc.		☐Irrelevant ☐When engine starts ☐During idling ☐During driving ☐During acceleration ☐At constant speed driving ☐During deceleration ☐During cornering (right curve or left curve) ☐During steering			
Other conditions					

Memo

ADDITIONAL SERVICE WHEN REPLACING 4WAS FRONT CONTROL UNIT

Description

INFOID:0000000006044949

When replacing 4WAS front control unit, 4WAS front actuator adjustment is required.

CAUTION:

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

Work Procedure

INFOID:0000000006136316

1.PERFORM 4WAS FRONT ACTUATOR ADJUSTMENT

Perform 4WAS front actuator adjustment.

>> Refer to STC-88, "Work Procedure (Pattern 3)".

ADDITIONAL SERVICE WHEN REPLACING 4WAS MAIN CONTROL UNIT

Description

INFOID:0000000006134048

Before replacing 4WAS main control unit, record the sele-diagnosis results (history).

CAUTION:

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

4WAS FRONT ACTUATOR NEUTRAL POSITION ADJUSTMENT

Description

INFOID:0000000006044950

4WAS front actuator adjustment is required when performing any service below.

- 4WAS front actuator and the steering components (including wheel alignment) removal. Refer to STC-87, "Work Procedure (Pattern 1)".
  CAUTION:
  - **Check the following items before the removal:**
  - **4WAS warning lamp OFF after the engine starts.**
  - **Self-diagnosis of each control unit of 4WAS system (4WAS front control unit/4WAS main control unit) is performed. Check that 4WAS system controlled properly.**
- 4WAS front actuator and the steering components (including wheel alignment) installation. Refer to STC-87, "Work Procedure (Pattern 2)".
- 4WAS front control unit and the steering angle sensor replacement. Refer to STC-88, "Work Procedure (Pattern 3)".
- When driving while misaligning the steering wheel position (center) after installing 4WAS front actuator. Refer to STC-89, "Work Procedure (Pattern 4)".

Work Procedure (Pattern 1)

INFOID:0000000006044951

1. 4WAS FRONT ACTUATOR ADJUSTMENT

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Turn the steering wheel to adjust “ACTR ROTA ANG” of the 4WAS front control unit “DATA MONITOR” so that it falls within the range shown below:

   ACTR ROTA ANG : (–3.5) – (+3.5) deg

3. Turn the ignition switch OFF.
   CAUTION:
   Never touch the steering wheel after turning ignition switch OFF.

>> END

Work Procedure (Pattern 2)

INFOID:0000000006044952

1. 4WAS FRONT ACTUATOR ADJUSTMENT

With CONSULT-III

1. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
2. Steer 30° leftward slowly. Steer 30° rightward and return the steering wheel to the straight-ahead position.
3. Perform the steering angle sensor neutral position adjustment. Refer to BRC-68, "Work Procedure".
4. Turn the ignition switch OFF.

>> GO TO 2.

2. PERFORM ACTIVE TEST (SLOW MODE)

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Select “SLOW MODE” item on “ACTIVE TEST” for “4WAS(FRONT)”.
3. Perform “MODE START” of “ACTIVE TEST”.
4. Steer the steering wheel leftward slowly until the turning stops.
5. Steer the steering wheel rightward slowly until the turning stops.

Is “OK” indicated on both right and left on “SLOW MODE”?

YES >> GO TO 3.
NO >> Refer to STC-89, "Work Procedure (Pattern 4)".

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

With CONSULT-III
Perform self-diagnosis for “4WAS(FRONT)”.
NOTE:
Detect DTC “C1671” when replacing 4WAS front control unit or performing 4WAS front actuator adjustment. DTC “C1671” becomes past record if 4WAS front actuator adjustment is completed normally.

Is any error system detected?

YES >> Check the error system.
NO >> GO TO 4.

4.ERASE ERROR HISTORY

With CONSULT-III
Erase the memory of self-diagnostic result for “4WAS(FRONT)” and “4WAS(MAIN)/RAS/HICAS”.

>> END

Work Procedure (Pattern 3)

INFOID:0000000006044953

1.PERFORM ACTIVE TEST (LOCK OPERATION)

With CONSULT-III
1. Never drive the vehicle to the straight-ahead position.
2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Select “LOCK OPERATION” item on “ACTIVE TEST” for “4WAS(FRONT)”.
4. Perform “RELEASE” of “ACTIVE TEST”.
   CAUTION:
   - **Turn the steering wheel 90°. Check that the front wheels do not move.**
   - **Never turn the steering wheel during “RELEASE”.**
5. Turn the steering wheel to adjust “4WAS STR ANG” of “DATA MONITOR” for “4WAS(FRONT)” so that it falls within the range shown below:

   4WAS STR ANG : (–3.5) – (+3.5) deg

6. Perform “LOCK” item on “ACTIVE TEST” for “4WAS(FRONT)”.
7. Steer 30° leftward slowly. Steer 30° rightward and return the steering wheel to the straight-ahead position.
8. Finish 4WAS front control unit active test.

>> GO TO 2.

2.STEERING ANGLE SENSOR NEUTRAL POSITION ADJUSTMENT

1. Perform the steering angle sensor neutral position adjustment. Refer to BRC-68, "Work Procedure".
2. Turn the ignition switch OFF.

>> GO TO 3.

3.RETURN TO 4WAS FRONT ACTUATOR INITIAL POSITION

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Steer 90° leftward slowly. Then steer 90° rightward.
3. Steer 90° leftward slowly again. Then steer 90° rightward. Return the steering wheel to the straight-ahead position.
4. Stop the vehicle in the straight-ahead position after driving for a period of time. (When engine is running)

>> GO TO 4.

4. CHECK 4WAS FRONT ACTUATOR INSPECTION

With CONSULT-III

1. Check “4WAS STR ANG” item on “DATA MONITOR” for “4WAS(FRONT)”.
   CAUTION:
   Never touch the steering wheel during the service.

   4WAS STR ANG : (–3.5) – (+3.5) deg

2. Turn the ignition switch OFF.

Is the inspection result normal?

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

5. PERFORM ACTIVE TEST (SLOW MODE)

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Select “SLOW MODE” item on “ACTIVE TEST” for “4WAS(FRONT)”.
3. Perform “MODE START” of “ACTIVE TEST”.
4. Steer the steering wheel leftward slowly until the turning stops.
5. Steer the steering wheel rightward slowly until the turning stops.

Is “OK” indicated on both right and left on “SLOW MODE”?

YES >> GO TO 6.
NO >> Refer to STC-89, "Work Procedure (Pattern 4)".

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

With CONSULT-III

Perform self-diagnosis for “4WAS(FRONT)”.

Is any error system detected?

YES >> Check the error system.
NO >> GO TO 7.

7. ERASE ERROR HISTORY

With CONSULT-III

Erase the memory of self-diagnostic result for “4WAS(FRONT)” and “4WAS(MAIN)/RAS/HICAS”.

>> END

Work Procedure (Pattern 4)

INFOID:0000000006044954

1. CHECK 4WAS FRONT ACTUATOR

1. Never drive the vehicle to the straight-ahead position.
2. Remove and install 4WAS front actuator again. Check the installation condition.
3. Check that the steering wheel is neutral.

>> GO TO 2.

2. PERFORM ACTIVE TEST (LOCK OPERATION)

With CONSULT-III

1. Stop the vehicle to the straight-ahead position.
2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Select “LOCK OPERATION” item on “ACTIVE TEST” for “4WAS(FRONT)”.

4. Perform “RELEASE” of “ACTIVE TEST”.
   CAUTION:
   - **Turn the steering wheel 90°. Check that the front wheels do not move.**
   - **Never turn the steering wheel during “RELEASE”.**
5. Turn the steering wheel to adjust “4WAS STR ANG” of “DATA MONITOR” for “4WAS(FRONT)” so that it falls within the range shown below:

   4WAS STR ANG : (–3.5) – (+3.5) deg

6. Perform “LOCK” item on “ACTIVE TEST” for “4WAS(FRONT)”.
7. Finish 4WAS front control unit active test.

>> GO TO 3.

3. STEERING ANGLE SENSOR NEUTRAL POSITION ADJUSTMENT

1. Perform the steering angle sensor neutral position adjustment. Refer to BRC-68, "Work Procedure".
2. Turn the ignition switch OFF.

>> GO TO 4.

4. RETURN TO 4WAS FRONT ACTUATOR INITIAL POSITION

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Steer 90° leftward slowly. Then steer 90° rightward.
3. Steer 90° leftward slowly again. Then steer 90° rightward. Return the steering wheel to the straight-ahead position.
4. Stop the vehicle in the straight-ahead position after driving for a period of time. (Engine running)

>> GO TO 5.

5. CHECK 4WAS FRONT ACTUATOR

With CONSULT-III

1. Check “4WAS STR ANG” item on “DATA MONITOR” for “4WAS(FRONT)”.
   CAUTION:
   Never touch the steering wheel during the service.

   4WAS STR ANG : (–3.5) – (+3.5) deg

2. Turn the ignition switch OFF.

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 1.

6. PERFORM ACTIVE TEST (SLOW MODE)

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Select “SLOW MODE” item on “ACTIVE TEST” for “4WAS(FRONT)”.
3. Perform “MODE START” of “ACTIVE TEST”.
4. Steer the steering wheel leftward slowly until the turning stops.
5. Steer the steering wheel rightward slowly until the turning stops.

Is “OK” indicated on both right and left on “SLOW MODE”?

YES >> GO TO 7.
NO >> GO TO 1.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(FRONT)”.

Is any error system detected?

YES >> Check the error system.
NO >> GO TO 8.

8. ERASE ERROR HISTORY

With CONSULT-III

Erase the memory of self-diagnostic result for “4WAS(FRONT)” and “4WAS(MAIN)/RAS/HICAS”.

>> END

DTC/CIRCUIT DIAGNOSIS

C1621, C1622 4WAS FRONT ACTUATOR

DTC Logic

INFOID:0000000006044955

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1621	ACTUATOR	4WAS front motor current valve error is detected. (4WAS front motor current valve is excessively large.)	4WAS front control unit or 4WAS front motor error is detected.
C1622	ACTUATOR	4WAS front motor voltage valve or current error valve is detected. (4WAS front motor voltage valve error is detected.) (Voltage valve or current valve error is detected when starting the system.)	4WAS front control unit or 4WAS front motor error is detected.

DTC CONFIRMATION PROCEDURE

1. RECHECK DTC

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Steer 360° leftward slowly. Then steer 360° rightward to return the steering wheel to the straight-ahead position. Repeat the same service for 1 minute or more.
   NOTE:
   The protection function mode (overheat protection) activates and the system stops if steering repeats for a long time.
3. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1621” or “C1622” detected?

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

Diagnosis Procedure

INFOID:0000000006044956

1. CHECK 4WAS FRONT MOTOR CIRCUIT

Check 4WAS front motor circuit. Refer to STC-93, "Component Inspection (4WAS Front Motor)".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace 4WAS front actuator. Refer to ST-41, "WITH 4WAS : Removal and Installation".

2. CHECK 4WAS FRONT MOTOR CIRCUIT

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

4WAS front actuator		4WAS front control unit		Continuity
Connector	Terminal	Connector	Terminal	
M301	1	M300	1	Existed
	7		5	
	8		6	

Is the inspection result normal?

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

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

With CONSULT-III

1. Connect 4WAS front actuator harness connector.
2. Connect 4WAS front control unit harness connector.
3. Turn the ignition switch OFF to ON.
4. Perform self-diagnosisfor “4WAS(FRONT)”.

Is DTC “C1621” or “C1622” detected?

YES >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-93, "Special Repair Requirement".

NO >> GO TO 4.

4. CHECK INFORMATION

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-56, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-93, "Special Repair Requirement".

Component Inspection (4WAS Front Motor)

INFOID:0000000006044957

1. CHECK 4WAS FRONT MOTOR

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

4WAS front actuator Terminal		Resistance (Approx.)
1	7	0.1 – 1 Ω
1	8	
7	8	

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

4WAS front actuator Terminal	Continuity
1 – Ground	Not existed
7 – Ground	
8 – Ground	

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace 4WAS front actuator. Refer to ST-41, "WITH 4WAS : Removal and Installation".

Special Repair Requirement

INFOID:0000000006136321

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

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

C1627 4WAS FRONT ACTUATOR

DTC Logic

INFOID:0000000006044959

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1627	ACTUATOR	The indication value from 4WAS front actuator (front wheel angle) differs from the value from 4WAS front control unit.	4WAS front actuator error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Steer 360° leftward slowly. Then steer 360° rightward to return the steering wheel to the straight-ahead position. Repeat the same service for 1 minute or more.
   NOTE:
   The protection function mode (overheat protection) activates and the system stops if steering repeats for a long time.
3. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1627” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-95, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044960

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

With CONSULT-III

Perform self-diagnosis for “4WAS(FRONT)”.

Is any DTC detected other than “C1627”?

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

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

With CONSULT-III

Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1627” detected?

YES >> Replace 4WAS front actuator. Refer to ST-41, "WITH 4WAS : Removal and Installation".
NO >> GO TO 3.

3.CHECK INFORMATION

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-56, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace 4WAS front actuator. Refer to STC-184, "Removal and Installation".

C1628 4WAS FRONT ACTUATOR

DTC Logic

INFOID:0000000006044962

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1628	ACTUATOR	The front wheel steering angle sensor error is detected.	Front wheel steering angle sensor error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Steer 360° leftward slowly. Then steer 360° rightward to return the steering wheel to the straight-ahead position. Repeat the same service for 1 minute or more.
   NOTE:
   The protection function mode (overheat protection) activates and the system stops if steering repeats for a long time.
3. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1628” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-96, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044963

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

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

4WAS front control unit		—	Continuity
Connector	Terminal		
M300	4	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors.

2.CHECK FRONT WHEEL STEERING ANGLE SENSOR CIRCUIT (2)

1. Connect 4WAS front control unit harness connector.
2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Check the continuity between 4WAS front control unit harness connectors.

4WAS front control unit				Continuity
Connector	Terminal	Connector	Terminal	
M300	4	M42	18	Existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".

3.CHECK FRONT WHEEL STEERING ANGLE SENSOR CIRCUIT (3)

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

4WAS front actuator		4WAS front control unit		Continuity
Connector	Terminal	Connector	Terminal	
M301	12	M300	2	Existed
	11		4	
	4		7	
	5		8	

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair replace error-detected parts.

4. CHECK FRONT WHEEL STEERING ANGLE SENSOR SIGNAL

With CONSULT-III

1. Connect 4WAS front actuator harness connector.
2. Connect 4WAS front control unit harness connector.
3. Start the engine.
   CAUTION:
   Never drive the vehicle.
4. Rotate the steering wheel slowly. Check “ACT PATTERN” item on “DATA MONITOR” for “4WAS(FRONT)”.

Does not the value of “DATA MONITOR” change?

YES >> Replace 4WAS front actuator. Refer to ST-41, "WITH 4WAS : Removal and Installation". After replacing, perform DTC confirmation procedure again. When DTC "1628" is detected, Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-97, "Special Repair Requirement".

NO >> Check 4WAS front actuator harness connector pin terminal for disconnection.

Special Repair Requirement

INFOID:0000000006136379

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1631, C1632 4WAS FRONT CONTROL UNIT

DTC Logic

INFOID:0000000006044965

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1631	CONTROL UNIT	An error is detected inside 4WAS front control unit.	4WAS front control unit or 4WAS front control unit power supply error is detected.
C1632	CONTROL UNIT	An error is detected inside 4WAS front control unit.	4WAS front control unit or 4WAS front control unit power supply error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1631” or “C1632” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-98, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044966

1.CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (1)

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M41	11	Ground	Battery voltage

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M41	11	Ground	Battery voltage

Is the inspection result normal?

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

2.CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 40A fusible link (Q).
3. Check the harness for open or short between 4WAS front control unit harness connector No.11 terminal and 40A fusible link (Q).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-11, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

3. CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (3)

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M42	15	Ground	0 V

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M42	15	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4. CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (4)

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

4WAS front control unit		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M42	15	M1	2A	Existed

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

4WAS front control unit		—	Continuity
Connector	Terminal		
M42	15	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-84, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

5. CHECK 4WAS FRONT CONTROL UNIT GROUND

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

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

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace the harnesses and connectors.

6.CHECK TERMINAL

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

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace the error-detected parts.

7.CHECK INFORMATION

- Check that any item below is applicable when the malfunctions occur.
- The engine stall occurs while driving or stopping the vehicle.
- When detecting the charging system error

Is the item applicable?

YES >> Check the error system.
- Perform ECM symptom diagnosis. Refer to EC-524, "Symptom Table" (VQ37VHR), EC-1091, "Symptom Table" (VK56VD).
- Perform the symptom diagnosis for the charging system. Refer to CHG-26, "Symptom Table".

NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-100, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136380

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1633 4WAS FRONT CONTROL UNIT

DTC Logic

INFOID:0000000006044968

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1633	CONTROL UNIT	An error is detected inside 4WAS front control unit.	4WAS front control unit error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1633” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-101, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044969

1.CHECK 4WAS FRONT CONTROL UNIT (1)

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Check “THERM TEMP” on “DATA MONITOR” for “4WAS(FRONT)”.
3. Steer the steering wheel 360° leftward slowly and then steer 360° rightward. Return the steering wheel to the straight-ahead position. Repeat the same service for 3 minutes.
4. Check “THERM TEMP” on “DATA MONITOR” for “4WAS(FRONT)”.

Is DATA MONITOR value difference between before and after the service 3° or less?

YES >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-102, "Special Repair Requirement".

NO >> GO TO 2.

2.CHECK 4WAS FRONT CONTROL UNIT (2)

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Check “THERM TEMP” item on “DATA MONITOR” for “4WAS(FRONT)”.
3. Steer the steering wheel 360° leftward slowly and then steer 360° rightward. Return the steering wheel to the straight-ahead position. Repeat the same service for 3 minutes.
4. Check “THERM TEMP” item on “DATA MONITOR” for “4WAS(FRONT)”.

Monitor item	Condition	Display value
THERM TEMP	Engine running (idling)	(–40) – (+ 100)°C

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-102, "Special Repair Requirement".

3.CHECK INFORMATION

- Check that any item below is applicable when malfunction occurs.
- Entering and exiting the garage (Frequent steering)
- When steering the steering wheel for a long time

Is the item applicable?

YES >> 4WAS system protection function mode (overheat protection)(4WAS system temporary stop)
NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-102, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136381

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1651 IGNITION POWER SUPPLY

Description

INFOID:0000000006044971

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

DTC Logic

INFOID:0000000006044972

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1651	IGN POWER SUPPLY	The ignition voltage signal error is detected.	4WAS front control unit or the ignition power supply error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1651” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-103, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044973

1.CHECK 4WAS FRONT CONTROL UNIT GROUND

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

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors.

2.CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (1)

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M42	15	Ground	0 V

2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Check the voltage between 4WAS front control unit harness connector terminal and ground.

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M42	15	Ground	Battery voltage

Is the measurement value “9 V” or less?

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

3. CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (2)

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

4WAS front control unit		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M42	15	M1	2A	Existed

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

4WAS front control unit		—	Continuity
Connector	Terminal		
M42	15	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-84, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

4. CHECK 4WAS FRONT CONTROL UNIT SIGNAL

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Check “IGN VOLT” item on “DATA MONITOR” for “4WAS(FRONT)”.

Does the item on “DATA MONITOR” indicate “16 V” or more?

YES >> Perform the symptom diagnosis for the charging system. Refer to CHG-26, "Symptom Table".
NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-104, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136382

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1652 4WAS FRONT MOTOR POWER SUPPLY

Description

INFOID:0000000006044975

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

DTC Logic

INFOID:0000000006044976

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1652	MOTOR POWER SUPPLY	4WAS front motor main power supply error is detected	4WAS front control unit or 4WAS front motor power supply error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1652” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-105, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044977

1.CHECK 4WAS FRONT CONTROL UNIT GROUND

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

4WAS front control unit		—	Continuity
Connector	Terminal		
M41	12	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors.

2.CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (1)

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M41	11	Ground	Battery voltage

2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Check the voltage between 4WAS front control unit harness connector terminal and ground.

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M41	11	Ground	Battery voltage

Is the measurement value “9 V” or less?

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

3. CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 40A fusible link (Q).
3. Check the harness for open or short between 4WAS front control unit harness connector No.11 terminal and 40A fusible link (Q).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-11, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

4. 4WAS FRONT CONTROL UNIT SIGNAL INSPECTION

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Check “MOTOR VOLT” item on “DATA MONITOR” for “4WAS(FRONT)”.

Does the item on “DATA MONITOR” indicate “16 V” or more?

YES >> Perform the symptom diagnosis for the charging system. Refer to CHG-26, "Symptom Table".
NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-105, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000006136383

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1654 4WAS FRONT ACTUATOR RELAY

Description

INFOID:0000000006044979

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

DTC Logic

INFOID:0000000006044980

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1654	ACTUATOR RELAY	An error is detected on the main relay power supply inside 4WAS front control unit.	The main relay power supply inside 4WAS front control unit error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1654” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-107, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044981

1.CHECK 4WAS FRONT MOTOR GROUND

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

4WAS front control unit		—	Continuity
Connector	Terminal		
M41	12	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors.

2.CHECK 4WAS FRONT MOTOR POWER SUPPLY (1)

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M41	11	Ground	Battery voltage

2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Check the voltage between 4WAS front control unit harness connector terminal and ground.

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M41	11	Ground	Battery voltage

Is the measurement value “9 V” or less?

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

3.CHECK 4WAS FRONT MOTOR POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 40A fusible link (Q).
3. Check the harness for open or short between 4WAS front control unit harness connector No.11 terminal and 40A fusible link (Q).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-11, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

4.4WAS FRONT CONTROL UNIT SIGNAL INSPECTION

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Check “MOTOR VOLT” item on “DATA MONITOR” for “4WAS(FRONT)”.

Does the item on “DATA MONITOR” indicate “16 V” or more?

YES >> Perform the symptom diagnosis for the charging system. Refer to CHG-26, "Symptom Table".
NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-108, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136384

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1655 4WAS FRONT DRIVER

Description

INFOID:0000000006044983

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

DTC Logic

INFOID:0000000006044984

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1655	PRE-DRIVER	4WAS front motor 3-phase current error is detected. (Current is not applied to 4WAS front motor)	4WAS front control unit or 4WAS front motor power supply error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1655” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-109, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044985

1.CHECK 4WAS FRONT MOTOR GROUND

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

4WAS front control unit		—	Continuity
Connector	Terminal		
M41	12	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors.

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

With CONSULT-III

1. Connect 4WAS front control unit harness connector.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1622” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-92, "Diagnosis Procedure".
NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-109, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136385

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

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

C1661 4WAS FRONT LOCK SOLENOID VALVE

DTC Logic

INFOID:0000000006044987

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1661	LOCK SOLENOID	4WAS front lock solenoid valve error is detected. (An electric activation error is detected.)	4WAS front control unit or 4WAS front lock solenoid valve error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1661” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-111, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044988

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

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

4WAS front control unit			Resistance (Approx.)
Connector	Terminal		
M300	10	3	1 – 100 Ω

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

4WAS front control unit		—	Continuity
Connector	Terminal		
M300	3	Ground	Not existed
	10		

Is the inspection result normal?

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

2.CHECK 4WAS FRONT LOCK SOLENOID VALVE CIRCUIT (2)

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

4WAS front actuator		4WAS front control unit		Continuity
Connector	Terminal	Connector	Terminal	
M301	9	M300	3	Existed
	3		10	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK 4WAS FRONT SOLENOID VALVE

Check 4WAS front solenoid valve. Refer to STC-112, "Component Inspection (4WAS Front Lock Solenoid Valve)".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace 4WAS front actuator. Refer to ST-41, "WITH 4WAS : Removal and Installation".

4.CHECK INFORMATION

With CONSULT-III

1. Connect 4WAS front actuator harness connector.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-112, "Special Repair Requirement".

Component Inspection (4WAS Front Lock Solenoid Valve)

INFOID:0000000006044989

1.CHECK 4WAS FRONT SOLENOID VALVE

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

4WAS front actuator		Resistance (Approx.)
Terminal		
3	9	1 – 100 Ω

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

4WAS front actuator	Continuity
Terminal	
3 – Ground	Not existed
9 – Ground	

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Replace 4WAS front actuator. Refer to ST-41, "WITH 4WAS : Removal and Installation".

Special Repair Requirement

INFOID:0000000006136386

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1667 LOCK INSERTION

Description

INFOID:0000000006044991

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

DTC Logic

INFOID:0000000006044992

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1667	LOCK INSERTION	4WAS front lock solenoid valve (lock) error is detected. (An error is detected in lock condition.)	The inside 4WAS front actuator error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Steer 30° leftward slowly. Steer 30° rightward. Return the steering wheel to the straight-ahead position.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1667” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-113, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044993

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

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Steer 30° leftward slowly. Steer 30° rightward. Return the steering wheel to the straight-ahead position.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON.
5. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1667” detected?

YES >> Replace 4WAS front actuator. Refer to ST-41, "WITH 4WAS : Removal and Installation".
NO >> GO TO 2.

2.CHECK INFORMATION

With CONSULT-III

1. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-56, "Reference Value".
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is each data the standard value?

YES >> GO TO 1.
NO >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-114, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136387

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1668 LOCK HOLDER GAP DETECT

Description

INFOID:0000000006044995

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

DTC Logic

INFOID:0000000006044996

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1668	LOCK HLD GAP DETCT	4WAS front lock solenoid valve (lock) error is detected. (Excessive force is applied to the lock.)	The inside 4WAS front actuator error is detected.

DTC CONFIRMATION PROCEDURE

1. RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1668” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-115, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006044997

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

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Perform self-diagnosis for “4WAS(FRONT)”. Check that DTC “C1668” is detected.
   CAUTION:
   - **Replace 4WAS front actuator when the diagnosis history remains.**
   - **Never repair the malfunctioning part in 4WAS front actuator adjustment without replacing 4WAS front actuator.**

>> Replace 4WAS front actuator. Refer to ST-41, "WITH 4WAS : Removal and Installation".

C1669 INCOMPLETE LOCK RELEASE

Description

INFOID:0000000006044999

- Wiring connected to 4WAS front actuator is integrated with 4WAS front actuator.
- 4WAS front actuator rotates together with steering wheel.
- 4WAS front actuator mainly consists of five components. [4WAS front lock solenoid valve (lock structure), front wheel steering angle sensor, 4WAS front motor, gear shaft, and spiral cable]

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

DTC Logic

INFOID:0000000006045000

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1669	INCOMP LOCK RELEAS	4WAS front actuator error is detected. (An error is detected in unlock condition.)	The power steering oil pressure or the inside 4WAS front actuator error is detected.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1669” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-116, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045001

1.CHECK INFORMATION

Check that any item below is applicable.

- The steering force is heavy when 4WAS warning lamp is ON.
- The power steering system error is detected (oil leakage, belt tension, steering force etc.).

Is the item applicable?

YES >> Check the steering system. Refer to ST-31, "Inspection" and ST-15, "Inspection".
NO >> Replace 4WAS front actuator. Refer to ST-41, "WITH 4WAS : Removal and Installation".

C1671 ACTUATOR ADJUSTMENT NOT PERFORMED

Description

INFOID:0000000006045003

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

DTC Logic

INFOID:0000000006045004

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1671	ACT ADJ NOT PRFRM	4WAS front actuator adjustment is not performed.	4WAS front actuator adjustment is not performed.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1671” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-117, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045005

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

With CONSULT-III

Perform self-diagnosis for “4WAS(FRONT)”.

Is any DTC except “C1671” detected?

YES >> Check the error system. Refer to STC-61, "DTC Index".
NO >> GO TO 2.

2.4WAS FRONT ACTUATOR ADJUSTMENT

With CONSULT-III

1. Perform 4WAS front actuator adjustment. Refer to STC-87, "Work Procedure (Pattern 2)".
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is any DTC detected?

“C1671”>> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-117, "Special Repair Requirement".

Except “C1671”>>Check the error system. Refer to STC-61, "DTC Index".

Special Repair Requirement

INFOID:0000000006136388

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1672 INCOMPLETE ACTUATOR ADJUSTMENT

Description

INFOID:0000000006045007

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

DTC Logic

INFOID:0000000006045008

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1672	INCOMP ACTUATR ADJ	4WAS front actuator adjustment is incomplete.	4WAS front actuator adjustment is incomplete.

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1672” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-118, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045009

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

With CONSULT-III

Perform self-diagnosis for “4WAS(FRONT)”.

Is any DTC except “C1672” detected?

YES >> Check the error system. Refer to STC-61, "DTC Index".
NO >> GO TO 2.

2.ADJUST 4WAS FRONT ACTUATOR

With CONSULT-III

1. Perform 4WAS front actuator adjustment. Refer to STC-87, "Work Procedure (Pattern 2)".
2. Perform 4WAS front control unit self-diagnosis.

Is any error system detected?

YES >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-118, "Special Repair Requirement".
- Perform 4WAS actuator adjustment after replacing 4WAS front control unit. Perform the 4WAS front control unit self-diagnosis again. Replace 4WAS front actuator if DTC “C1672” is detected. Refer to ST-41, "WITH 4WAS : Removal and Installation".

NO >> INSPECTION END

Special Repair Requirement

INFOID:0000000006136389

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1684, C1685 4WAS MAIN CONTROL UNIT COMMUNICATION

Description

INFOID:0000000006045011

- 4WAS front control unit and 4WAS main control unit transmit/receive information to/from each other for optimum control of the 4WAS system with the specified 4WAS system line (4WAS communication line) between 4WAS front control unit and 4WAS main control unit.
- Be careful to repair wirings because 4WAS system specified line adopts twisted-pair wires. Refer to STC-33, "Precautions for Harness Repair".

DTC Logic

INFOID:0000000006045012

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1684	4WAS MAIN ECU COMM	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS main control unit.)	4WAS communication line*/4WAS main control unit/4WAS front control unit error
C1685	4WAS MAIN ECU COMM	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS main control unit.)	4WAS communication line*/4WAS main control unit/4WAS front control unit error

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

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1684” or “C1685” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-119, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045013

1.CHECK COMMUNICATION LINE (1)

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

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector	Terminal	
E41	6	M143	2	Existed
	16		3	

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

2.CHECK COMMUNICATION LINE (2)

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E41	6	Ground	Not existed
	16		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

3.CHECK COMMUNICATION LINE (3)

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

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal		
E41	6	16	Not existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

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

Check the ABS actuator and electric unit (control unit) connector. Refer to STC-121, "Component Inspection [ABS Actuator and Electric Unit (Control Unit)]".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-141, "Removal and Installation".

5.CHECK YAW RATE/SIDE/DECEL G SENSOR

Check the between yaw rate/side/decel G sensor connector. Refer to STC-122, "Component Inspection (Yaw Rate/Side/Decel G Sensor)".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Replace yaw rate/side G sensor. Refer to BRC-143, "Removal and Installation".

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

With CONSULT-III

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect yaw rate/side/decel G sensor harness connector.
3. Connect 4WAS front control unit harness connector.
4. Connect 4WAS main control unit harness connector.
5. Start the engine.
   CAUTION:
   Never drive the vehicle.
6. Perform CAN diagnosis support monitor for “4WAS(FRONT)”.
7. Check error history between 4WAS front control unit and 4WAS main control unit. Refer to STC-48, "CONSULT-III Function [4WAS(FRONT)]".

What is the indicated item?

All items are “OK”>>GO TO 7.
“TRANSMIT DIAG” is except “OK”>>GO TO 7.
“4WAS(MAIN)” is except “OK”>>GO TO 8.

7.CHECK 4WAS FRONT CONTROL UNIT CIRCUIT

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

4WAS front control unit		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
M42	14	E41	6	Existed
	25		16	

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

Is the inspection result normal?

YES >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-122, "Special Repair Requirement".

NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

8. CHECK 4WAS MAIN CONTROL UNIT CIRCUIT

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

4WAS main control unit		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
B54	31	E41	16	Existed
	32		6	

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

Is the inspection result normal?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-122, "Special Repair Requirement".

NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

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

INFOID:0000000006045014

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

1. Turn the ignition switch OFF.
2. Remove ABS actuator and electric unit (control unit). Refer toBRC-141, "Removal and Installation".
3. Check the resistance between ABS actuator and electric unit (control unit) connector terminals.

ABS actuator and electric unit (control unit)	Resistance (Approx.)
Terminal	
16 – 6	120 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ABS actuator and electric unit (control unit). Refer toBRC-141, "Removal and Installation".

Component Inspection (Yaw Rate/Side/Decel G Sensor)

INFOID:0000000006045015

1.CHECK YAW RATE/SIDE/DECEL G SENSOR

1. Turn the ignition switch OFF.
2. Remove yaw rate/side/decel G sensor. Refer to BRC-143, "Removal and Installation".
3. Check the resistance between yaw rate/side/decel G sensor connector terminals.

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace yaw rate/side/decel G sensor. Refer to BRC-143, "Removal and Installation".

Special Repair Requirement

INFOID:0000000006136390

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

C1686 4WAS MAIN CONTROL UNIT

DTC Logic

INFOID:0000000006045017

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1686	4WAS MAIN ECU	An error is detected on 4WAS main control unit side. (4WAS main control unit fail-safe mode)	4WAS main control unit fail-safe mode

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “C1686” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-123, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045018

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

With CONSULT-III

Perform self-diagnosis for “4WAS(FRONT)”.

Is any DTC other than “C1686” detected?

YES >> Check the error system. Refer to STC-61, "DTC Index".
NO >> Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”. Refer to STC-53, "CONSULT-III Function [4WAS(MAIN)/RAS/HICAS]".

U1000, U1002 4WAS COMMUNICATION CIRCUIT

Description

INFOID:0000000006045019

- 4WAS front control unit and 4WAS main control unit transmit/receive information to/from each other for optimum control of the 4WAS system with the specified 4WAS system line (4WAS communication line) between 4WAS front control unit and 4WAS main control unit.
- Be careful to repair wirings because 4WAS system specified line adopts twisted-pair wires. Refer to STC-33, "Precautions for Harness Repair".

DTC Logic

INFOID:0000000006045020

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	When 4WAS front control unit is not transmitting or receiving 4WAS communication signal for 2 seconds or more.	4WAS communication line*/4WAS main control unit/4WAS front control unit error
U1002	SYSTEM COMM(CAN)	When 4WAS front control unit is not transmitting or receiving 4WAS communication signal for 2 seconds or less.	4WAS communication line*/4WAS main control unit/4WAS front control unit error

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

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “U1000” or “U1002” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-124, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045021

1.CHECK COMMUNICATION LINE (1)

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

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector	Terminal	
E41	6	M143	2	Existed
	16		3	

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

2.CHECK COMMUNICATION LINE (2)

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E41	6	Ground	Not existed
	16		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

3.CHECK COMMUNICATION LINE (3)

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

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal		
E41	6	16	Not existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

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

Check the ABS actuator and electric unit (control unit) connector. Refer to STC-126, "Component Inspection [ABS Actuator and Eletric Unit (Control Unit)]".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-141, "Removal and Installation".

5.CHECK YAW RATE/SIDE/DECEL G SENSOR

Check the between yaw rate/side/decel G sensor connector. Refer to STC-127, "Component Inspection (Yaw Rate/Side/Decel G Sensor)".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Replace yaw rate/side G sensor. Refer to BRC-143, "Removal and Installation".

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

With CONSULT-III

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect yaw rate/side/decel G sensor harness connector.
3. Connect 4WAS front control unit harness connector.
4. Connect 4WAS main control unit harness connector.
5. Start the engine.
   CAUTION:
   Never drive the vehicle.
6. Perform CAN diagnosis support monitor for “4WAS(FRONT)”.
7. Check error history between 4WAS front control unit and 4WAS main control unit. Refer to STC-48, "CONSULT-III Function [4WAS(FRONT)]".

What is the indicated item?

All items are “OK”>>GO TO 7.
“TRANSMIT DIAG” is except “OK”>>GO TO 7.
“4WAS(MAIN)” is except “OK”>>GO TO 8.

7.CHECK 4WAS FRONT CONTROL UNIT CIRCUIT

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

4WAS front control unit		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
M42	14	E41	6	Existed
	25		16	

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

Is the inspection result normal?

YES >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-127, "Special Repair Requirement".

NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

8. CHECK 4WAS MAIN CONTROL UNIT CIRCUIT

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

4WAS main control unit		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
B54	31	E41	16	Existed
	32		6	

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

Is the inspection result normal?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-127, "Special Repair Requirement".

NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

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

INFOID:0000000006045022

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

1. Turn the ignition switch OFF.
2. Remove ABS actuator and electric unit (control unit). Refer toBRC-141, "Removal and Installation".
3. Check the resistance between ABS actuator and electric unit (control unit) connector terminals.

ABS actuator and electric unit (control unit)	Resistance (Approx.)
Terminal	
16 – 6	120 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-141, "Removal and Installation".

Component Inspection (Yaw Rate/Side/Decel G Sensor)

INFOID:0000000006045023

1. CHECK YAW RATE/SIDE/DECEL G SENSOR

1. Turn the ignition switch OFF.
2. Remove yaw rate/side/decel G sensor. Refer to BRC-143, "Removal and Installation".
3. Check the resistance between yaw rate/side/decel G sensor connector terminals.

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace yaw rate/side/decel G sensor. Refer to BRC-143, "Removal and Installation".

Special Repair Requirement

INFOID:0000000006136391

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

U1010 4WAS COMMUNICATION CIRCUIT

Description

INFOID:0000000006045025

- 4WAS front control unit and 4WAS main control unit transmit/receive information to/from each other for optimum control of the 4WAS system with the specified 4WAS system line (4WAS communication line) between 4WAS front control unit and 4WAS main control unit.
- Be careful to repair wirings because 4WAS system specified line adopts twisted-pair wires. Refer to STC-33, "Precautions for Harness Repair".

DTC Logic

INFOID:0000000006045026

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
U1010	CONTROL UNIT(CAN)	When detecting error during the initial diagnosis of 4WAS controller of 4WAS front control unit	4WAS front control unit error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(FRONT)”.

Is DTC “U1010” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-128, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045027

1.4WAS FRONT CONTROL UNIT

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

Is the inspection result normal?

YES >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-128, "Special Repair Requirement".

NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

Special Repair Requirement

INFOID:0000000006136392

Before replacing 4WAS front control unit, record the self-diagnosis results (history).

CAUTION:

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

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

DTC Logic

INFOID:0000000006045029

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1900	CONTROL UNIT [ABNORMAL1]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1901	CONTROL UNIT [ABNORMAL2]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1906	CONTROL UNIT [ABNORMAL5]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1907	CONTROL UNIT [ABNORMAL4]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1927	CONTROL UNIT [ABNORMAL5]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1933	CONTROL UNIT	An error is detected inside 4WAS main control unit.	4WAS main control unit error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1900”, “C1901”, “C1906”, “C1907”, “C1927” or “C1933” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-129, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045030

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is any DTC “C1900”, “C1901”, “C1906”, “C1907”, “C1927” or “C1933” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-129, "Special Repair Requirement".

NO >> GO TO 2.

2.CHECK INFORMATION

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-129, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136324

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

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

Description

INFOID:0000000006045032

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

DTC Logic

INFOID:0000000006045033

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1902	MOTOR OUTPUT [REV CURRENT]	4WAS rear motor current error is detected. (4WAS rear motor current output direction differs.)	4WAS rear motor error
C1903	MOTOR OUTPUT [NO CURRENT]	4WAS rear motor current error is detected. (Current is input to 4WAS main control unit if 4WAS main control unit output is “OFF”.)	4WAS rear motor error
C1904	MOTOR OUTPUT [OVERCURRENT]	4WAS rear motor current error is detected. (4WAS rear motor output is overcurrent.)	4WAS rear motor error
C1910	MOTOR OUTPUT [MOTOR LOCK]	4WAS rear motor inside error is detected. (4WAS rear motor does not move or the rear wheel angle sensor does not change if 4WAS main control unit output is 14 A or more.)	4WAS rear motor error
C1913	MOTOR OUTPUT [ABNORML SIG]	4WAS rear motor current error is detected. (4WAS rear motor does not move or the rear wheel angle sensor output does not change when 4WAS main control unit output is 18 A or more, and 4WAS main motor output is low.)	4WAS rear motor error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Perform “SELF DIAGNOSTIC MODE” item on “ACTIVE TEST” for “4WAS(MAIN)/RAS/HICAS”.
   CAUTION:
   Perform the active test while stopping the vehicle.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1902”, “C1903”, “C1904”, “C1910” or “C1913” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-131, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045034

1.CHECK 4WAS REAR MOTOR CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect 4WAS main control unit harness connector.
3. Disconnect 4WAS rear motor harness connector.
4. Check the continuity between 4WAS main control unit harness connector and 4WAS rear motor harness connector.

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors.

2.CHECK 4WAS REAR MOTOR

Check the continuity between 4WAS rear motor connector terminals. Refer to STC-132, "Component Inspection (4WAS Rear Motor)".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

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

With CONSULT-III

1. Connect 4WAS main control unit harness connector.
2. Connect 4WAS rear motor harness connector.
3. Perform “SELF DIAGNOSTIC MODE” item on “ACTIVE TEST” for “4WAS(MAIN)/RAS/HICAS”.
   CAUTION:
   Perform the active test while vehicle is stopped.
4. Check “MOTOR VOLTAGE”, “MOTOR CURRENT” and “MTR CRNT OPE” while performing the active test.

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

Is “MONITOR” the standard value?

YES >> GO TO 4.
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

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

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-133, "Special Repair Requirement".

NO >> GO TO 5.

5.CHECK INFORMATION

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-133, "Special Repair Requirement".

Component Inspection (4WAS Rear Motor)

INFOID:0000000006045035

1.CHECK 4WAS REAR MOTOR

1. Turn the ignition switch OFF.
2. Disconnect 4WAS rear motor harness connector.
3. Check the continuity between 4WAS rear motor connector terminals.

4WAS rear motor	Continuity
Terminal	
1 – 2	Existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

Special Repair Requirement

INFOID:0000000006136393

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

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

DTC Logic

INFOID:0000000006045037

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1905	CONTROL UNIT [ABNORMAL3]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1908	CONTROL UNIT [ABNORMAL7]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1922	CONTROL UNIT [ABNORMAL8]	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1925	AD CONVERTER	An error is detected inside 4WAS main control unit.	4WAS main control unit error
C1928	CONTROL UNIT [ABNORMAL9]	An error is detected inside 4WAS main control unit.	4WAS main control unit error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

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

YES >> Proceed to diagnosis procedure. Refer to STC-134, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045038

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

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

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-134, "Special Repair Requirement".

NO >> GO TO 2.

2.CHECK INFORMATION

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-134, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136394

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

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

C1909 4WAS MAIN CONTROL UNIT

DTC Logic

INFOID:0000000006045040

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1909	CONTROL UNIT [ABNORMAL6]	An error is detected inside 4WAS main control unit.	4WAS main control unit

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1909” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-136, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045041

1.CHECK 4WAS MAIN CONTROL UNIT GROUND

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

4WAS main control unit		—	Continuity
Connector	Terminal		
B54	34	Ground	Existed
	40		

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors.

2.CHECK 4WAS MAIN CONTROL UNIT POWER SUPPLY (1)

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

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

2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Check the voltage between 4WAS main control unit harness connector terminal and ground.

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

Is the inspection result normal?

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

3. CHECK 4WAS MAIN CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#46).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between 4WAS main control unit harness connector and IPDM E/R harness connector.

4WAS main control unit		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
B54	27	E5	12	Existed

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

4WAS main control unit		—	Continuity
Connector	Terminal		
B54	27	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-84, "Wiring Diagram - IGNITION POWER SUPPLY -".

NO >> Repair or replace error-detected parts.

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

With CONSULT-III

1. Connect 4WAS main control unit harness connector.
2. Connect IPDM E/R harness connector.
3. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1909” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-137, "Special Repair Requirement".

NO >> GO TO 5.

5. CHECK INFORMATION

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

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

NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-137, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136395

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

C1911, C1912 4WAS REAR MOTOR POWER SUPPLY

Description

INFOID:0000000006045043

The power supply for 4WAS rear motor.

DTC Logic

INFOID:0000000006045044

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1911	MOTOR VOLTAGE [LOW VOLTAGE]	4WAS rear motor voltage error is detected. (4WAS rear motor voltage is low.)	4WAS rear motor power supply error
C1912	MOTOR VOLTAGE [BAD OBSTRCT]	4WAS rear motor voltage error is detected. (Voltage is applied to 4WAS main motor when 4WAS main control unit output is “OFF”.)	4WAS rear motor power supply error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

1. Turn the ignition switch from OFF to ON.
   CAUTION:
   Never drive the vehicle. Wait 15 minutes or more.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1911” or “C1912” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-138, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045045

1.CHECK 4WAS MAIN CONTROL UNIT GROUND

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

4WAS main control unit		—	Continuity
Connector	Terminal		
B54	34	Ground	Existed
	40		

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors.

2.CHECK 4WAS MAIN CONTROL UNIT POWER SUPPLY (1)

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

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

2. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
3. Check the voltage between 4WAS main control unit harness connector terminal and ground.

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

Is the inspection result normal?

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

3. CHECK 4WAS MAIN CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#46).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between 4WAS main control unit harness connector and IPDM E/R harness connector.

4WAS main control unit		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
B54	27	E5	12	Existed

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

4WAS main control unit		—	Continuity
Connector	Terminal		
B54	27	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-84, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

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

1. Remove 4WAS rear motor relay.
2. Check the continuity between 4WAS rear motor relay harness connector and ground.

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

3. Check the continuity between 4WAS main control unit harness connector and IPDM E/R harness connector.

4WAS rear motor relay		4WAS main control unit		Continuity
Connector	Terminal	Connector	Terminal	
B53	1	B54	25	Existed

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

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

1. Check 20A fusible link (#37).
2. Check the harness for open or short between 4WAS front control unit harness connector No.3 terminal and 20A fusible link (#37).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

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

1. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
2. Check the voltage between 4WAS main control unit harness connectors and the ground.

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

3. Turn the ignition switch OFF.

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-141, "Special Repair Requirement".

7.CHECK 4WAS REAR MOTOR RELAY

Check 4WAS rear motor relay. Refer to STC-141, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.
NO >> Replace 4WAS rear motor relay.

8.CHECK 4WAS REAR MOTOR POWER SUPPLY

1. Connect 4WAS main control unit harness connector.
2. Install 4WAS rear motor relay.
3. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
4. Check the voltage between 4WAS main control unit harness connectors and the ground.

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

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-141, "Special Repair Requirement".

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

With CONSULT-III
Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1911” or “C1912” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-141, "Special Repair Requirement".

NO >> GO TO 10.

10.CHECK INFORMATION

With CONSULT-III
Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-141, "Special Repair Requirement".

Component Inspection

INFOID:0000000006045046

1. CHECK 4WAS REAR MOTOR RELAY

1. Turn the ignition switch OFF.
2. Remove 4WAS rear motor relay connector.
3. Apply 12 V to 4WAS rear motor relay connector No. 1 terminal and No. 2 terminal.
   CAUTION:
   - **Never make the terminals short.**
   - **Connect the fuse between the terminals when applying the voltage.**
4. Check the continuity between 4WAS rear motor relay connector terminals.

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

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace 4WAS rear motor relay.

Special Repair Requirement

INFOID:0000000006136396

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

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

C1914 REAR WHEEL STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000006045048

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1914	RR ST ANGLE SENSOR [ABNORML VOL]	The rear wheel angle sensor power supply error is detected.	Rear wheel steering sensor power supply error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1914” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-142, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045049

1.CHECK REAR WHEEL STEERING ANGLE SENSOR POWER SUPPLY

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

4WAS main control unit		—	Value (Approx.)
Connector	Terminal		
B54	5	Ground	0 V

3. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
4. Check the voltage between 4WAS main control unit harness connector terminal and the ground.

4WAS main control unit		—	Value (Approx.)
Connector	Terminal		
B54	5	Ground	5 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-143, "Special Repair Requirement".

2.CHECK REAR WHEEL STEERING ANGLE SENSOR

Check the resistance between the rear wheel steering angle sensor connector terminals. Refer to STC-143, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

3.CHECK REAR WHEEL STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

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

4WAS main control unit		Rear wheel steering angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
B54	5	B38	1	Existed
B54	5	B38	4	Not existed
B54	15	B38	4	Existed
B54	15	B38	1	Not existed

Is the inspection result normal?

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

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

With CONSULT-III

1. Connect 4WAS main control unit harness connector.
2. Connect the rear wheel steering angle sensor harness connector.
3. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1914” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-143, "Special Repair Requirement".

NO >> GO TO 5.

5. CHECK INFORMATION

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-143, "Special Repair Requirement".

Component Inspection

INFOID:0000000006045050

1. CHECK REAR WHEEL STEERING ANGLE SENSOR

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

Special Repair Requirement

INFOID:0000000006136399

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

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

C1915, C1916 REAR WHEEL STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000006045052

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1915	RR ST ANGLE SENSOR [MAIN SIGNAL]	The rear wheel angle sensor signal (main) error is detected.	Rear wheel steering sensor output voltage error
C1916	RR ST ANGLE SENSOR [SUB SIGNAL]	If the rear wheel angle sensor signal (sub) error is detected.	Rear wheel steering sensor output voltage error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1915” or “C1916” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-145, "Diagnosis Procedure".
NO >> INSPECTION END

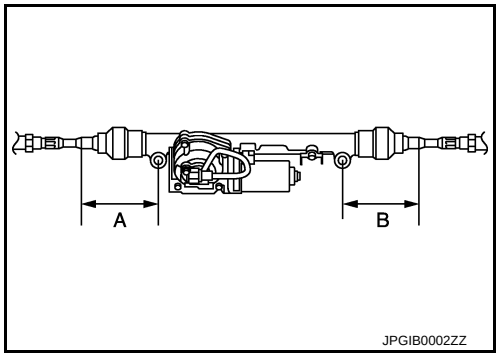
Diagnosis Procedure

INFOID:0000000006045053

1.CHECK 4WAS REAR ACTUATOR

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

CAUTION:
Measure it on the level ground or in the condition that left and right wheel are lifted up.



Is the differential of “A” and “B” 5.4 mm (0.213 in) or less?

YES >> GO TO 2.
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

2.CHECK REAR WHEEL STEERING ANGLE SENSOR (1)

With CONSULT-III

1. Start engine.

CAUTION:
Check condition with the vehicle stopped.

2. Check DATA MONITOR “RR ST ANG-MAI” and “RR ST ANG-SUB” value of 4WAS main control unit.

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

3.CHECK REAR WHEEL STEERING ANGLE SENSOR (2)

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

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

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

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-147, "Special Repair Requirement".

NO >> GO TO 4.

4. CHECK REAR WHEEL STEERING ANGLE SENSOR (3)

Check the resistance between rear wheel steering angle sensor connector terminals. Refer to STC-147, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

5. CHECK REAR WHEEL STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

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

4WAS main control unit		Rear wheel steering angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
B54	4	B38	1, 2, 4	Not existed
	4		3	Existed
	7		1, 3, 4	Not existed
	7		2	Existed
	5		1	Existed
	5		2, 3, 4	Not existed
	15		1, 2, 3	Not existed
	15		4	Existed

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace each harness and connector.

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

With CONSULT-III

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

Is DTC “C1915” or “C1916” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-147, "Special Repair Requirement".

NO >> GO TO 7.

7. CHECK INFORMATION

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data standard?

YES >> Check pin terminal and connection of each harness connector for non-standard conditions.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-147, "Special Repair Requirement".

Component Inspection

INFOID:0000000006045054

1. CHECK REAR WHEEL STEERING ANGLE SENSOR

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

Special Repair Requirement

INFOID:0000000006136400

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

C1917, C1918 REAR WHEEL STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000006045056

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1917	RR ST ANGLE SENSOR [OFFSET SIG1]	The rear wheel angle sensor signal (main and sub) error is detected. (The output signal value differs temporarily between main and sub.)	Rear wheel steering sensor (main and sub) output signal value error signal
C1918	RR ST ANGLE SENSOR [OFFSET SIG2]	The rear wheel angle sensor signal (main and sub) error is detected. (The output signal value differs between main and sub.)	Rear wheel steering sensor (main and sub) output signal error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Select “SELF DIAGNOSTIC MODE” item on “ACTIVE TEST” for “4WAS(MAIN)/RAS/HICAS”.
3. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1917” or “C1918” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-148, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045057

1.CHECK REAR WHEEL STEERING ANGLE SENSOR (1)

With CONSULT-III

1. Start engine.
   CAUTION:
   Check the condition with the vehicle stopped.
2. Check “RR ST ANG-MAI” and “RR ST ANG-SUB” item on “DATA MONITOR” for “4WAS(MAIN)/RAS/HICAS”.

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

2.CHECK REAR WHEEL STEERING ANGLE SENSOR (2)

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

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

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

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".

- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-150, "Special Repair Requirement".

NO >> GO TO 3.

3.CHECK REAR WHEEL STEERING ANGLE SENSOR (3)

Check the resistance between rear wheel steering angle sensor connector terminals. Refer to STC-149, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

4.CHECK REAR WHEEL STEERING ANGLE SENSOR GROUND CIRCUIT

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

4WAS main control unit		Rear wheel steering angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
B54	4	B38	1, 2, 4	Not existed
	4		3	Existed
	7		1, 3, 4	Not existed
	7		2	Existed
	5		1	Existed
	5		2, 3, 4	Not existed
	15		1, 2, 3	Not existed
	15		4	Existed

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace each harness and connector.

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

With CONSULT-III

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

Is DTC “C1917” or “C1918” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-150, "Special Repair Requirement".

NO >> GO TO 6.

6.CHECK INFORMATION

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data standard?

YES >> Check the pin terminal and connection of each harness connector for non-standard conditions.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-150, "Special Repair Requirement".

Component Inspection

INFOID:0000000006045058

1.CHECK REAR WHEEL STEERING ANGLE SENSOR

1. Turn the ignition switch OFF.

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace 4WAS rear actuator. Refer to STC-187, "Removal and Installation".

Special Repair Requirement

INFOID:0000000006136401

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

C1919 VEHICLE SPEED SIGNAL

DTC Logic

INFOID:0000000006045060

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1919	VEHICLE SPEED SEN [NO SIGNAL]	Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) via CAN communication. (Improper signal inputs while driving.)	Vehicle speed signal error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1919” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-151, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045061

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

With CONSULT-III

Perform self-diagnosis for “ABS”.

Is any error system detected?

YES >> Check the error system. Refer to BRC-52, "DTC Index".
NO >> GO TO 2.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “U1000” or “U1010” detected?

YES >> Check the error system. Refer to STC-168, "Diagnosis Procedure" (U1000), STC-169, "Diagnosis Procedure" (U1010).
NO >> GO TO 3.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1919” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-152, "Special Repair Requirement".

NO >> GO TO 4.

4.INFORMATION CHECK

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".

- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-152, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136402

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

C1920 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000006045063

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1920	STEERING ANGLE SEN [NO SIGNAL]	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. (No transmission from the steering angle sensor)	Steering angle sensor input signal error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1920” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-153, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045064

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

With CONSULT-III

Perform self-diagnosis for “ABS”.

Is any error system detected?

YES >> Check the error system. Refer to BRC-52, "DTC Index".
NO >> GO TO 2.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “U1000” or “U1010” detected?

YES >> Check the error system. Refer to STC-168, "Diagnosis Procedure" (U1000), STC-169, "Diagnosis Procedure" (U1010).
NO >> GO TO 3.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1920” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-154, "Special Repair Requirement".

NO >> GO TO 4.

4.INFORMATION CHECK

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".

- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-154, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136403

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

C1921 ENGINE SPEED SIGNAL

DTC Logic

INFOID:0000000006045066

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1921	ENG REV SIGNAL	Malfunction is detected in engine speed signal that is output from ECM via CAN communication. (Improper signal is input engine speed.)	Engine speed signal error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1921” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-155, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045067

1.PERFORM ECM SELF-DIAGNOSIS

With CONSULT-III

Perform self-diagnosis for “ENGINE”.

Is any error system detected?

YES >> Check the error system. Refer to EC-102, "DTC Index" (VQ37VHR), EC-639, "DTC Index" (VK56VD).
NO >> GO TO 2.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “U1000” or “U1010” detected?

YES >> Check the error system. Refer to STC-168, "Diagnosis Procedure" (U1000), STC-169, "Diagnosis Procedure" (U1010).
NO >> GO TO 3.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1921” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-156, "Special Repair Requirement".

NO >> GO TO 4.

4.INFORMATION CHECK

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".

- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-156, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136404

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

C1923 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000006045069

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1923	STEERING ANGLE SEN [NO CHANGE]	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. [Steering angle sensor input signal error is detected when driving at 60 km/h (37MPH) or more.]	Steering angle sensor input signal error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Drive at 60 km/h (38MPH) or more for 3 minutes or more.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS.

Is DTC “C1923” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-157, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045070

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

With CONSULT-III

Perform self-diagnosis for “ABS”.

Is any error system detected?

YES >> Check the error system. Refer to BRC-52, "DTC Index".
NO >> GO TO 2.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “U1000” or “U1010” detected?

YES >> Check the error system. Refer to STC-168, "Diagnosis Procedure" (U1000), STC-169, "Diagnosis Procedure" (U1010).
NO >> GO TO 3.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1923” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-158, "Special Repair Requirement".

NO >> GO TO 4.

4.INFORMATION CHECK

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".

- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-158, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136405

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

C1924 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000006045072

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1924	STEERING ANGLE SEN [NO NEUT STATE]	Driving continuously at 10 km (6 mile) or more while the steering angle sensor value is not L10° - R10°. (Not detected in 4WAS front control unit fail-safe mode)	Steering angle sensor input signal error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Drive continuously for 10 km (6 mile) or more.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1924” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-159, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045073

1.CHECK DRIVING

Drive for a short time.

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

YES >> GO TO 2.
NO >> Adjust the wheel alignment. Refer to FSU-8, "Inspection".

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

With CONSULT-III

Perform self-diagnosis for “ABS”.

Is any error system detected?

YES >> Check the error system. Refer to BRC-52, "DTC Index".
NO >> GO TO 3.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “U1000” or “U1010” detected?

YES >> Check the error system. Refer to STC-168, "Diagnosis Procedure" (U1000), STC-169, "Diagnosis Procedure" (U1010).
NO >> GO TO 4.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1924” detected?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-160, "Special Repair Requirement".

NO >> GO TO 5.

5.INFORMATION CHECK

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-160, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136407

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

C1926, C1932 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000006045075

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1926	STEERING ANGLE SEN	Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. (When improper signal inputs to steering angle sensor and steering angle sensor itself detects the malfunction)	Steering angle sensor error
C1932	STEERING ANGLE SEN	If the steering angle sensor error is detected. (Steering angle sensor output value is abnormal.)	Steering angle sensor input signal error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Turn the steering wheel leftward slowly. Steer until the turning stops.
3. Turn the steering wheel rightward slowly. Steer to the straight-forward position.
4. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1926” or “C1932” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-161, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045076

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

With CONSULT-III

Perform self-diagnosis for “ABS”.

Is any error system detected?

YES >> Check the error system. Refer to BRC-52, "DTC Index".
NO >> GO TO 2.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “U1000” or “U1010” detected?

YES >> Check the error system. Refer to STC-168, "Diagnosis Procedure" (U1000), STC-169, "Diagnosis Procedure" (U1010).
NO >> GO TO 3.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1926” or “C1932” detected?

C1926 >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-162, "Special Repair Requirement".

C1932 >> Replace steering angle sensor. Refer to BRC-144, "Removal and Installation".
NO >> GO TO 4.

4. INFORMATION CHECK

With CONSULT-III

Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-63, "Reference Value".

Is each data the standard value?

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

NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-162, "Special Repair Requirement".

Special Repair Requirement

INFOID:0000000006136408

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

C1930 4WAS FRONT CONTROL UNIT

DTC Logic

INFOID:0000000006045078

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
C1930	4WAS FRONT ECU	An error is detected on 4WAS front control unit side. (4WAS front control unit fail-safe mode)	4WAS front control unit fail-safe mode

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1930” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-163, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045079

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is any DTC except “C1930” detected?

YES >> Check the error system.
NO >> Perform self-diagnosis for “4WAS(FRONT)”. Refer toSTC-48, "CONSULT-III Function [4WAS(FRONT)]".

C1931 4WAS FRONT CONTROL UNIT COMMUNICATION

Description

INFOID:0000000006045080

- 4WAS front control unit and 4WAS main control unit transmit/receive information to/from each other for optimum control of the 4WAS system with the specified 4WAS system line (4WAS communication line) between 4WAS front control unit and 4WAS main control unit.
- Be careful to repair wirings because 4WAS system specified line adopts twisted-pair wires. Refer to STC-33, "Precautions for Harness Repair".

DTC Logic

INFOID:0000000006045081

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	Diagnostic item is detected when...	Possible cause
C1931	4WAS FRONT ECU COMM	4WAS communication line* data communication error is detected. (An error signal is detected from 4WAS front control unit.)	4WAS communication line*/4WAS front control unit/4WAS main control unit error

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

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “C1931” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-164, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045082

1.CHECK COMMUNICATION LINE (1)

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

ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector	Terminal	
E41	6	M143	2	Existed
	16		3	

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

2.CHECK COMMUNICATION LINE (2)

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

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E41	6	Ground	Not existed
	16		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

3.CHECK COMMUNICATION LINE (3)

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

ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal		
E41	6	16	Not existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

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

Check the ABS actuator and electric unit (control unit) connector. Refer to STC-166, "Component Inspection [ABS Actuator and Electric Unit (Control Unit)]".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-141, "Removal and Installation".

5.CHECK YAW RATE/SIDE/DECEL G SENSOR

Check the between yaw rate/side/decel G sensor connector. Refer to STC-167, "Component Inspection (Yaw Rate/Side/Decel G Sensor)".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Replace yaw rate/side G sensor. Refer to BRC-143, "Removal and Installation".

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

With CONSULT-III

1. Connect ABS actuator and electric unit (control unit) harness connector.
2. Connect yaw rate/side/decel G sensor harness connector.
3. Connect 4WAS front control unit harness connector.
4. Connect 4WAS main control unit harness connector.
5. Start the engine.
   CAUTION:
   Never drive the vehicle.
6. Perform CAN diagnosis support monitor for “4WAS(FRONT)”.
7. Check error history between 4WAS front control unit and 4WAS main control unit. Refer to STC-48, "CONSULT-III Function [4WAS(FRONT)]".

What is the indicated item?

All items are “OK”>>GO TO 7.
“TRANSMIT DIAG” is except “OK”>>GO TO 7.
“4WAS(MAIN)” is except “OK”>>GO TO 8.

7.CHECK 4WAS FRONT CONTROL UNIT CIRCUIT

1. Turn the ignition switch OFF.

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

4WAS front control unit		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
M42	14	E41	6	Existed
	25		16	

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

Is the inspection result normal?

YES >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
- Before replacing 4WAS front control unit, record the self-diagnosis results (histry). Refer to STC-167, "Special Repair Requirement".

NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

8. CHECK 4WAS MAIN CONTROL UNIT CIRCUIT

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

4WAS main control unit		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	
B54	31	E41	16	Existed
	32		6	

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

Is the inspection result normal?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-167, "Special Repair Requirement".

NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

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

INFOID:0000000006045083

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

1. Turn the ignition switch OFF.
2. Remove ABS actuator and electric unit (control unit). Refer toBRC-141, "Removal and Installation".
3. Check the resistance between ABS actuator and electric unit (control unit) connector terminals.

ABS actuator and electric unit (control unit)	Resistance (Approx.)
Terminal	
16 – 6	120 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ABS actuator and electric unit (control unit). Refer toBRC-141, "Removal and Installation".

Component Inspection (Yaw Rate/Side/Decel G Sensor)

INFOID:0000000006045084

1. CHECK YAW RATE/SIDE/DECEL G SENSOR

1. Turn the ignition switch OFF.
2. Remove yaw rate/side/decel G sensor. Refer to BRC-143, "Removal and Installation".
3. Check the resistance between yaw rate/side/decel G sensor connector terminals.

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace yaw rate/side/decel G sensor. Refer to BRC-143, "Removal and Installation".

Special Repair Requirement

INFOID:0000000006136409

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000006045086

- CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
- 4WAS front control unit and 4WAS main control unit transmit/receive information to/from each other for optimum control of the 4WAS system with the specified 4WAS system line (4WAS communication line) between 4WAS front control unit and 4WAS main control unit.
- Be careful to repair wirings because 4WAS system specified line adopts twisted-pair wires. Refer to STC-33, "Precautions for Harness Repair".

DTC Logic

INFOID:0000000006045087

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
U1000	CAN COMM	When 4WAS main control unit is not transmitting or receiving CAN communication signal for 2 seconds or more.	CAN communication error
		When 4WAS main control unit is not transmitting or receiving 4WAS communication signal for 2 seconds or more.	4WAS communication line*/4WAS main control unit/4WAS front control unit error

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

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “U1000” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-168, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045088

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

With CONSULT-III

Check the self-diagnostic result.

Is DTC “U1931” detected with “U1000”?

YES >> Refer to STC-164, "Diagnosis Procedure" (C1931), STC-168, "Diagnosis Procedure" (U1000).
NO >> Perform CAN diagnosis. Refer to LAN-25, "Trouble Diagnosis Flow Chart".

U1010 CONTROL UNIT (CAN)

Description

INFOID:0000000006045090

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

DTC Logic

INFOID:0000000006045091

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible cause
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of 4WAS main control unit.	CAN communication line/ 4WAS main control unit/ ECM/ABS actuator and electric unit (control unit) error

DTC CONFIRMATION PROCEDURE

1.RECHECK DTC

With CONSULT-III

1. Turn the ignition switch from OFF to ON.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “U1010” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-169, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006045092

1.4WAS MAIN CONTROL UNIT

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

Is the inspection result normal?

YES >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-169, "Special Repair Requirement".

NO >> Repair or replace the harnesses and connectors. Refer to STC-33, "Precautions for Harness Repair".

Special Repair Requirement

INFOID:0000000006136411

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

POWER SUPPLY AND GROUND CIRCUIT

Description

INFOID:0000000006045094

4WAS system power supply

Diagnosis Procedure (4WAS Front Control Unit)

INFOID:0000000006045095

1.CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (1)

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M41	11	Ground	Battery voltage

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M41	11	Ground	Battery voltage

Is the inspection result normal?

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

2.CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 40A fusible link (Q).
3. Check the harness for open or short between 4WAS front control unit harness connector No.11 terminal and 40A fusible link (Q).

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to PG-11, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

3.CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (3)

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M42	15	Ground	0 V

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

4WAS front control unit		—	Voltage (Approx.)
Connector	Terminal		
M42	15	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4. CHECK 4WAS FRONT CONTROL UNIT POWER SUPPLY (4)

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

4WAS front control unit		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M42	15	M1	2A	Existed

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

4WAS front control unit		—	Continuity
Connector	Terminal		
M42	15	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-84, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

5. CHECK 4WAS FRONT CONTROL UNIT GROUND

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace the harnesses and connectors.

Diagnosis Procedure (4WAS Main Control Unit)

INFOID:0000000006045096

1. CHECK 4WAS MAIN CONTROL UNIT GROUND

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

4WAS main control unit		—	Continuity
Connector	Terminal		
B54	34	Ground	Existed
	40		

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the harnesses and connectors.

2. CHECK 4WAS MAIN CONTROL UNIT POWER SUPPLY (1)

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

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

2. Turn the ignition switch ON.
CAUTION:
Never start the engine.
3. Check the voltage between 4WAS main control unit harness connector terminal and ground.

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

Is the inspection result normal?

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

3. CHECK 4WAS MAIN CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.
2. Check the 10A fuse (#46).
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between 4WAS main control unit harness connector and IPDM E/R harness connector.

4WAS main control unit		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
B54	27	E5	12	Existed

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

4WAS main control unit		—	Continuity
Connector	Terminal		
B54	27	Ground	Not existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-84, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

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

1. Remove 4WAS rear motor relay.
2. Check the continuity between 4WAS rear motor relay harness connector and ground.

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

3. Check the continuity between 4WAS main control unit harness connector and IPDM E/R harness connector.

4WAS rear motor relay		4WAS main control unit		Continuity
Connector	Terminal	Connector	Terminal	
B53	1	B54	25	Existed

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

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

1. Check 20A fusible link (#37).
2. Check the harness for open or short between 4WAS front control unit harness connector No.3 terminal and 20A fusible link (#37).

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

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

1. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
2. Check the voltage between 4WAS main control unit harness connectors and the ground.

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

3. Turn the ignition switch OFF.

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-174, "Special Repair Requirement".

7. CHECK 4WAS REAR MOTOR RELAY

Check 4WAS rear motor relay. Refer to STC-173, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 8.
NO >> Replace 4WAS rear motor relay.

8. CHECK 4WAS REAR MOTOR POWER SUPPLY

1. Connect 4WAS main control unit harness connector.
2. Install 4WAS rear motor relay.
3. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
4. Check the voltage between 4WAS main control unit harness connectors and the ground.

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

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-174, "Special Repair Requirement".

Component Inspection

INFOID:0000000006134039

1. CHECK 4WAS REAR MOTOR RELAY

1. Turn the ignition switch OFF.
2. Remove 4WAS rear motor relay connector.
3. Apply 12 V to 4WAS rear motor relay connector No. 1 terminal and No. 2 terminal.

CAUTION:
- **Never make the terminals short.**
- **Connect the fuse between the terminals when applying the voltage.**

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

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

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace 4WAS rear motor relay.

Special Repair Requirement

INFOID:0000000006136420

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

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

POWER STEERING SOLENOID VALVE

Diagnosis Procedure

INFOID:0000000006045098

1.CHECK POWER STEERING SOLENOID VALVE SIGNAL

With CONSULT-III

1. Start the engine.
2. Check “POWER STR SOL” item on “DATA MONITOR” of 4WAS main control unit.

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

Without CONSULT-III

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

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

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-176, "Special Repair Requirement".

2.CHECK POWER STEERING SOLENOID VALVE CIRCUIT

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

4WAS main control unit		Power steering solenoid valve		Continuity
Connector	Terminal	Connector	Terminal	
B54	36	F55	1	Existed

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

Power steering solenoid valve		—	Continuity
Connector	Terminal		
F55	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the harnesses and connectors.

3.CHECK POWER STEERING SOLENOID VALVE

Check the resistance between power steering solenoid valve connector terminals. Refer to STC-176, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair gear-sub assembly. Refer to ST-46, "2WD : Disassembly and Assembly".

Component Inspection

INFOID:0000000006045099

1. CHECK POWER STEERING SOLENOID VALVE

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

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

2. Check for click sound (power steering solenoid valve activation sound) when applying approximately 12 V between the power steering solenoid valve connector terminals.
   CAUTION:
   - **Never make the terminals short.**
   - **Assign the positive terminal to No. 1 terminal, and the negative terminal to No. 2 terminal. Connect the fuse between the terminals when applying the voltage.**

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair gear-sub assembly. Refer to ST-46, "2WD : Disassembly and Assembly".

Special Repair Requirement

INFOID:0000000006137501

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

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

4WAS WARNING LAMP

Diagnosis Procedure

INFOID:0000000006045100

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

With CONSULT-III

Perform the self-diagnosis for “METER/M&A”.

Is any error system detected?

YES >> Check the error system. Refer to MWI-43, "DTC Index".
NO >> GO TO 2.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is DTC “U1000” or “U1010” detected?

YES >> Check the error system. Refer to STC-168, "Diagnosis Procedure" (U1000), STC-169, "Diagnosis Procedure" (U1010).
NO >> GO TO 3.

3. CHECK 4WAS WARNING LAMP SIGNAL

With CONSULT-III

1. Turn the ignition switch ON.
   CAUTION:
   Never start the engine.
2. Check “WARNING LAMP” item on DATA MONITOR for “4WAS(MAIN)/RAS/HICAS”.

Does the item on “DATA MONITOR” indicate “On”?

YES >> GO TO 4.
NO >> Replace 4WAS main control unit. Refer to STC-185, "Removal and Installation".
- Before replacing 4WAS main control unit, record the self-diagnos results(history). Refer to STC-177, "Special Repair Requirement".

4. CHECK COMBINATION METER

With CONSULT-III

Perform the trouble diagnosis of the combination meter. Refer to MWI-70, "COMBINATION METER : Diagnosis Procedure".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the combination meter. Refer to MWI-90, "Removal and Installation".

Special Repair Requirement

INFOID:0000000006137502

Before replacing 4WAS main control unit, record the self-diagnosis results (history).

CAUTION:

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

SYMPTOM DIAGNOSIS

4WAS WARNING LAMP DOES NOT TURN ON

Description

INFOID:0000000006045102

4WAS warning lamp does not turn ON when turning ignition switch ON from OFF.

Diagnosis Procedure

INFOID:0000000006045103

1.CHECK 4WAS SYSTEM POWER SUPPLY AND GROUND CIRCUIT

Perform the trouble diagnosis of the power supply and ground circuit. Refer to STC-170, "Diagnosis Procedure (4WAS Front Control Unit)" and STC-171, "Diagnosis Procedure (4WAS Main Control Unit)".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the specific malfunctioning part.

2.CHECK 4WAS WARNING LAMP

Perform the trouble diagnosis of 4WAS warning lamp. Refer to STC-177, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
NO >> Repair or replace the specific malfunctioning part.

4WAS WARNING LAMP DOES NOT TURN OFF

Description

INFOID:0000000006045104

4WAS system stops (error) when turning 4WAS warning lamp ON.

Diagnosis Procedure

INFOID:0000000006045105

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is any DTC detected other than “C1930” or “C1931”?

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

2. PERFORM TROUBLE DIAGNOSIS (4WAS MAIN CONTROL UNIT)

With CONSULT-III

1. Check the error system detected from the self-diagnosis.
2. Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS” again after the inspection.

Is any error system detected?

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

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

With CONSULT-III

Perform self-diagnosis for “4WAS(FRONT)”.

Is any error system detected?

YES >> Check the error system.
NO >> GO TO 4.

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

With CONSULT-III

Perform self-diagnosis for “4WAS(MAIN)/RAS/HICAS”.

Is any error system detected?

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

STEERING WHEEL MISS ALIGNMENT

Description

INFOID:0000000006045106

- The steering wheel position (center) is in the wrong position at driving.
- 4WAS system stops temporarily.

NOTE:

- The steering wheel position (center) is in the wrong position under the following condition. (4WAS system is in the protection mode. This is normal status.)
  - When steering frequently
  - When driving on a rough road
  - When the assist of power steering is not sufficient
  - When the battery voltage is weak
  - When driving under the status that there is a difference in the steering wheel

Diagnosis Procedure

INFOID:0000000006045107

1.CHECK SYMPTOM

Never drive the vehicle in the straight-ahead position after driving for a period of time.

Does the steering wheel position (center) misalign?

YES >> INSPECTION END (Entered in 4WAS system protection function mode in past. 4WAS system is normal at present.)
NO >> GO TO 2.

2.4WAS FRONT ACTUATOR INITIALIZATION

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Steer 90° leftward slowly. Steer 90° rightward and return the steering wheel to the straight-ahead position. Repeat the above 10 times.
3. Stop the vehicle in the straight-ahead position after driving for a period of time.

Does the steering wheel position (center) misalign?

YES >> INSPECTION END (Entered in 4WAS system protection function mode in past. 4WAS system is normal at present.)
NO >> GO TO 3.

3.4WAS SYSTEM CONDITION

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Check “EX OPERAT” item on “DATA MONITOR” for “4WAS(FRONT)”.

Does the item on “DATA MONITOR” indicate “On”?

YES >> GO TO 7.
NO >> GO TO 4.

4.CHECK STEERING SYSTEM

Check the steering system. Refer to ST-31, "Inspection" and ST-15, "Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace the specific malfunctioning part.

5.CHECK WHEEL ALIGNMENT

Check the wheel alignment. Refer to FSU-8, "Inspection" (front side), RSU-6, "Inspection" (rear side).

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace the specific malfunctioning part.

6.PERFORM 4WAS FRONT ACTUATOR ADJUSTMENT

1. Perform 4WAS front actuator adjustment. Refer to STC-88, "Work Procedure (Pattern 3)".
2. Stop the vehicle in the straight-ahead position after driving for a period of time.

Does the steering wheel position (center) misalign?

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

7.CHECK 4WAS SYSTEM IGNITION POWER SUPPLY

Perform the trouble diagnosis of the ignition power supply. Refer to STC-103, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace the specific malfunctioning part.

8.CHECK 4WAS SYSTEM 4WAS FRONT MOTOR POWER SUPPLY

Perform the trouble diagnosis of 4WAS front motor power supply. Refer to STC-105, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair or replace the specific malfunctioning part.

9.CHECK 4WAS SYSTEM HISTORY

With CONSULT-III

1. Turn the ignition switch OFF.
   CAUTION:
   Wait 30 minutes or more after turning the ignition switch OFF.
2. Start the engine.
   CAUTION:
   Never drive the vehicle.
3. Check “EX OPERAT” on 4WAS front control unit “DATA MONITOR”.

Is the value of DATA MONITOR “On”?

YES >> Replace 4WAS front control unit. Refer to STC-184, "Removal and Installation".
NO >> INSPECTION END

STEERING SYSTEM VIBRATION AND NOISE

Description

INFOID:0000000006045108

Vibration or noise occurs in the steering wheel while driving the vehicle.

NOTE:

Vibration or noise occurs in the steering wheel in the following conditions. (4WAS system is not malfunction.)

- 4WAS system starts and ends (when the engine speed is ON⇔OFF).
- System protection mode
  - When steering frequently
  - When driving on a rough road
  - When the assist of power steering is not sufficient
  - When the battery voltage is weak

Diagnosis Procedure

INFOID:0000000006045109

1.CHECK 4WAS SYSTEM

With CONSULT-III

1. Start the engine.
   CAUTION:
   Never drive the vehicle.
2. Check “OVRLD JDG FLG”, “ACT PRTCT FLG”, “ECU PRTCT FLG”,“LOW VOLT FLG”, “HIGH VOLT FLG”, “EX OPERAT” items on “DATA MONITOR” for 4WAS(FRONT).

Does all items on “DATA MONITOR” indicate “Off”?

YES >> INSPECTION END (Vibration and sound occurs in 4WAS system protection function mode. This is normal.)

NO >> GO TO 2.

2.STOP 4WAS FRONT ACTUATOR CONTROL

1. Turn the ignition switch OFF.
2. Disconnect 4WAS front actuator harness connector.
   CAUTION:
   Disconnect 4WAS front actuator harness connector 10 minutes after turning the ignition switch OFF.
3. Drive the vehicle for a period of time. Check the symptom.
   CAUTION:
   Erase the self-diagnosis memory after the inspection is completed to detect 4WAS front control unit DTC “C1661”. [Erase the self diagnosis memory of 4WAS main control unit, ABS actuator and electric unit (control unit) and ADAS control unit simultaneously.]

Does symptom not occur?

YES >> Replace 4WAS front actuator. Refer to ST-41, "WITH 4WAS : Removal and Installation".

NO >> Perform the steering system. Refer to ST-31, "Inspection" and ST-15, "Inspection".

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

Description

INFOID:0000000006045110

- The steering force does not change smoothly according to the vehicle speed.
- The steering force is heavy when steering.
- The steering force is light when driving at high speed.

Diagnosis Procedure

INFOID:0000000006045111

1. CHECK 4WAS SYSTEM VEHICLE SPEED SIGNAL

Perform the trouble diagnosis of the vehicle speed signal. Refer to STC-151, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the specific malfunctioning part.

2. CHECK STEERING SYSTEM

Check the steering system. Refer to ST-31, "Inspection" and ST-15, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the specific malfunctioning part.

3. CHECK 4WAS SYSTEM POWER STEERING SOLENOID VALVE

Perform the trouble diagnosis of the power steering solenoid valve. Refer to STC-175, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Check that there is no malfunction in each harness connector pin terminal or disconnection.
NO >> Repair or replace the specific malfunctioning part.

REMOVAL AND INSTALLATION

4WAS FRONT CONTROL UNIT

Removal and Installation

INFOID:0000000006045112

REMOVAL

CAUTION:

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

1. Turn the ignition switch OFF.
2. Remove the glove box. Refer to IP-13, "Removal and Installation".
3. Remove the instrument lower panel RH. Refer to IP-13, "Removal and Installation".
4. Disconnect 4WAS front control unit connectors.
   CAUTION:
   Disconnect 4WAS front control unit connectors 10 minutes after turning the ignition switch OFF.
5. Remove the bolts of 4WAS front control unit.
6. Remove the 4WAS front control unit.

INSTALLATION

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

- Perform 4WAS front actuator adjustment after replacing 4WAS front control unit. Refer to STC-88, "Work Procedure (Pattern 3)".

4WAS MAIN CONTROL UNIT

Removal and Installation

INFOID:0000000006045113

REMOVAL

CAUTION:

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

1. Turn the ignition switch OFF.
2. Remove the trunk side finisher (LH). Refer to INT-54, "TRUNK SIDE FINISHER : Removal and Installation".
3. Disconnect 4WAS main control unit connectors, 4WAS rear motor relay connector and noise suppressor connectors.
4. Remove the 4WAS main control unit bolts.
5. Remove the 4WAS main control unit.

INSTALLATION

Install in the reverse order of removal.

4WAS FRONT ACTUATOR ASSEMBLY

Removal and Installation

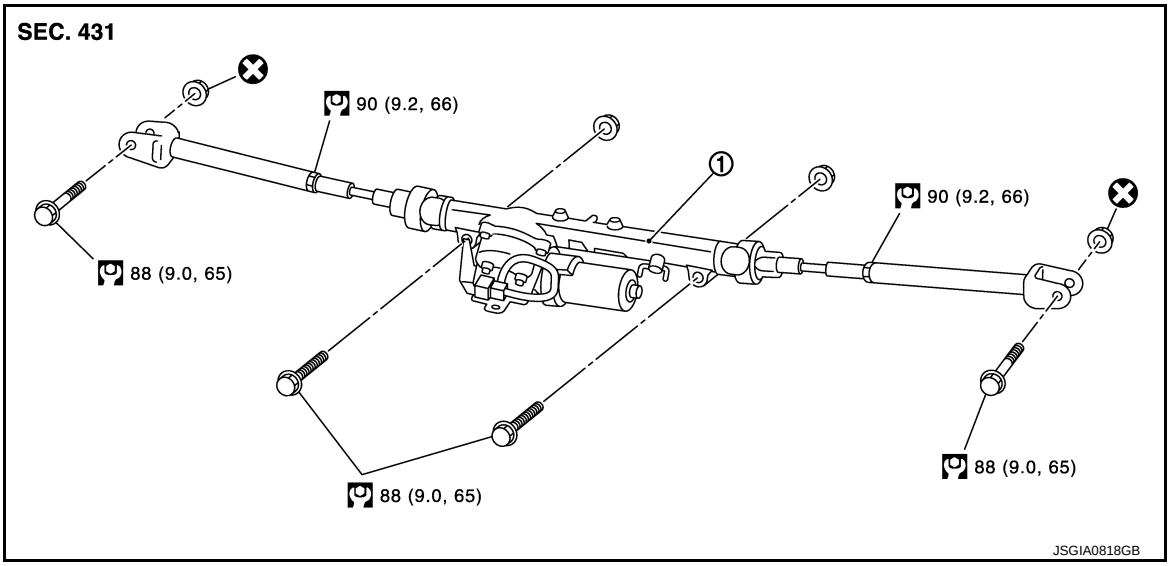
INFOID:0000000006045114

- For removal and installation, refer to ST-41, "WITH 4WAS : Removal and Installation".
- Perform 4WAS front actuator adjustment after replacing 4WAS front actuator. Refer to STC-87, "Work Procedure (Pattern 2)".

4WAS REAR ACTUATOR ASSEMBLY

Exploded View

INFOID:0000000006045115



1. 4WAS rear actuator assembly

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000006045116

REMOVAL

1. Remove fixing bolts and nuts of 4WAS rear actuator from lower link. Refer to RSU-17, "Removal and Installation".
2. Disconnect harness connector from 4WAS rear actuator and rear suspension member.
3. Remove fixing bolts and nuts of 4WAS rear actuator, and then remove 4WAS rear actuator from rear suspension member.

INSTALLATION

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

- When installing 4WAS rear actuator to rear suspension member, check the mounting surfaces of 4WAS rear actuator and rear suspension member for oil, dirt, sand, or other foreign materials.
- Check rear wheel alignment. Refer to RSU-6, "Inspection".