SECTION STC
STEERING CONTROL SYSTEM

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000005235332

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-12, "Inspection".
2. Check the drive belt tension. Refer to EM-15, "Checking" (VQ35HR), EM-163, "Checking" (VK50VE).
3. Check the power steering gear for damages, cracks and fluid leakage. Refer to ST-34, "Inspection".
4. Check the relief oil pressure. Refer to ST-40, "VQ35HR : Inspection" (VQ35HR), ST-46, "VK50VE : Inspection" (VK50VE).

>> GO TO 3.

3.DIAGNOSIS CHART BY SYMPTOM

Perform the diagnosis by symptom. Refer to STC-25, "Diagnosis Procedure".

>> GO TO 4.

4.FINAL CHECK

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

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

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

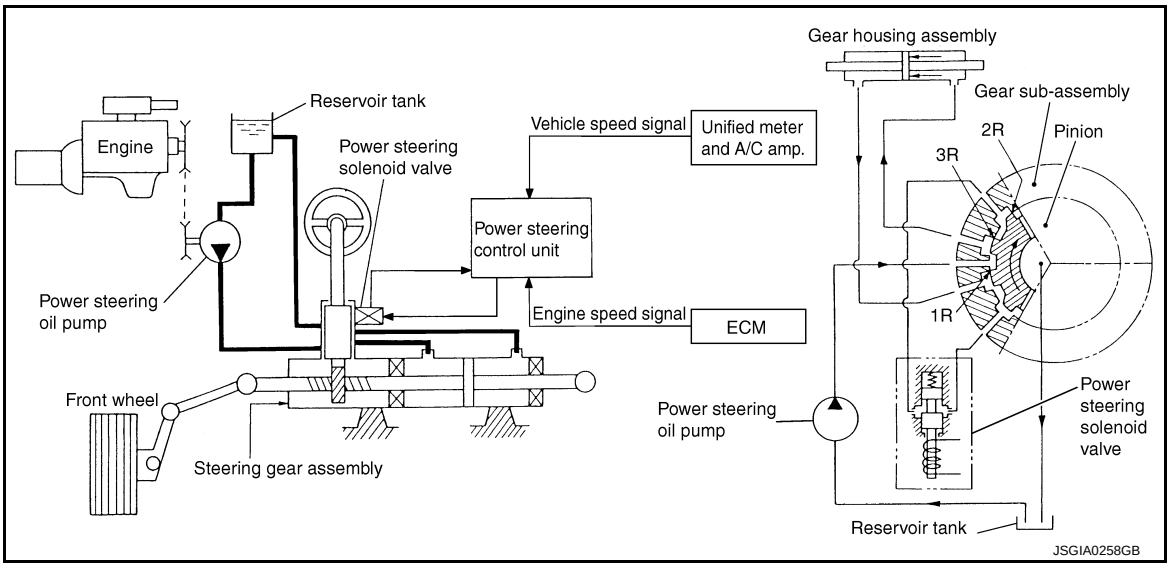
SYSTEM DESCRIPTION

EPS SYSTEM

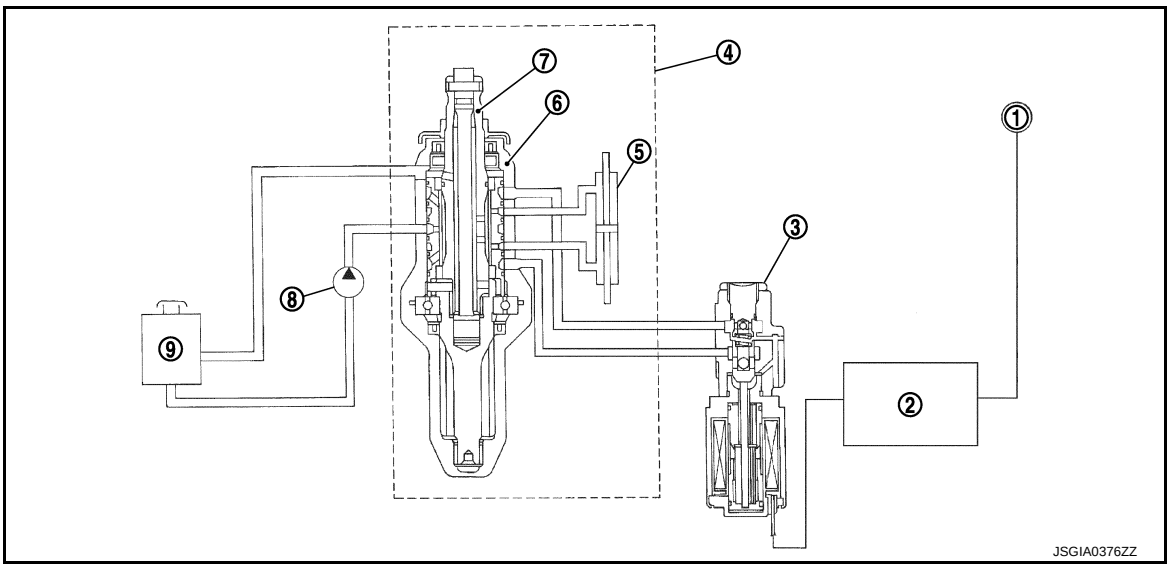
System Diagram

INFOID:0000000005235333

CONTROL DIAGRAM



CROSS-SECTIONAL VIEW



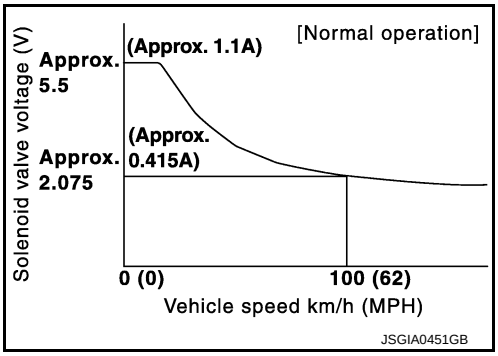
1. Unified meter and A/C amp.
2. Power steering control unit
3. Power steering solenoid valve
4. Steering gear assembly
5. Gear housing assembly
6. Gear sub-assembly
7. Pinion
8. Power steering oil pump
9. Reservoir tank

System Description

INFOID:0000000005235334

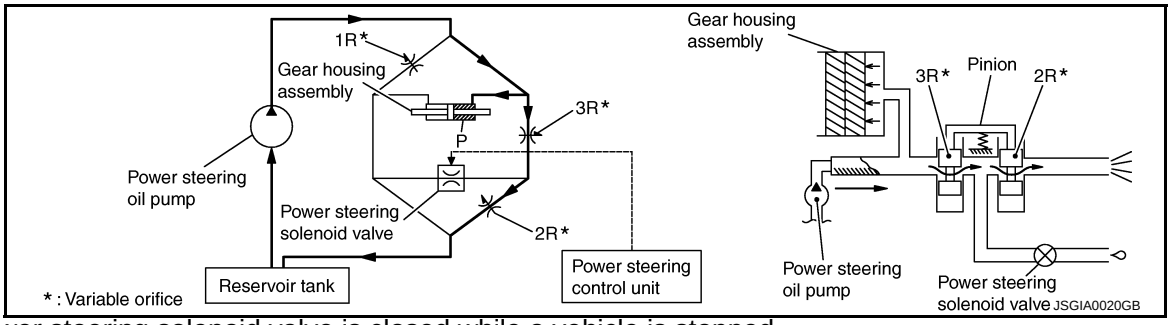
- The EPS system controls the power steering solenoid valve through the power steering control unit.

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



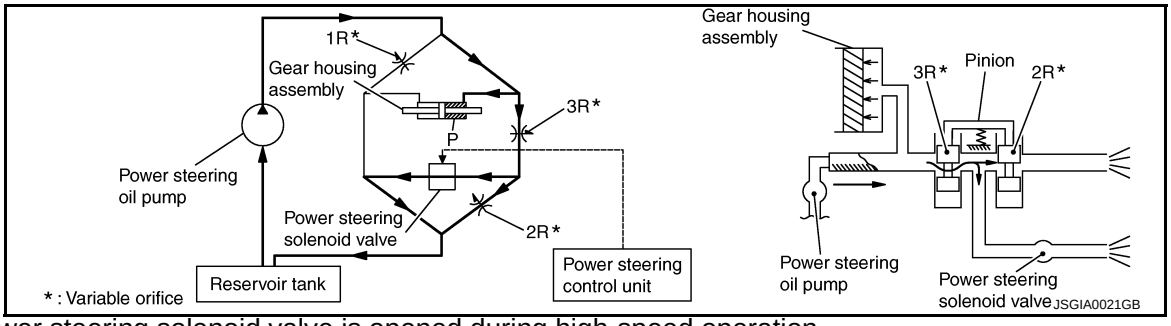
OPERATION PRINCIPLE

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.

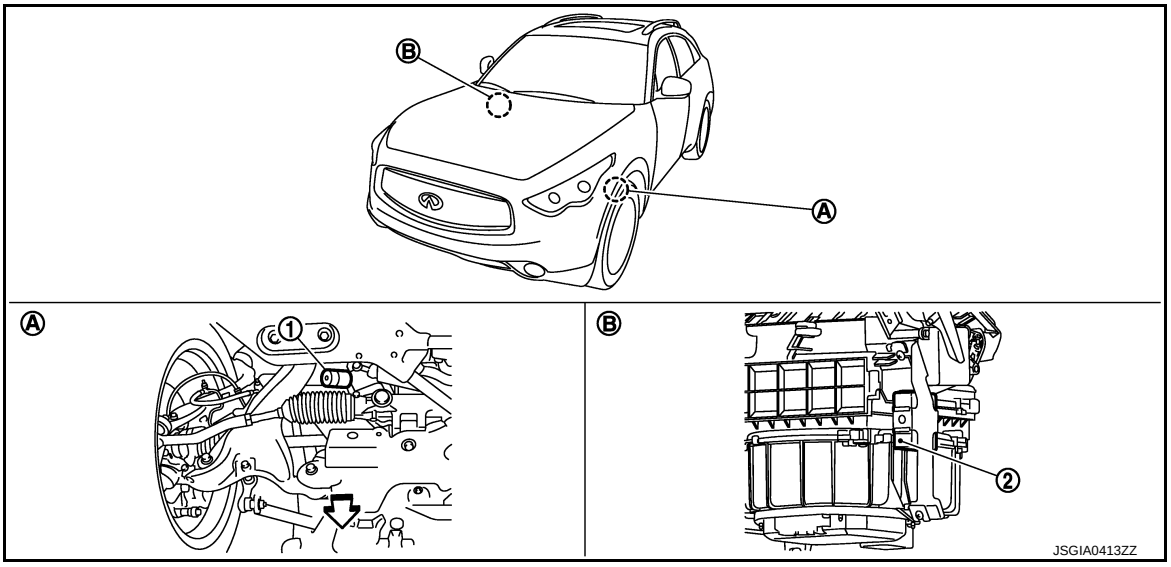
During High-speed Operation



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.

Component Parts Location

INFOID:0000000005235335



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

⇦: Vehicle front

Component Description

INFOID:0000000005235336

Component parts	Reference/Function
Power steering control unit	• Signals from various sensors control the driving voltage to the power steering solenoid valve. • The power steering control unit controls the driving voltage to the power steering solenoid valve for maintaining the power steering assist force when the fail-safe function is activated. (The engine speed signals control EPS system if any vehicle speed signal error is detected.)
Unified meter and A/C amp.	STC-14, "Description"
ECM	STC-11, "Description"
Power steering solenoid valve	STC-9, "Description"

DTC/CIRCUIT DIAGNOSIS

POWER SUPPLY AND GROUND CIRCUIT

Description

INFOID:0000000005235337

Power supply to EPS system

Diagnosis Procedure

INFOID:0000000005235338

1.CHECK POWER SUPPLY

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

Power steering control unit		—	Voltage
Connector	Terminal		
M108	3	Ground	0 V

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

Power steering control unit		—	Voltage
Connector	Terminal		
M108	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check the following. If any items are damaged, repair or replace damaged parts.
- 10A fuses (#45) open
- Harness for short or open between ignition switch and power steering control unit harness connector No. 3 terminal.
- Ignition switch.

2.CHECK GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check 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 3.
NO >> Repair open circuit or short to power in harness or connectors.

3.CHECK TERMINALS AND HARNESS CONNECTORS

Check 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

Description

INFOID:0000000005235339

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

Diagnosis Procedure

INFOID:0000000005235340

1.CHECK POWER STEERING SOLENOID VALVE SIGNAL

1. Turn the ignition switch OFF.
2. Check 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 2.
NO >> GO TO 4.

2.CHECK HARNESS BETWEEN POWER STEERING SOLENOID VALVE AND POWER STEERING CONTROL UNIT

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	
F45	1	M108	1	Existed
	2		5	Existed

5. Check 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 damaged parts.

3.CHECK POWER STEERING SOLENOID VALVE

Check power steering solenoid valve. Refer to STC-10, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace gear-sub assembly. Refer to ST-26, "Exploded View".

4.CHECK TERMINALS AND HARNESS CONNECTORS

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

Component Inspection

INFOID:0000000005235341

1. CHECK POWER STEERING SOLENOID VALVE

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

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

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace gear-sub assembly. Refer to ST-26, "Exploded View".

ENGINE SPEED SIGNAL CIRCUIT

Description

INFOID:0000000005235342

ECM sends engine speed signal to power steering control unit.

Diagnosis Procedure

INFOID:0000000005235343

1.PERFORM ECM SELF-DIAGNOSIS

With CONSULT-III

1. Turn the ignition switch ON.
2. Perform “ENGINE” self-diagnosis. Refer to EC-124, "CONSULT-III Function" (VQ35HR), EC-718, "CONSULT-III Function" (VK50VE).

Is any DTC detected?

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

2.CHECK HARNESS BETWEEN ECM AND POWER STEERING CONTROL UNIT

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

ECM		Power steering control unit		Continuity
Connector	Terminal	Connector	Terminal	
M107 (VQ35HR)	110	M108	10	Existed
M160 (VK50VE)	97			

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

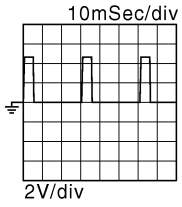
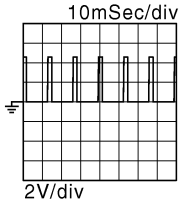
Power steering control unit		—	Continuity
Connector	Terminal		
M108	10	Ground	Not existed

Is the inspection result normal?

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

3.CHECK ENGINE SPEED SIGNAL (1)

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

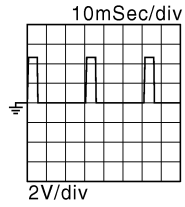
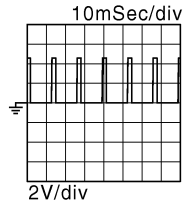
ECM		—	Condition	Voltage (Approx.)
Connector	Terminal			
M107 (VQ35HR) M160 (VK50VE)	110 (VQ35HR) 97 (VK50VE)	Ground	Engine is running • Warm-up condition • Idle speed	
			Engine is running • Warm-up condition • Engine speed: Approx. 2,000 rpm	

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace ECM. Refer to EC-23, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description" (VQ35HR), EC-579, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT (ECM) : Description" (VK50VE).

4. CHECK ENGINE SPEED SIGNAL (2)

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

Power steering control unit		—	Condition	Voltage (Approx.)
Connector	Terminal			
M108	10	Ground	Engine is running • Warm-up condition • Idle speed	
			Engine is running • Warm-up condition • Engine speed: Approx. 2,000 rpm	

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace power steering control unit. Refer to STC-27, "Removal and Installation".

5. CHECK TERMINALS AND HARNESS CONNECTORS

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace damaged parts.

VEHICLE SPEED SIGNAL CIRCUIT

Description

INFOID:0000000005235344

Unified meter and A/C amp. sends vehicle speed signal to power steering control unit.

Diagnosis Procedure

INFOID:0000000005235345

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

With CONSULT-III

1. Turn the ignition switch ON.
2. Perform “METER/M&A” self-diagnosis. Refer to MWI-45, "CONSULT-III Function (METER/M&A)".

Is any DTC detected?

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

2.CHECK HARNESS BETWEEN UNIFIED METER AND A/C AMP. AND POWER STEERING CONTROL UNIT

1. Turn the ignition switch OFF.
2. Disconnect unified meter and A/C amp. harness connector.
3. Disconnect power steering control unit harness connector.
4. Check continuity between unified meter and A/C amp. harness connector and power steering control unit harness connector.

Unified meter and A/C amp.		Power steering control unit		Continuity
Connector	Terminal	Connector	Terminal	
M66	8	M108	8	Existed

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

Power steering control unit		—	Continuity
Connector	Terminal		
M108	8	Ground	Not existed

Is the inspection result normal?

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

3.CHECK VEHICLE SPEED SIGNAL (1)

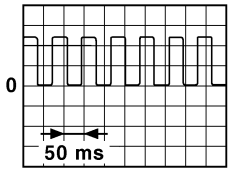
1. Connect unified meter and A/C amp. harness connector.
2. Check unified meter and A/C amp. input/output standard values. Refer to MWI-96, "Reference Value".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace unified meter and A/C amp. Refer to MWI-147, "Exploded View".

4.CHECK VEHICLE SPEED SIGNAL (2)

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

Power steering control unit		—	Condition	Voltage (Approx.)
Connector	Terminal			
M108	8	Ground	Vehicle speed: 40 km/h (25 MPH) **CAUTION:** **Check air pressure of tire under standard condition.**	**NOTE:** The maximum voltage varies depending on the specification (destination unit).  JSNIA0015GB

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace power steering control unit. Refer to STC-27, "Removal and Installation".

5. CHECK TERMINALS AND HARNESS CONNECTORS

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

Is the inspection result normal?

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

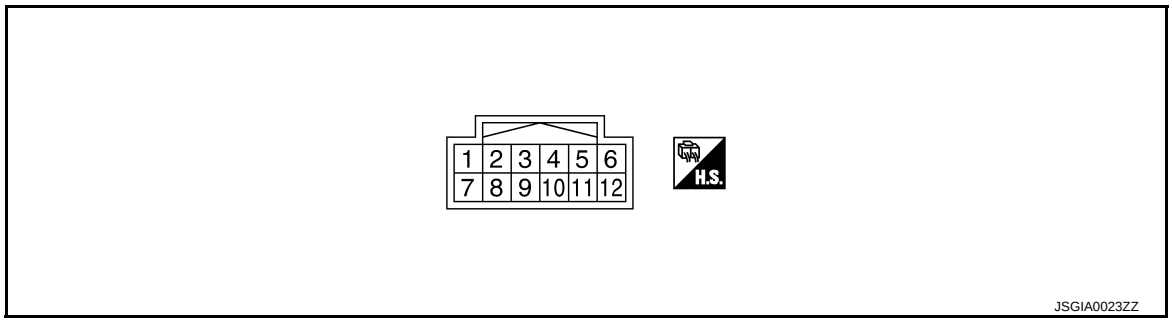
ECU DIAGNOSIS INFORMATION

POWER STEERING CONTROL UNIT

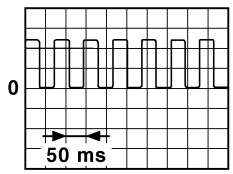
Reference Value

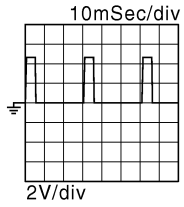
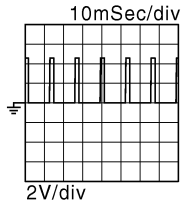
INFOID:0000000005235346

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		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)	2.4 – 3.6 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 (L)	Ground	Vehicle speed signal	Input	Vehicle speed: 40 km/h (25 MPH) **CAUTION:** **Check air pressure of tire under standard condition.**	**NOTE:** The maximum voltage varies depending on the specification (destination unit).  JSNIA0015GB

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
10 (R)	Ground	Engine speed signal	Input	Engine is running • Warm-up condition • Idle speed	 JMBIA0076GB
				Engine is running • Warm-up condition • Engine speed: Approx. 2,000 rpm	 JMBIA0077GB

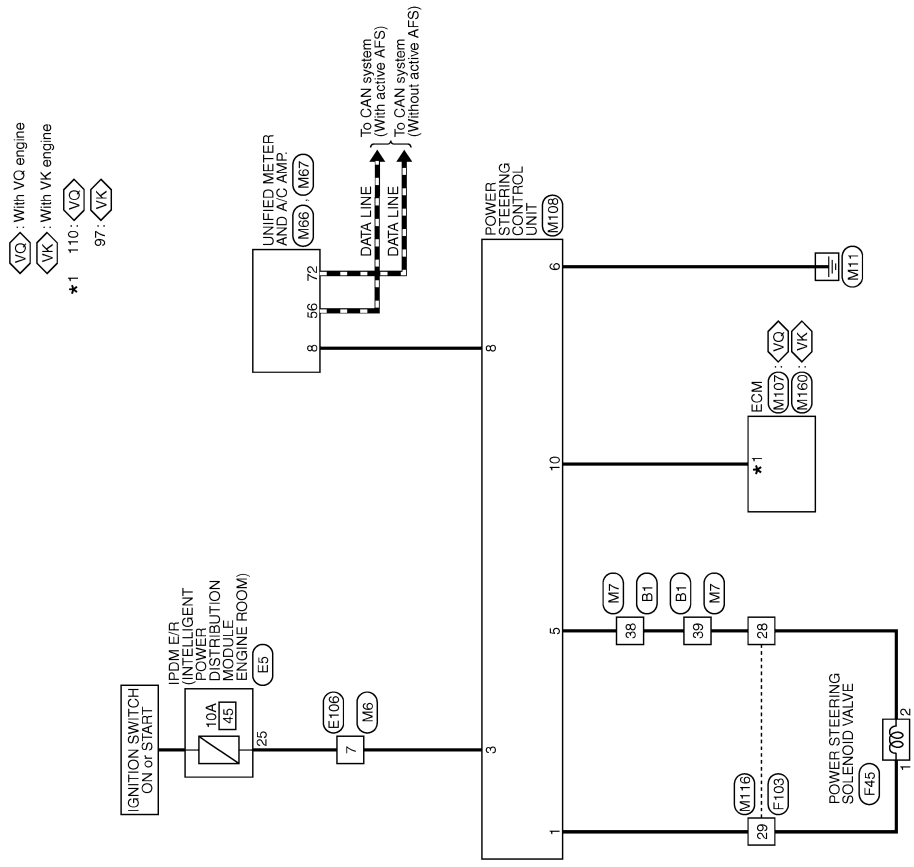
CAUTION:

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

Wiring Diagram - ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM -

INFOID:0000000005612685

ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM



2009/07/29

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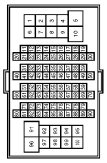
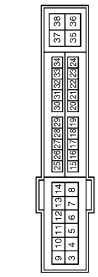
ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

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



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	L	–
3	W	–
5	G	–
6	G	–
7	P	–
8	O	–
9	W	–
10	SB	–
11	SB	–
12	B	–
13	G	–
14	R	–
15	W	–
16	SHIELD	–
17	L	–
18	P	–
19	G	–
20	Y	–
21	W	–
23	V	–
24	P	–
25	BR	–
26	GR	–
27	O	–
28	W	–
29	SHIELD	–
38	B	–
39	B	–
40	LG	–
41	G	–
42	GR	–
43	SB	–
44	V	–
45	GR	–
50	B	–
51	V	–
52	SB	–
53	SHIELD	–
54	BR	–
55	Y	–
56	SHIELD	–
57	P	–
58	L	–
59	SHIELD	–
60	L	–
61	P	–
62	GR	–
63	G	–
64	O	–
65	W	–
66	V	–
67	LG	–
68	Y	–
69	G	–
70	GR	–
71	G	–
72	B	–
73	W	–
74	V	–
75	O	–
76	LG	–
77	L	–
78	GR	–
79	W	–
80	L	–
81	P	–
82	L	–
83	P	–
84	SB	–
85	R	–
86	Y	–
87	B	–
88	G	–
89	BR	–
90	W	–
91	R	–
92	O	–
93	BR	–
94	V	–
95	Y	–
96	O	–
97	W	–
98	GR	–
99	W	–

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



Terminal No.	Color of Wire	Signal Name [Specification]
4	V	–
5	L	–
7	R	–
10	SB	–
11	BR	–
12	B	–
13	Y	–
16	LG	–
19	W	–
25	G	–
26	R	–
27	Y	–
28	O	–
30	GR	–
32	SB	–
33	P	–
36	G	–

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ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	O	–
3	SB	–
4	LG	–
5	Y	–
6	W	–
7	G	–
8	V	–
9	R	–
10	BR	–
11	B	–
12	G	–
13	R	–
14	W	–
15	SHIELD	–
16	SB	–
17	L	–
18	P	–
19	G	–
20	W	– [With ICC]
20	Y	– [Without ICC]
21	BR	–
22	R	– [With ICC]
22	V	– [Without ICC]
23	G	–
24	L	– [With ICC]
24	P	– [Without ICC]
25	Y	– [With ICC]
25	L	– [Without ICC]
26	SHIELD	–
28	G	–
29	LG	–
30	O	–
31	BR	–
32	W	–
33	Y	–
34	O	–
35	SB	–
36	P	–
37	Y	–
38	GR	–
39	LG	–
41	LG	–
42	V	–
43	R	–
44	G	–
45	GR	–
46	W	–
47	L	–
48	P	–
49	SB	–
50	BR	–
51	B	–
52	Y	–
53	O	–
54	R	–
55	SB	–
56	P	–
59	P	–
60	SB	–
61	V	–
62	P	–
63	LG	–
64	L	–
65	O	–
66	L	–
69	L	–
70	SHIELD	–
71	G	–
72	G	–
73	R	–
74	BR	–
76	L	–
77	W	–
78	Y	–
80	SB	–
81	L	–
82	W	–
83	LG	–
84	GR	–
85	G	–
86	P	–
87	W	–
88	O	–
89	LG	–
90	BR	–
91	GR	–
92	BR	–
93	SB	–
94	W	–
95	Y	–
96	W	–
100	Y	–

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.	F103
Connector Name	WIRE TO WIRE
Connector Type	TK36FW-NS10

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	SHIELD	–
2	G	–
3	W	–
4	GR	– [With VK engine]
4	R	– [With VQ engine]
5	R	– [With VK engine]
5	B	– [With VQ engine]
6	SHIELD	–
7	B	–
9	W	– [With VK engine]
9	Y	– [With VQ engine]
10	L	– [With VK engine]
10	GR	– [With VQ engine]
17	GR	–
18	R	–
19	O	–
20	Y	–
26	BR	–
27	L	–
28	B	–
29	LG	–
31	R	–
34	LG	–
35	BR	–
36	W	–
37	Y	–
38	P	–
44	L	–
45	Y	–
46	V	–

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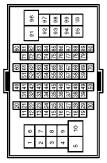
ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

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



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	O	–
3	SB	–
4	LG	–
5	GR	–
6	W	–
7	G	–
8	W	–
9	P	–
10	BR	–
11	B	–
12	G	–
13	R	–
14	W	–
15	SHIELD	–
16	BR	–
17	L	–
18	P	–
19	G	–
20	W	– [With ICC]
20	GR	– [Without ICC]
21	BR	– [With ICC]
21	R	– [Without ICC]
22	R	– [With ICC]
22	L	– [Without ICC]
23	G	–
24	L	– [With ICC]
24	P	– [Without ICC]
25	Y	– [With ICC]
25	W	– [Without ICC]
26	SHIELD	–
28	GR	–
29	V	–
30	O	–
31	BR	–
32	W	–
33	Y	–
34	L	–
35	L	–
36	P	–
37	G	–
38	R	–
39	G	–
41	L	–
42	W	–
43	R	–
44	LG	–
45	GR	–
46	W	–
47	L	–
48	P	–
49	O	–
50	LG	–
51	SB	–
52	Y	–
53	O	–
54	BR	–
55	SB	–
56	P	–
59	SB	–
60	SB	–
61	V	–
62	P	–
63	R	–
64	L	–
65	O	–
66	L	–
69	V	–
70	SHIELD	–
71	O	–
72	GR	–
73	W	–
74	SB	–
76	V	–
77	V	–
78	Y	–
80	O	–
81	L	–
82	W	–
83	Y	–
84	L	–
85	P	–
86	BR	–
87	P	–
88	V	–
89	G	–
90	P	–
91	R	–
92	R	–
93	GR	–
94	L	–
95	G	–
96	W	–
100	Y	–

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ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	B	–
3	W	–
5	G	–
6	P	–
7	V	–
8	O	–
9	W	–
10	W	–
11	O	–
12	B	–
13	G	–
14	R	–
15	W	–
16	SHIELD	–
17	L	–
18	P	–
19	G	–
20	R	–
21	LG	–
23	V	–
24	P	–
25	BR	–
26	GR	–
27	O	–
28	W	–
29	SHIELD	–
38	B	–
39	B	–
40	LG	–
41	G	–
42	Y	–
43	SB	–
44	W	–
45	B	–
50	B	–
51	V	–
52	LG	–
53	SHIELD	–
54	BR	–
55	Y	–
56	SHIELD	–
57	P	–
58	L	–
59	SHIELD	–
60	L	–
61	BR	–
62	R	–
63	Y	–
64	L	–
65	W	–
66	V	–
67	LG	–
68	Y	–
69	G	–
70	V	–
71	W	–
72	B	–
73	W	–
74	LG	–
75	P	–
76	LG	–
77	SB	–
78	GR	–
79	R	–
80	L	–
81	P	–
82	L	–
83	P	–
84	SB	–
85	W	–
86	Y	–
87	B	–
88	G	–
89	O	–
90	W	–
91	R	–
92	O	–
93	BR	–
94	V	–
95	Y	–
96	O	–
97	W	–
98	R	–
99	G	– [With VK engine] – [With VQ engine]
99	O	

Connector No.	M66
Connector Name	UNIFIED METER AND A/C AMP.
Connector Type	TH40FW-NH

H.S.

1	2	3	4	5	6	7	8	9	10	11		14	15	16		20
21	22	23		25	26	27	28	29				34		36		40

Terminal No.	Color of Wire	Signal Name [Specification]
4	P	STOP LAMP SWITCH SIGNAL
5	L	MANUAL MODE SHIFT UP SIGNAL
6	O	PADDLE SHIFTER UP SIGNAL
7	GR	COMMUNICATION SIGNAL (AMP.->METER)
8	L	VEHICLE SPEED SIGNAL (2-PULSE)
9	SB	FRONT SEAT BELT BUCKLE SWITCH SIGNAL [DRIVER SIDE]
10	W	MANUAL MODE SIGNAL
11	G	NON-MANUAL MODE SIGNAL
14	BR	COMMUNICATION SIGNAL (LCD->AMP.)
20	L	ION SENSOR SIGNAL
23	Y	AT SNOW SWITCH SIGNAL
25	V	MANUAL MODE SHIFT DOWN SIGNAL
26	G	PADDLE SHIFTER DOWN SIGNAL
27	LG	COMMUNICATION SIGNAL (METER->AMP.)
28	R	VEHICLE SPEED SIGNAL (8-PULSE)
30	V	PARKING BRAKE SWITCH SIGNAL
34	Y	COMMUNICATION SIGNAL (AMP.->LCD)
38	L	BLOWER MOTOR CONTROL SIGNAL

Connector No.	M67
Connector Name	UNIFIED METER AND A/C AMP.
Connector Type	TH32FW-NH

H.S.

41	42	43	44	45	46	47				53	54	55	56
57	58	59	60	61	62	63		65			69	70	71	72

Terminal No.	Color of Wire	Signal Name [Specification]
41	V	ACC POWER SUPPLY
42	Y	FUEL LEVEL SENSOR SIGNAL
43	R	INTAKE SENSOR SIGNAL
44	LG	IN-VEHICLE SENSOR SIGNAL
45	P	AMBIENT SENSOR SIGNAL
46	O	SUNLOAD SENSOR SIGNAL
47	V	GAS SENSOR SIGNAL
53	G	IGNITION POWER SUPPLY
54	O	BATTERY POWER SUPPLY
55	B	GROUND
56	L	CAN-H
57	W	BRAKE FLUID LEVEL SWITCH SIGNAL
58	B	FUEL LEVEL SENSOR GROUND
59	GR	INTAKE SENSOR GROUND
60	L	IN-VEHICLE SENSOR GROUND
61	BR	AMBIENT SENSOR GROUND
62	SB	SUNLOAD SENSOR GROUND
63	R	ION MODE SIGNAL
65	O	ECV SIGNAL
69	L	A/C LAN SIGNAL
70	R	EACH DOOR MOTOR POWER SUPPLY
71	B	GROUND
72	P	CAN-L

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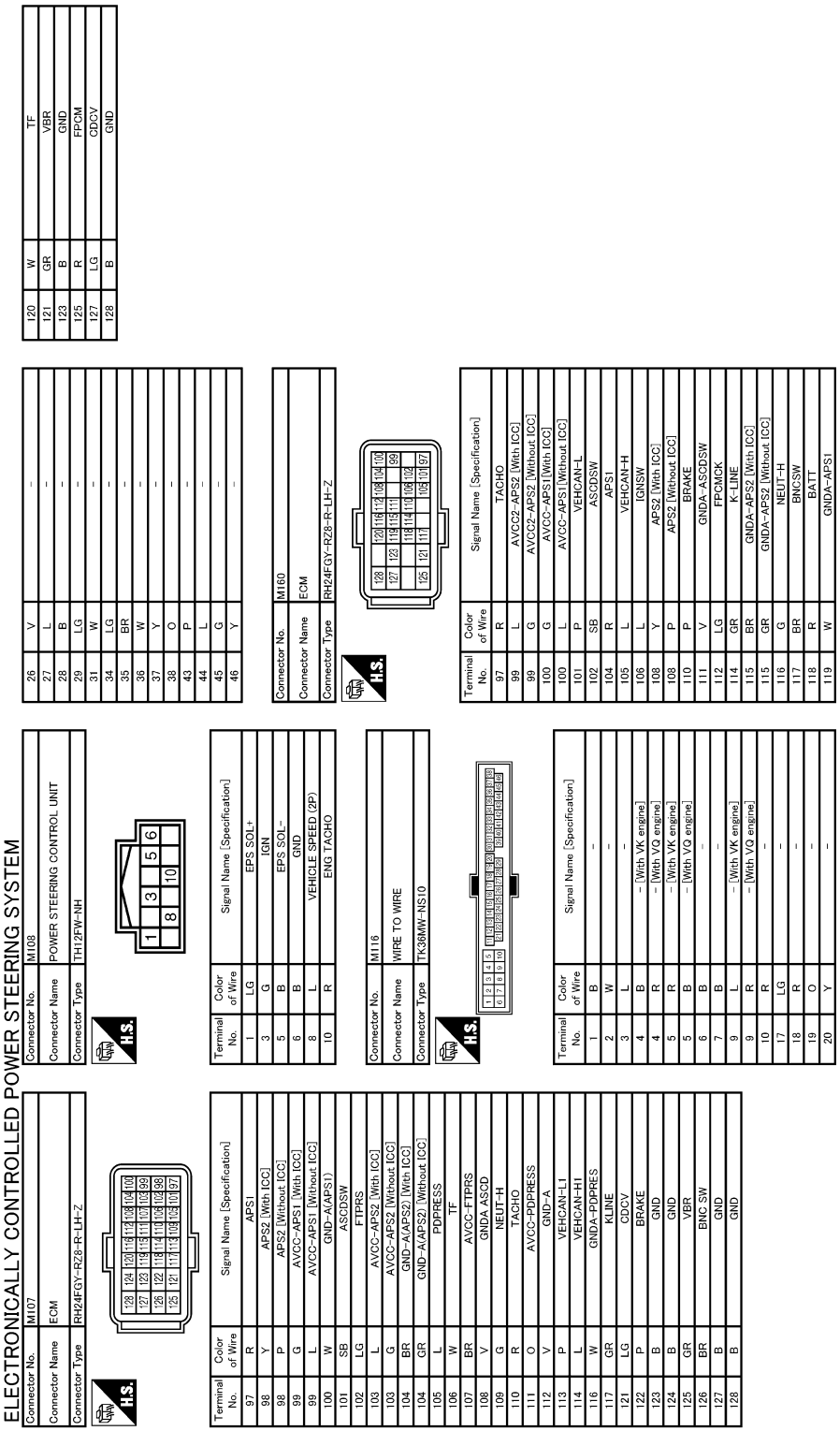

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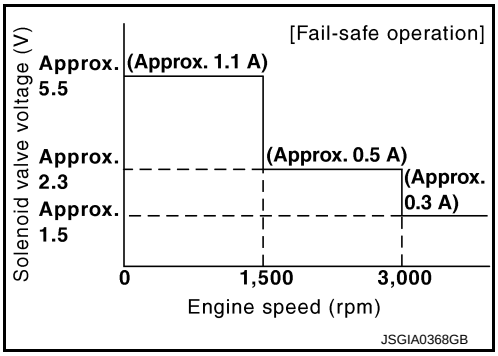
Fail-Safe

INFOID:0000000005235348

EPS system

- EPS system enters the fail-safe mode (that allows the steering force to be controlled without impairing the drivability) if any of the input/output values to/from EPS system (power steering control unit) deviate from the standard range.
  NOTE:
  The system enters the fail-safe mode if the engine speed remains at 1,500 rpm or more for over 10 seconds while the vehicle is stopped. This is normal.
- The fail-safe function is canceled when a vehicle speed signal of 2 km/h (1.2 MPH) or more is inputted or the ignition switch is turned OFF→ON. EPS system restores the normal operation at that time.



Mode	Warning lamp	DTC	Detection point (malfunction part)	Error area and root cause
Fail-safe	—	—	Vehicle speed signal input	• Engine speed is 1,500 rpm or more and there is no vehicle speed signal input for over 10 seconds during vehicle travel. • 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.

SYMPTOM DIAGNOSIS

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

Description

INFOID:0000000005235349

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

Diagnosis Procedure

INFOID:0000000005235350

1. CHECK SYSTEM FOR POWER SUPPLY AND GROUND

Perform trouble diagnosis for power supply and ground. Refer to STC-8, "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-14, "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-11, "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-9, "Diagnosis Procedure".

Is the inspection result normal?

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

PRECAUTION

PRECAUTIONS

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

INFOID:0000000005588469

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 which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS 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:0000000005588470

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.

This vehicle is equipped with a push-button ignition switch and a steering lock unit.
If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. 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.)

REMOVAL AND INSTALLATION

POWER STEERING CONTROL UNIT

Removal and Installation

INFOID:0000000005235354

REMOVAL

1. Remove instrument lower cover RH. Refer to IP-11, "Exploded View".
2. Remove instrument lower panel RH. Refer to IP-11, "Exploded View".
3. Remove power steering control unit.
4. Disconnect power steering control unit connector.

INSTALLATION

Install in the reverse order of removal.

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000005235355

DETAILED FLOW

1.INTERVIEW THE CUSTOMER

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

CAUTION:

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

>> GO TO 2.

2.CHECK SYMPTOM

Reproduce symptoms indicated by the customer, based on information obtained from the interview with the customer. In addition, check if the symptoms are caused by the Fail-safe function and the protective function. Refer to STC-100, "Fail-Safe".

CAUTION:

If the symptoms are normal operation, check each part thoroughly and gain the understanding from the customer, explaining that the symptoms are not malfunction.

>> GO TO 3.

3.CHECK CURRENT STATE

Start the engine.

CAUTION:

Stop the vehicle.

Does RAS warning lamp turn ON?

YES >> GO TO 4.
NO >> GO TO 8.

4.PERFORM SELF-DIAGNOSIS

With CONSULT-III

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

Is any DTC detected?

YES >> Record or print the self-diagnosis results and go to 5.
NO >> GO TO 8.

5.RECHECK SYMPTOM

With CONSULT-III

1. Turn the ignition switch OFF and wait for 10 seconds or more.
2. Record the values of “DATA MONITOR” for each DTC detected by self-diagnosis.
3. Record the values of “FREEZE FRAME DATA” for each DTC detected by self-diagnosis.
4. Erase the memory of self-diagnosis results (history) of “4WAS(MAIN)/RAS/HICAS”.
   CAUTION:
   - **When replacing the RAS control unit according to the self-diagnosis, replace it without erasing self-diagnosis results (history).**
   - **When erasing the memory of the self-diagnosis results (history), print or record all the values of “DATA MONITOR” for each DTC with CONSULT-III to erase the memory of the self-diagnosis result (history).**
5. Perform “DTC CONFIRMATION PROCEDURE” for each malfunction.
   NOTE:

- When multiple DTCs are detected, refer to STC-102, "DTC Inspection Priority Chart" to determine the sequence of performing a self-diagnosis.
- When DTC is not detected, refer to Freeze frame data.

Is any DTC detected?

YES >> GO TO 6.
NO >> Check harness and connector, based on information obtained from the interview with the customer. Refer to GI-36, "Intermittent Incident".

6.REPAIR AND REPLACE PART

1. Repair or replace malfunctioning part.
   CAUTION:
   Securely connect the removed parts and connectors.
2. Erase the memory of self-diagnosis results (history) of “4WAS(MAIN)/RAS/HICAS”.

>> GO TO 7.

7.RECHECK SYMPTOM

With CONSULT-III
Perform “DTC CONFIRMATION PROCEDURE” for each malfunction.
NOTE:
- When multiple DTCs are detected, refer to STC-102, "DTC Inspection Priority Chart" to determine the sequence of performing a self-diagnosis.
- When DTC is not detected, refer to Freeze frame data.

Is any DTC detected?

YES >> GO TO 6.
NO >> GO TO 9.

8.DIAGNOSIS BY SYMPTOM

Estimate and check malfunctioning parts, based on the symptoms obtained from the diagnosis by symptom.

Is a malfunctioning part identified?

YES >> GO TO 9.
NO >> Check harness and connector, based on information obtained from the interview with the customer. Refer to GI-36, "Intermittent Incident".

9.FINAL CHECK

With CONSULT-III
1. Check the input-output reference values of RAS control unit.
2. Recheck the symptom under the same conditions as those for the successfully reproduced malfunction symptom.

Is a malfunction symptom reproduced?

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

Question sheet

INFOID:0000000005566496

DESCRIPTION

There are many operating conditions that may cause a malfunction of the transmission parts. By understanding those conditions properly, a quick and exact diagnosis can be achieved.
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 the concerns carefully. In order to systemize all the information for the diagnosis, prepare the question sheet referring to the question points.

WORKSHEET SAMPLE

Question Sheet						
Customer name MR/MS		Engine #		Manuf. Date		
		Incident Date		VIN		
		Model & Year		In Service Date		
		Trans.		Mileage		km / Mile
Symptoms		☐ steering wheel position (center) is in the wrong position				
		☐ Warning lamp turn ON				
		☐ Noise ☐ Vibration				
		☐ Others				
Frequency		☐ All the time	☐ Under certain conditions		☐ Sometimes (times a day)	
Weather conditions		☐ Not affected				
	Weather	☐ Fine	☐ Clouding	☐ Raining	☐ Snowing	☐ Other ( )
	Temp.	☐ Hot	☐ Warm	☐ Cool	☐ Cold	☐ Temp. [Approx. °C (°F)]
	Humidity	☐ High	☐ Middle	☐ Low		
Road conditions		☐ Not affected				
		☐ In town	☐ In suburbs	☐ Freeway	☐ Off road (Up / Down)	
Driving conditions		☐ Not affected				
		☐ At starting	☐ While idling	☐ While engine racing	☐ At racing	☐ While cruising
		☐ While accelerating		☐ While decelerating	☐ While turning (Right / Left)	
		☐ Vehicle speed [km/h (MPH)]				
Other conditions						

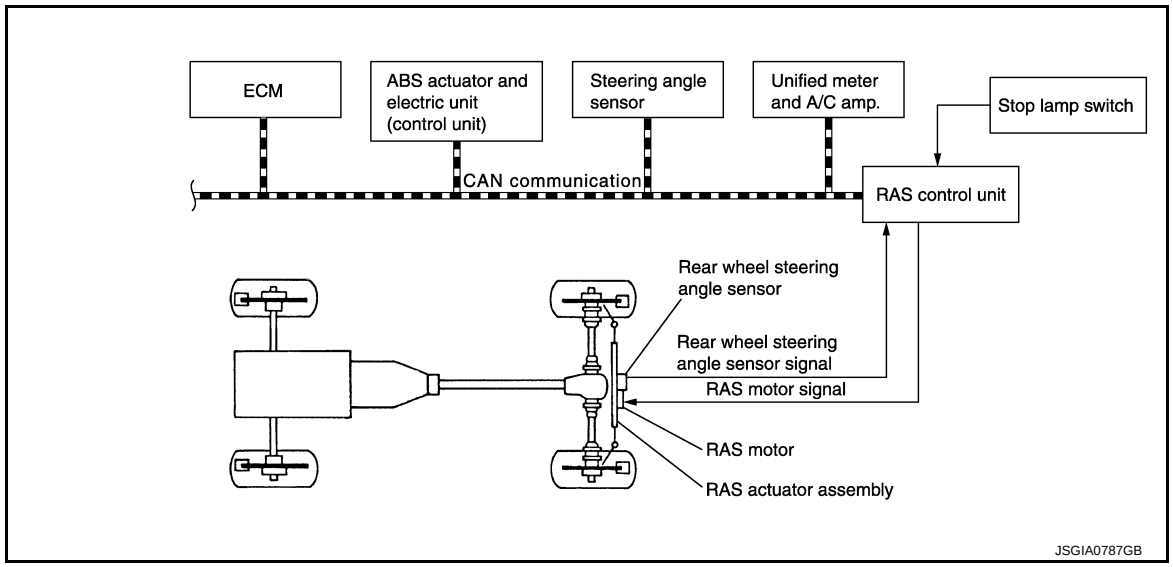
SYSTEM DESCRIPTION

RAS SYSTEM

System Diagram

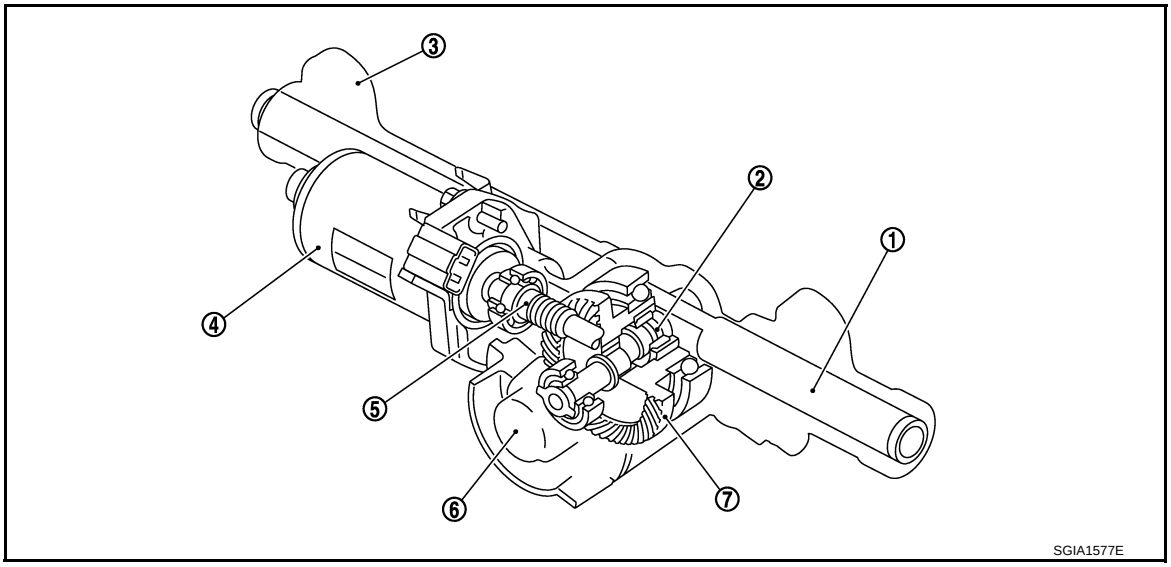
INFOID:0000000005235356

CONTROL DIAGRAM



CROSS-SECTIONAL VIEW

RAS Actuator



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

System Description

INFOID:0000000005235357

DESCRIPTION

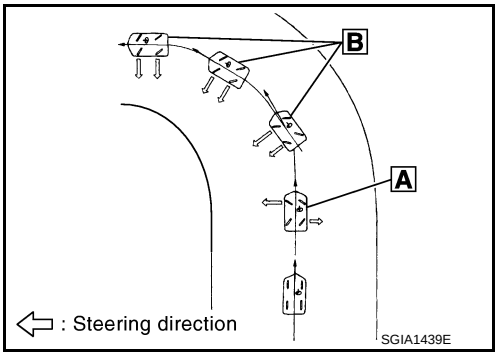
- RAS control unit controls the rear active steer.
- RAS system consists of RAS control unit and RAS actuator components.
- RAS control unit controls the RAS actuator assembly according to the steering angle and vehicle speed.
- Self-diagnosis can be performed with CONSULT-III at each control unit to another RAS control unit.

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

Component parts	Function
Steering angle sensor	It mainly transmits the following signals to RAS control unit via CAN communication. • Steering angle sensor signal
ABS actuator and electronic unit (control unit)	It mainly transmits the following signals to RAS control unit via CAN communication. • Vehicle speed signal • VDC malfunction signal
ECM	It mainly transmits the following signals to RAS control unit via CAN communication. • Engine speed signal
Unified meter and A/C amp.	It mainly transmits the following signals from RAS control unit via CAN communication. • RAS warning lamp signal

Model Following Control

• Situation A:
The rear wheels turn to the opposite phase of front wheels for a moment so as to improve the start-up of yaw rate (steering angle speed).
• Situation B:
The rear wheels turn to the same phase of front wheels after securing the necessary yaw rate (steering angle speed) to cornering.

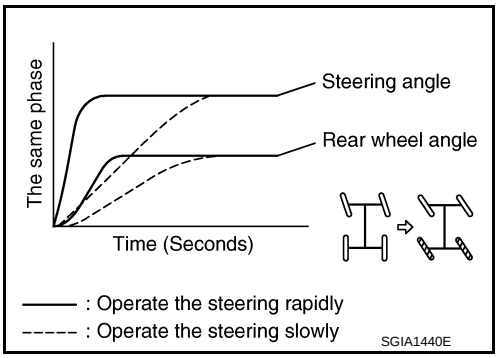


OPERATION DESCRIPTION

The rear wheel angle changes as per the following:

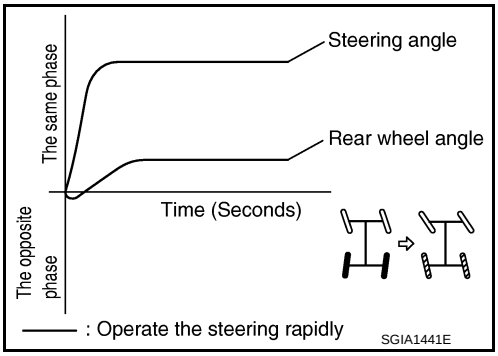
During high-speed driving

• The rear wheels turn to the same phase of front wheels regardless of the operation speed of steering wheel.

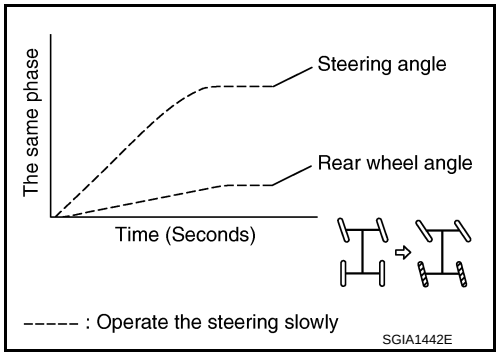


During middle- low-speed driving

• When turning the steering wheel rapidly, the rear wheels turn to the opposite phase of front wheels for a moment just after starting the steering wheel operation. And then, they turn to the same phase.



- The rear wheels turn to the same phase of front wheels when turning the steering wheel slowly.



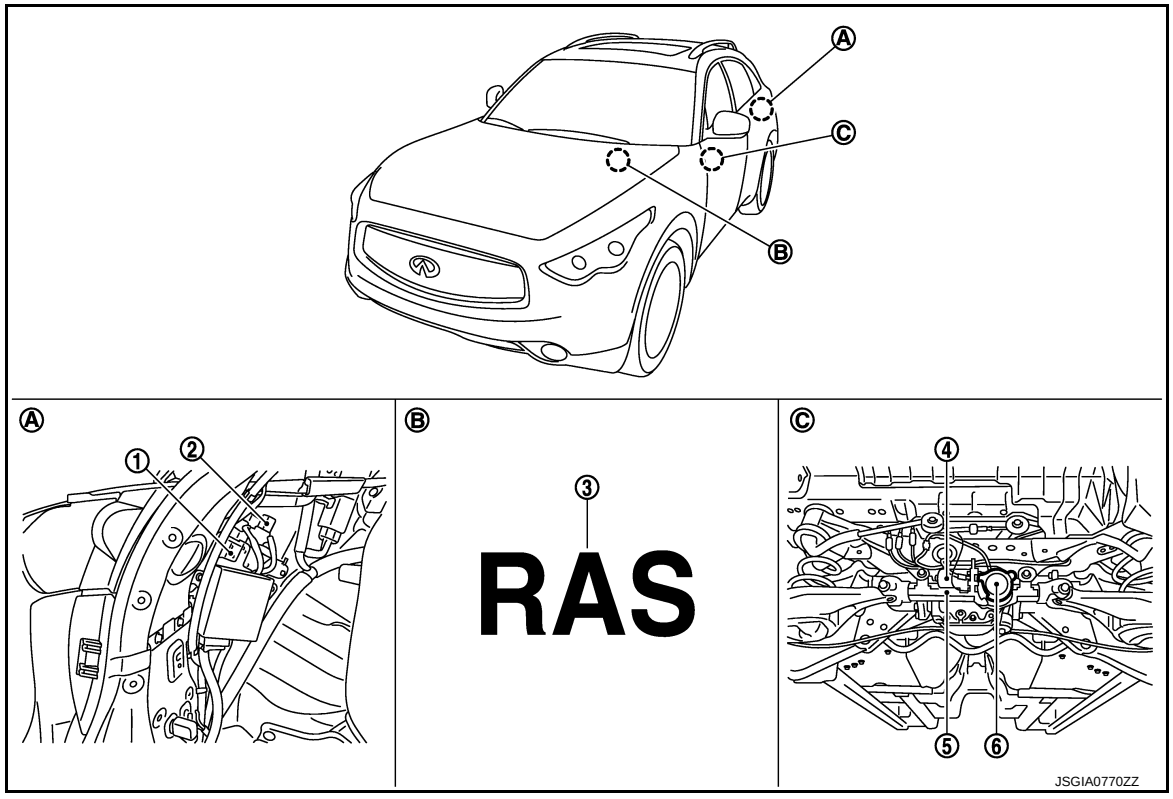
During extremely slow-speed driving and at straight-ahead driving
- The rear wheels do not turn during extremely slow-speed driving regardless of the operation speed of steering wheel.
- The rear wheels do not turn at straight-ahead driving regardless of the vehicle speed.

OPERATION FEATURE

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

Component Parts Location

INFOID:0000000005235358



1. RAS control unit
2. RAS motor relay
3. RAS warning lamp
4. RAS rear motor
5. RAS rear actuator
6. Rear wheel steering angle sensor

A. Inside the rear wheel house finisher (left)
B. Inside combination meter
C. RAS rear actuator assembly

Component Description

INFOID:0000000005235359

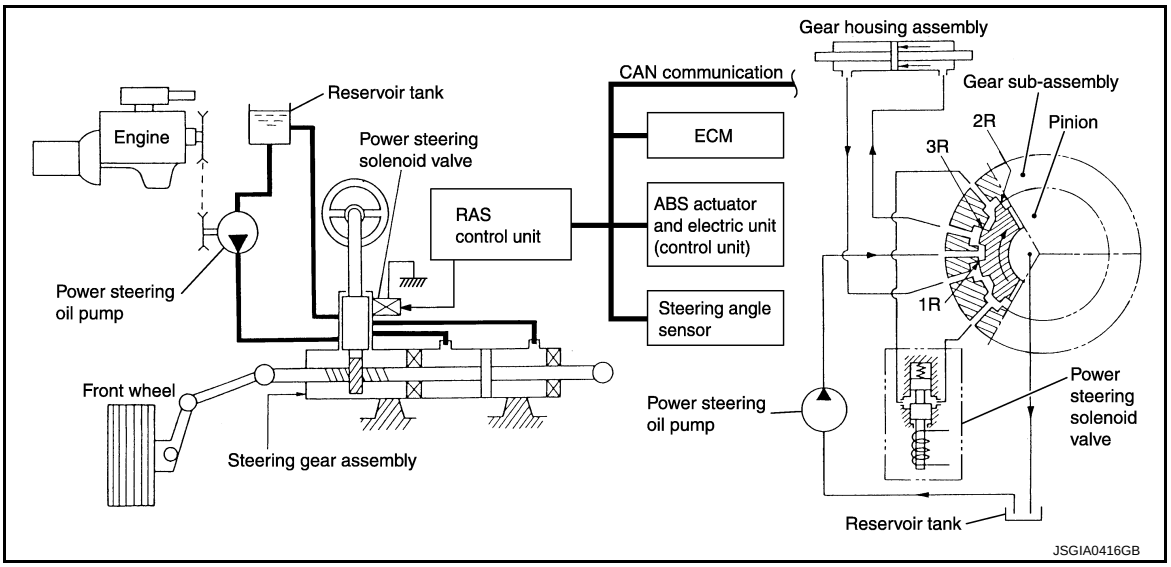
Component parts	Reference/Function
Steering angle sensor	STC-67, "Description"
RAS control unit	STC-50, "Description"
RAS actuator	The rear wheel steering angle is activated.
Rear wheel steering angle sensor	STC-56, "Description"
RAS motor	STC-44, "Description"
ABS actuator and electronic unit (control unit)	STC-65, "Description"
ECM	STC-69, "Description"
Power steering solenoid valve	STC-83, "Description"
RAS warning lamp	STC-85, "Description"
Stop lamp switch	This switch is used for self-diagnosis without CONSULT-III.

EPS SYSTEM

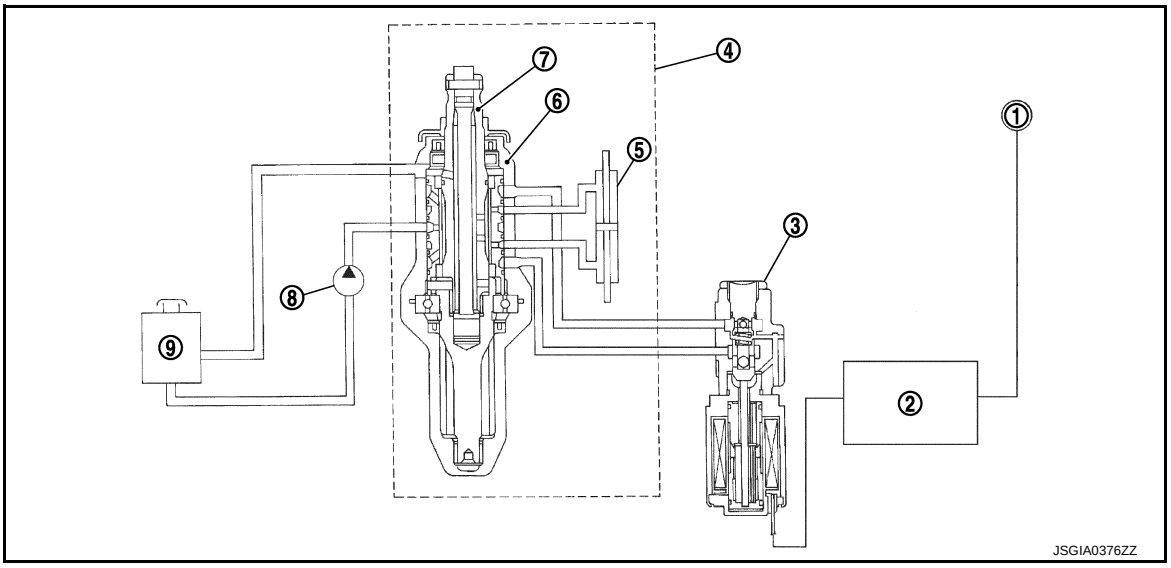
System Diagram

INFOID:0000000005235360

CONTROL DIAGRAM



CROSS-SECTIONAL VIEW



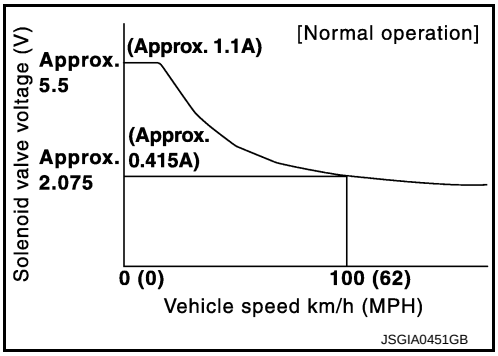
1. Unified meter and A/C amp.
2. RAS control unit
3. Power steering solenoid valve
4. Steering gear assembly
5. Gear housing assembly
6. Gear sub-assembly
7. Pinion
8. Power steering oil pump
9. Reservoir tank

System Description

INFOID:0000000005235361

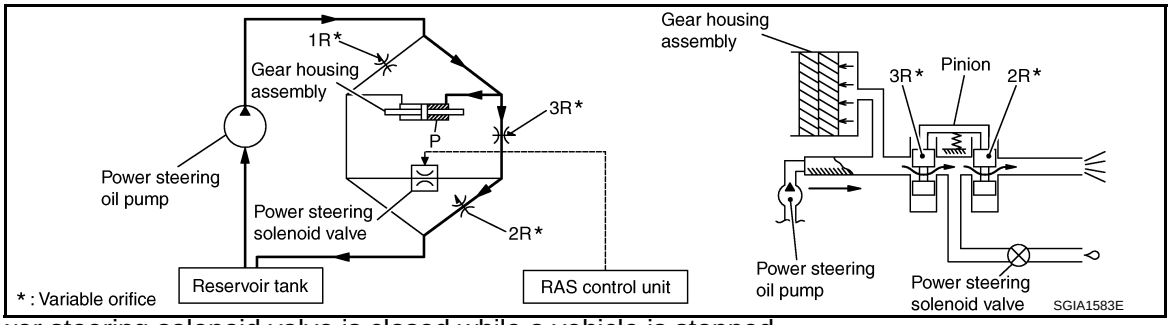
- The EPS system controls the power steering solenoid valve through the RAS control unit.

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



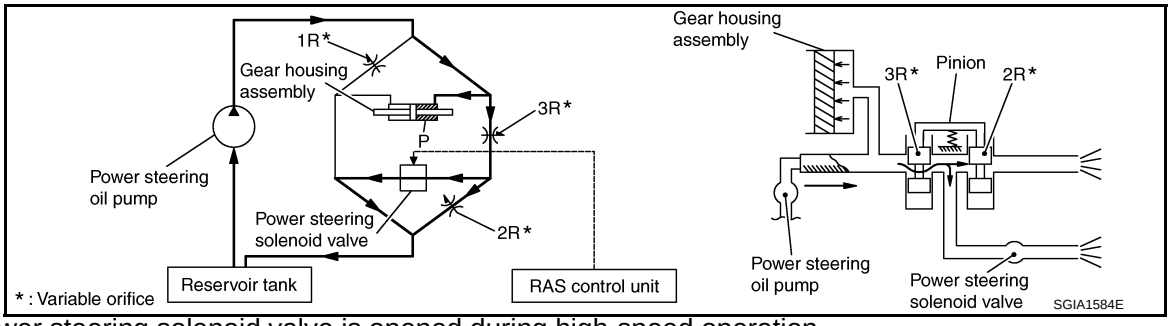
OPERATION PRINCIPLE

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



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

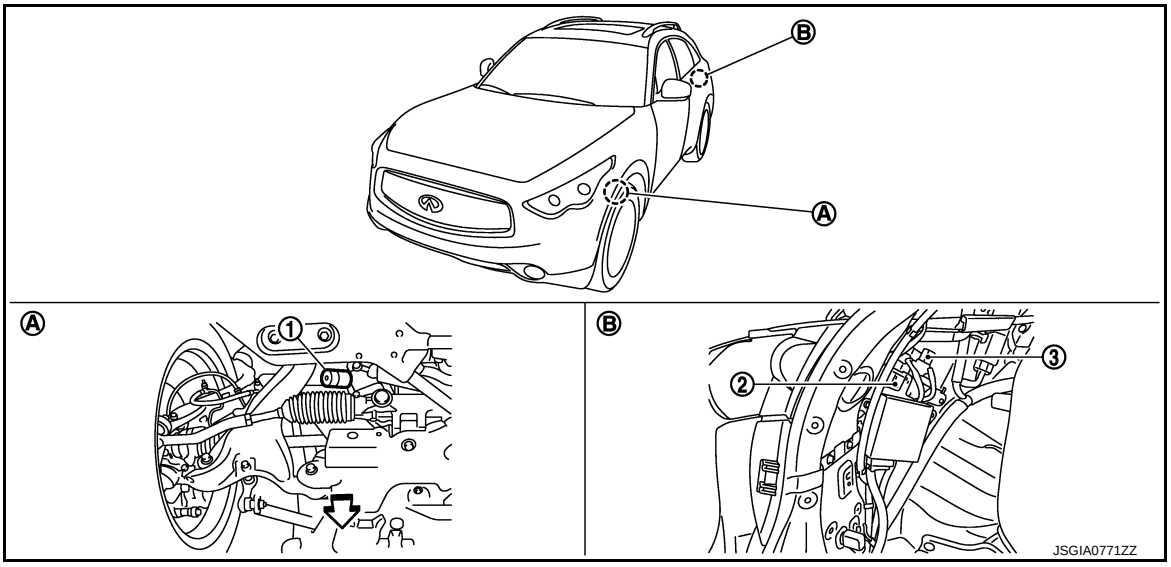
During High-speed Operation



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

Component Parts Location

INFOID:0000000005235362



1. Power steering solenoid valve
2. RAS control unit
3. RAS motor relay
A. Steering gear assembly
B. Inside the rear wheel house finisher (Left)

⇦: Vehicle front

Component Description

INFOID:0000000005235363

Component parts	Reference/Function
RAS control unit	• The power steering solenoid valve activation voltage is controlled by each sensor signal. • The power steering solenoid valve activation voltage is controlled by RAS control unit for maintaining the power steering force in the fail-safe mode. (EPS system is controlled by the engine speed signal if the vehicle speed signal error is detected.)
ABS actuator and electric unit (control unit)	STC-65, "Description"
ECM	STC-69, "Description"
Power steering solenoid valve	STC-83, "Description"

DIAGNOSIS SYSTEM (RAS CONTROL UNIT)

Diagnosis Description

INFOID:0000000005235364

DESCRIPTION

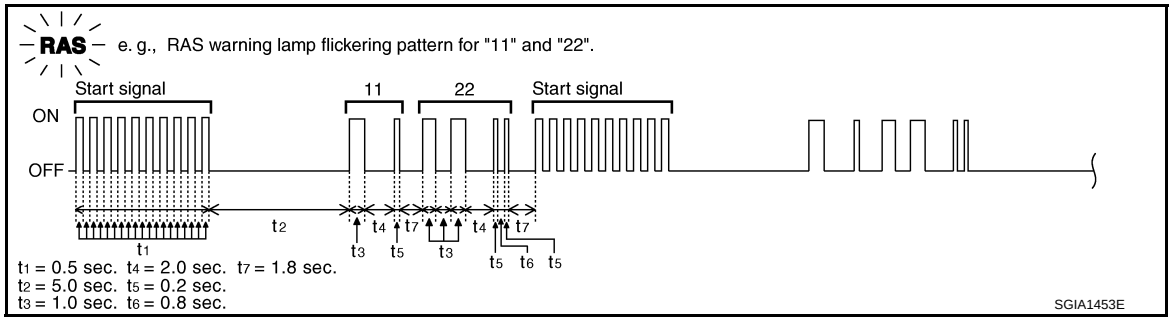
The RAS warning lamp in the combination meter will flicker according to the self-diagnostic results. As for the details of the RAS warning lamp flickering patterns.

DIAGNOSTIC PROCEDURE

1. Start the engine.
2. Perform the following procedure within 10 seconds after engine start.
   - Turn steering wheel left and right at 20° or more and 5 times
   - Depress the brake pedal 5 times or more
3. Read the flickering of RAS warning lamp.
   NOTE:
   When the RAS warning lamp flashes 4 Hz and continues repeating it, the system is normal.

JUDGMENT SELF-DIAGNOSIS CODE

When a malfunction is detected, the malfunction route is indicated by flickering of the RAS warning lamp.



NOTE:
When the RAS warning lamp flashes 4 Hz and continues repeating it, the system is normal.

Flickering pattern	Display items	Malfunction detected condition	Check item
11	RAS control unit	Malfunction has occurred inside RAS control unit.	STC-42, STC-48 or STC-50
12	Motor power supply	Battery voltage circuit malfunction of RAS motor	STC-52
13	Motor output	When the RAS motor current value is 10 A or more, actual output is excessively low and the condition continues for some time.	STC-44
21	Vehicle speed signal	• Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) via CAN communication. • Improper signal is input vehicle speed.	STC-65
22	Steering angle sensor signal	• Malfunction is detected in steering angle sensor signal that is output from steering angle sensor via CAN communication. • Improper signal is input steering angle sensor.	STC-67, STC-71, STC-73 or STC-75
24	Rear wheel steering angle (main)	• The rear wheel steering angle sensor (main) output signal is malfunctioning. • The rear wheel steering angle sensor (main) power supply value is malfunction. • The output signal value differs between rear wheel steering angle sensor (main) and (sub).	STC-56, STC-59 or STC-62
25	Rear wheel steering angle (sub)	• The rear wheel steering angle sensor (sub) output signal is malfunctioning. • The rear wheel steering angle sensor (sub) power supply value is malfunction. • The output signal value differs between rear wheel steering angle sensor (main) and (sub).	STC-56, STC-59 or STC-62

Flickering pattern	Display items	Malfunction detected condition	Check item
26	VDC	• Malfunction is detected in VDC malfunction signal that is output from ABS actuator and electric unit (control unit) via CAN communication. • ABS actuator and electric unit (control unit) outputs the malfunction signal. • Improper signal is input VDC malfunction signal.	STC-77
33	Engine speed signal	• Malfunction is detected in engine speed signal that is output from ECM via CAN communication. • Improper signal is input engine speed.	STC-69
No flickering	Stop lamp switch	Stop lamp switch circuit is shorted or open.	STC-87

ERASE SELF-DIAGNOSIS

- In order to make it easier to find the cause of hard-to-duplicate malfunctions, malfunction information is stored into the control unit as necessary during use by the user. This memory is not erased no matter how many times the ignition switch is turned ON and OFF.
- However, this information is erased or by erasing the memory using the CONSULT-III.

CONSULT-III Function

INFOID:0000000005235365

FUNCTION

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

Diagnostic test mode	Function
ECU identification	RAS control unit part number can be read.
Self-diagnostic results	• Self-diagnostic results can be read and erased quickly. • A vehicle state can be stored when a DTC is detected. (Freeze frame data)
Data monitor	Input/Output data in the RAS control unit can be read.
Active test	Diagnostic Test Mode in which CONSULT-III drives some actuators apart from the RAS control unit and also shifts some parameters in a specified range.

SELF-DIAG RESULT MODE

Display Item List

Refer to STC-102, "DTC Index".

FREEZE FRAME DATA (FFD)

RAS control unit can record the following information when a DTC is detected.

Freeze Frame Data Item	Description
VHCL SPEED SE	A vehicle speed at malfunction detection is indicated.
STEERING ANG	A steering angle at malfunction detection is indicated.
ENGINE SPEED	A engine speed at malfunction detection is indicated.
POWER STR SOL	A current value of the power steering solenoid valve at malfunction detection is indicated.
RR ST ANG-MAI	A voltage of the rear wheel steering angle sensor (main) at malfunction detection is indicated.
RR ST ANG-SUB	A voltage of the rear wheel steering angle sensor (sub) at malfunction detection is indicated.
RR ST ANG-VOL	A power supply voltage of the rear wheel steering angle sensor at malfunction detection is indicated.
C/U VOLTAGE	A power supply voltage value of RAS control unit at malfunction detection is indicated.
MOTOR VOLTAGE	A voltage value of RAS motor at malfunction detection is indicated.
MOTOR CURRENT	A current value of RAS motor at malfunction detection is indicated.
MTR CRNT OPE	A current value input to RAS motor at malfunction detection is indicated.

Freeze Frame Data Item	Description
RR ANGLE OPE	A angle command value is indicated for activating RAS motor at malfunction detection is indicated.
STOP LAMP SW	A stop lamp switch status at malfunction detection is indicated.
HICAS RELAY	A RAS motor relay condition at malfunction detection is indicated.
FAILSAFE	A fail-safe mode status of RAS control unit at malfunction detection is indicated.
WARNING LAMP	A RAS warning lamp condition at malfunction detection is indicated.

DATA MONITOR MODE

Display Item List

Monitor item (Unit)	Remarks
VHCL SPEED SE [km/h] or [mph]	The vehicle speed signal from ABS actuator and electric unit (control unit) is indicated via CAN communication line.
STEERING ANG [°]	The steering angle sensor signal from the steering angle sensor is indicated via CAN communication line.
ENGINE SPEED [rpm]	The engine speed signal from ECM is indicated via 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 RAS control unit is indicated.
MOTOR VOLTAGE [V]	The voltage value of RAS motor is indicated.
MOTOR CURRENT [A]	The current value of RAS motor is indicated.
MTR CRNT OPE [A]	The current value input to RAS motor is indicated.
RR ANGLE OPE [°]	The angle command value is indicated for activating RAS motor.
STOP LAMP SW [On/Off]	The stop lamp switch status is indicated.
HICAS RELAY [On/Off]	RAS motor relay condition is indicated.
FAILSAFE [On/Off]	The fail-safe mode status of RAS control unit is indicated.
WARNING LAMP [On/Off]	RAS warning lamp ON/OFF condition is indicated.

ACTIVE TEST MODE

Description

- RAS actuator assembly activation is checked according to the control signal from CONSULT-III.
- The control signal forcibly activates (ON/OFF) RAS actuator 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.**	RAS actuator assembly activates. It activates in the same direction as the steering angle by inputting the steering angle.
	OFF	RAS 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

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

DTC/CIRCUIT DIAGNOSIS

C1900, C1901, C1906, C1907, C1927, C1933 RAS CONTROL UNIT

Description

INFOID:0000000005549661

- RAS actuator and the power steering solenoid valve is controlled by each sensor signal.
- The fail-safe function stops the rear wheel angle function, when the electric components and the mechanical components are malfunctioning.
- The protective function stops RAS system temporarily when the input signal is not inputted to RAS control unit (When battery-power dose not work temporarily).

DTC Logic

INFOID:0000000005549662

DTC DETECTION LOGIC

DTC	Display Items	Malfunction detected condition	Possible cause
C1900	CONTROL UNIT [ABNORMAL1]	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector
C1901	CONTROL UNIT [ABNORMAL2]	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector
C1906	CONTROL UNIT [ABNORMAL5]	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector
C1907	CONTROL UNIT [ABNORMAL4]	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector
C1927	CONTROL UNIT [ABNORMAL5]	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector
C1933	CONTROL UNIT	Malfunction has occurred inside RAS control unit.	RAS control unit

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

With CONSULT-III

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1900”, “C1901”, “C1906”, “C1907”, “C1927”, “C1933” or “RAS warning lamp flickering pattern:11” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-42, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005549663

1. PERFORM SELF-DIAGNOSIS

With CONSULT-III

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1900”, “C1901”, “C1906”, “C1907”, “C1927”, “C1933” or “RAS warning lamp flickering pattern:11” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 2.

2.CHECK INFORMATION

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the “self-diagnosis function. Refer to STC-89, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

Special Repair Requirement

INFOID:0000000005549664

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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 RAS MOTOR OUTPUT

Description

INFOID:0000000005549665

- RAS motor activates RAS 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:0000000005549666

DTC DETECTION LOGIC

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

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

With CONSULT-III

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1902”, “C1903”, “C1904”, “C1910”, “C1913” or “RAS warning lamp flickering pattern:13” detected?

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

Diagnosis Procedure

INFOID:0000000005549667

1. CHECK RAS MOTOR CIRCUIT

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

RAS control unit		RAS motor		Continuity
Connector	Terminal	Connector	Terminal	
B37	38	B54	1	Existed
	39		2	

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

RAS control unit		—	Continuity
Connector	Terminal		
B37	38	Ground	Not existed
	39		

Is the inspection result normal?

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

2.CHECK RAS MOTOR

Check RAS motor. Refer to STC-46, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace RAS actuator assembly. Refer to STC-110, "Exploded View".

3.PERFORM ACTIVE TEST

With CONSULT-III

1. Connect RAS control unit harness connector.
2. Connect RAS motor harness connector.
3. Perform “SELF DIAGNOSTIC MODE” item on “ACTIVE TEST” of “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	RAS motor running	0 – 20 A
MTR CRNT OPE	RAS actuator neutral condition and vehicle straight-ahead position	Approx. –2 – 2 A
	RAS motor running	Approx. –20 – 20 A

Without CONSULT-III

1. Disconnect RAS control unit harness connector.
2. Disconnect RAS motor harness connector.
3. Start the engine.
4. Check the voltage between RAS control unit harness connector and ground.

RAS control unit		—	Condition	Voltage (Approx.)
Connector	Terminal			
B37	38	Ground	While RAS motor is operation for right	Battery voltage
			While RAS motor is operation for left	0V
	39		While RAS motor is operation for right	0V
			While RAS motor is operation for left	Battery voltage

Is the standard value?

YES >> GO TO 4.
NO >> Replace RAS actuator assembly. Refer to STC-110, "Exploded View".

4. PERFORM SELF-DIAGNOSIS

With CONSULT-III

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

Without CONSULT-III

1. Connect RAS control unit harness connector.
2. Connect RAS motor harness connector.
3. Start the engine.
4. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1902”, “C1903”, “C1904”, “C1910” or “RAS warning lamp flickering pattern:13” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 5.

5. CHECK INFORMATION

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

Component Inspection

INFOID:0000000005549668

1. CHECK RAS MOTOR

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

RAS motor	Continuity
Terminal	
1 – 2	Existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace RAS actuator assembly. Refer to STC-110, "Exploded View".

Special Repair Requirement

INFOID:0000000005549669

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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 RAS CONTROL UNIT

Description

INFOID:0000000005549670

- RAS actuator and the power steering solenoid valve is controlled by each sensor signal.
- The fail-safe function stops the rear wheel angle function, when the electric components and the mechanical components are malfunctioning.
- The protective function stops RAS system temporarily when the input signal is not inputted to RAS control unit (When battery-power dose not work temporarily).

DTC Logic

INFOID:0000000005549671

DTC DETECTION LOGIC

DTC	Display items	Malfunction detected condition	Possible cause
C1905	CONTROL UNIT [ABNORMAL3]	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector
C1908	CONTROL UNIT [ABNORMAL7]	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector
C1922	CONTROL UNIT [ABNORMAL8]	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector
C1925	AD CONVERTER	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector
C1928	CONTROL UNIT [ABNORMAL9]	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1905”, “C1908”, “C1922”, “C1925”, “C1928” or “RAS warning lamp flickering pattern:11” detected?

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

Diagnosis Procedure

INFOID:0000000005549672

1.PERFORM SELF-DIAGNOSIS

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1905”, “C1908”, “C1922”, “C1925”, “C1928” or “RAS warning lamp flickering pattern:11” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 2.

2.CHECK INFORMATION

With CONSULT-III
1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.

2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

Special Repair Requirement

INFOID:0000000005549673

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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 RAS CONTROL UNIT

Description

INFOID:0000000005549674

- RAS actuator and the power steering solenoid valve is controlled by each sensor signal.
- The fail-safe function stops the rear wheel angle function, when the electric components and the mechanical components are malfunctioning.
- The protective function stops RAS system temporarily when the input signal is not inputted to RAS control unit (When battery-power dose not work temporarily).

DTC Logic

INFOID:0000000005549675

DTC DETECTION LOGIC

DTC	Display items	Malfunction detected condition	Possible cause
C1909	CONTROL UNIT [ABNORMAL6]	Malfunction has occurred inside RAS control unit.	• RAS control unit • Harness or connector

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

With CONSULT-III

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1909” or “RAS warning lamp flickering pattern:11” detected?

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

Diagnosis Procedure

INFOID:0000000005549676

1. CHECK RAS CONTROL UNIT POWER SUPPLY

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

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	27	Ground	0 V

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

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	27	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NG >> Check the following items. Repair or replace the malfunctioning parts.
- 10A fuse (#45) open
- Short among 10A fuse (#45) connector, RAS control unit harness connector No. 27 terminal and the ground

- Open between the ignition switch and RAS control unit harness connector No. 27 terminal
- Ignition switch

2.CHECK RAS CONTROL UNIT GROUND

Check the continuity between RAS control unit harness connector and ground.

RAS control unit		—	Continuity
Connector	Terminal		
B37	34	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.
NG >> Repair or replace the harnesses and connectors.

3.PERFORM SELF-DIAGNOSIS

With CONSULT-III

1. Connect RAS control unit harness connector.
2. Turn the ignition switch from OFF to ON.
3. Perform “4WAS(MAIN)/RAS/HICAS” self-diagnosis.

Without CONSULT-III

1. Connect RAS control unit harness connector.
2. Start the engine.
3. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1909” or “RAS warning lamp flickering pattern:11” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 4.

4.CHECK INFORMATION

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

Special Repair Requirement

INFOID:0000000005549677

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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 RAS MOTOR POWER SUPPLY

Description

INFOID:0000000005549678

The power supply for RAS motor.

DTC Logic

INFOID:0000000005549679

DTC DETECTION LOGIC

DTC	Display items	Malfunction detected condition	Possible cause
C1911	MOTOR VOLTAGE [LOW VOLTAGE]	RAS motor voltage error is detected. (RAS motor voltage is low.)	• RAS motor relay • Harness or connector • RAS control unit
C1912	MOTOR VOLTAGE [BAD OBSTRCT]	RAS motor voltage error is detected. (Voltage is applied to RAS motor when RAS control unit output is “OFF”.)	• RAS motor relay • Harness or connector • RAS control unit

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

With CONSULT-III

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1911”, “C1912” or “RAS warning lamp flickering pattern:12” detected?

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

Diagnosis Procedure

INFOID:0000000005549680

1. CHECK RAS CONTROL UNIT POWER SUPPLY

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

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	27	Ground	0 V

4. Turn the ignition switch ON.

CAUTION:
Never start the engine.

5. Check the voltage between RAS control unit harness connector and ground.

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	27	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NG >> Check the following items. Repair or replace the malfunctioning parts.
- 10A fuse (#45) open
- Short among 10A fuse (#45) connector, RAS control unit harness connector No. 27 terminal and the ground

- Open between the ignition switch and RAS control unit harness connector No. 27 terminal
- Ignition switch

2. CHECK RAS MOTOR POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Remove RAS motor relay.
3. Check the continuity between RAS motor relay harness connector and ground.

RAS motor relay		—	Continuity
Connector	Terminal		
B36	2	Ground	Existed
	1		Not existed

4. Check the continuity between RAS motor relay harness connector and RAS control unit harness connector.

RAS motor relay		RAS control unit		Continuity
Connector	Terminal	Connector	Terminal	
B36	1	B37	25	Existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the harnesses and connectors.

3. CHECK RAS MOTOR POWER SUPPLY CIRCUIT (2)

Check the voltage between RAS motor relay harness connector and ground.

RAS motor relay		—	Voltage (Approx.)
Connector	Terminal		
B36	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Check the following items. Repair or replace the malfunctioning parts.
- 20A fuse (#37) open
- Short among 20A fuse (#37) connector, RAS motor relay harness connector No. 3 terminal and the ground
- Open between the battery and RAS motor relay harness connector No. 3 terminal

4. CHECK RAS MOTOR POWER SUPPLY CIRCUIT (3)

1. Connect RAS control unit harness connector.
2. Turn the ignition switch ON.

CAUTION:
Never start the engine.

3. Check the voltage between RAS control unit harness connector and ground.

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	25	Ground	Battery voltage

4. Turn the ignition switch OFF.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

5. CHECK RAS MOTOR RELAY

Check the RAS motor relay. Refer to STC-54, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Replace RAS motor relay.

6.CHECK RAS MOTOR POWER SUPPLY

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

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	37	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

7.PERFORM SELF-DIAGNOSIS (RAS CONTROL UNIT)

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1911”, “C1912” or “RAS warning lamp flickering pattern:12” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-52, "Diagnosis Procedure".
NO >> GO TO 8.

8.CHECK INFORMATION

With CONSULT-III
1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

Component Inspection

INFOID:0000000005549681

1.CHECK RAS MOTOR RELAY

1. Turn the ignition switch OFF.
2. Disconnect RAS motor relay harness connector.
3. Apply 12 V to RAS 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 RAS motor relay connector.

RAS 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 RAS motor relay connector.

RAS motor relay		Resistance (Approx.)
Terminal		
1	2	50 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace RAS motor relay.

Special Repair Requirement

INFOID:0000000005549683

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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

Description

INFOID:0000000005549684

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

DTC Logic

INFOID:0000000005549685

DTC DETECTION LOGIC

DTC	Display items	Malfunction detected condition	Possible cause
C1914	RR ST ANGLE SENSOR [ABNORML VOL]	The rear wheel angle sensor (main) or (sub) power supply value is malfunction.	• RAS actuator assembly (Rear wheel angle sensor) • Harness or connector • RAS control unit

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

With CONSULT-III

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1914” or “RAS warning lamp flickering pattern:24” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-56, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005549686

1.CHECK REAR WHEEL STEERING ANGLE SENSOR POWER SUPPLY

1. Turn the ignition switch OFF.
2. Check the voltage between RAS control unit harness connector and ground.

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	5	Ground	0 V

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

RAS control unit		—	Value (Approx.)
Connector	Terminal		
B37	5	Ground	5 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

2.CHECK REAR WHEEL STEERING ANGLE SENSOR

Check the rear wheel steering angle sensor. Refer to STC-57, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace RAS actuator assembly. Refer to STC-110, "Exploded View".

3. CHECK REAR WHEEL STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect RAS control unit harness connector.
2. Check the continuity between RAS control unit harness connector and rear wheel steering angle sensor harness connector.

RAS control unit		Rear wheel steering angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
B37	5	B53	1	Existed
	5		4	Not existed
	15		4	Existed
	15		1	Not existed

Is the inspection result normal?

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

4. PERFORM SELF-DIAGNOSIS

1. Connect RAS control unit harness connector.
2. Connect the rear wheel steering angle sensor harness connector.

With CONSULT-III

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1914” or “RAS warning lamp flickering pattern:24” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 5.

5. CHECK INFORMATION

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "Reference Value".

Is each data the standard value?

YES >> Check each harness connector pin terminal for disconnection.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

Component Inspection

INFOID:0000000005549687

1. CHECK REAR WHEEL STEERING ANGLE SENSOR

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

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 RAS actuator assembly. Refer to STC-110, "Exploded View".

Special Repair Requirement

INFOID:0000000005549688

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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

Description

INFOID:0000000005549689

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

DTC Logic

INFOID:0000000005549690

DTC DETECTION LOGIC

DTC	Display items	Malfunction detected condition	Possible cause
C1915	RR ST ANGLE SENSOR [MAIN SIGNAL]	The rear wheel angle sensor signal (main) output signal is malfunction.	• RAS actuator assembly (Rear wheel angle sensor) • Harness or connector • RAS control unit
C1916	RR ST ANGLE SENSOR [SUB SIGNAL]	The rear wheel angle sensor signal (sub) output signal is malfunction.	• RAS actuator assembly (Rear wheel angle sensor) • Harness or connector • RAS control unit

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1915”, “C1916” or “RAS warning lamp flickering pattern:24” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-59, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

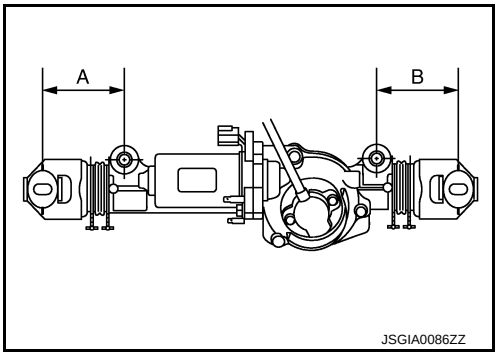
INFOID:0000000005549691

1.CHECK RAS REAR ACTUATOR

1. Turn the ignition switch OFF.
2. Measure (A) and (B) of RAS actuator assembly as shown in the figure.

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

YES >> GO TO 2.
NO >> Replace RAS actuator assembly. Refer to STC-110, "Exploded View".



2.CHECK REAR WHEEL STEERING ANGLE SENSOR (1)

With CONSULT-III
1. Start the engine.
   CAUTION:
   Check condition with the vehicle stopped.
2. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.

3. Check DATA MONITOR “RR ST ANG-MAI” and “RR ST ANG-SUB” value of RAS 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 RAS actuator assembly. Refer to STC-110, "Exploded View".

3.CHECK REAR WHEEL STEERING ANGLE SENSOR (2)

Check the voltage between RAS control unit harness connector and ground.

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	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 RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 4.

4.CHECK REAR WHEEL STEERING ANGLE SENSOR (3)

1. Check the rear wheel steering angle sensor. Refer to STC-61, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace RAS actuator assembly. Refer to STC-110, "Exploded View".

5.CHECK REAR WHEEL STEERING ANGLE SENSOR GROUND CIRCUIT

1. Disconnect RAS control unit harness connector.
2. Check for continuity between RAS control unit harness connector and rear wheel steering angle sensor harness connector.

RAS control unit		Rear wheel steering angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
B37	4	B53	1, 2, 4	Not existed
	4		3	Existed
	7		1, 3, 4	Not existed
	7		2	Existed
	5		2, 3, 4	Not existed
	5		1	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

1. Connect RAS control unit harness connector.
2. Connect the rear wheel steering angle sensor harness connector.

With CONSULT-III

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1915”, “C1916” or “RAS warning lamp flickering pattern:24” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 7.

7. CHECK INFORMATION

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "Reference Value".

Is each data standard?

YES >> Check pin terminal and connection of each harness connector for non-standard conditions.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

Component Inspection

INFOID:0000000005549692

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.

Rear wheel steering angle sensor Terminal		Resistance (Approx.)
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 RAS actuator assembly. Refer to STC-110, "Exploded View".

Special Repair Requirement

INFOID:0000000005549693

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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

Description

INFOID:0000000005549694

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

DTC Logic

INFOID:0000000005549695

DTC DETECTION LOGIC

DTC	Display items	Malfunction detected condition	Possible cause
C1917	RR ST ANGLE SENSOR [OFFSET SIG1]	The output signal value differs temporarily between rear wheel steering angle sensor (main) and (sub).	• RAS actuator assembly (Rear wheel angle sensor) • Harness or connector • RAS control unit
C1918	RR ST ANGLE SENSOR [OFFSET SIG2]	The output signal value differs between rear wheel steering angle sensor (main) and (sub).	• RAS actuator assembly (Rear wheel angle sensor) • Harness or connector • RAS control unit

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

With CONSULT-III

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1917”, “C1918” or “RAS warning lamp flickering pattern:24” detected?

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

Diagnosis Procedure

INFOID:0000000005549696

1. CHECK REAR WHEEL STEERING ANGLE SENSOR (1)

With CONSULT-III

1. Start the engine.
   CAUTION:
   Check condition with the vehicle stopped.
2. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
3. Check “RR ST ANG-MAI” and “RR ST ANG-SUB” item on “DATA MONITOR” of RAS 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 2.
NO >> Replace RAS actuator assembly. Refer to STC-110, "Exploded View".

2. CHECK REAR WHEEL STEERING ANGLE SENSOR (2)

Check the voltage between RAS control unit harness connector and ground.

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	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 RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 3.

3. CHECK REAR WHEEL STEERING ANGLE SENSOR (3)

Check the rear wheel steering angle sensor. Refer to STC-64, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace RAS actuator assembly. Refer to STC-110, "Exploded View".

4. CHECK REAR WHEEL STEERING ANGLE SENSOR GROUND CIRCUIT

1. Disconnect RAS control unit harness connector.
2. Check for continuity between RAS control unit harness connector terminal and rear wheel steering angle sensor harness connector.

RAS control unit		Rear wheel steering angle sensor		Continuity
Connector	Terminal	Connector	Terminal	
B37	4	B53	1, 2, 4	Not existed
	4		3	Existed
	7		1, 3, 4	Not existed
	7		2	Existed
	5		2, 3, 4	Not existed
	5		1	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

With CONSULT-III

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1917”, “C1918” or “RAS warning lamp flickering pattern:24” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 6.

6. CHECK INFORMATION

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "Reference Value".

Is each data standard?

YES >> Check pin terminal and connection of each harness connector for non-standard conditions.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

Component Inspection

INFOID:0000000005549697

1. CHECK REAR WHEEL STEERING ANGLE SENSOR (3)

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

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 RAS actuator assembly. Refer to STC-110, "Exploded View".

Special Repair Requirement

INFOID:0000000005549698

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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

Description

INFOID:0000000005549699

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

DTC Logic

INFOID:0000000005549700

DTC DETECTION LOGIC

DTC	Display items	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.)	• ABS actuator and electric unit (control unit) • CAN communication line • RAS control unit

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1919” or “RAS warning lamp flickering pattern:21” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-65, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005549701

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

With CONSULT-III
Perform “ABS” self-diagnosis.

Is any error system detected?

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

2. PERFORM SELF-DIAGNOSIS

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

Is DTC “U1000” or “U1010” detected?

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

3. PERFORM SELF-DIAGNOSIS

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1919” or “RAS warning lamp flickering pattern:21” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 4.

4. INFORMATION CHECK

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "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 RAS control unit. Refer to STC-109, "Removal and Installation".

Special Repair Requirement

INFOID:0000000005549702

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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

Description

INFOID:0000000005549703

Steering angle sensor signal is transmitted from steering angle sensor to RAS control unit via CAN communication.

DTC Logic

INFOID:0000000005549704

DTC DETECTION LOGIC

DTC	Display items	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 • CAN communication line • RAS control unit

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1920” or “RAS warning lamp flickering pattern:22” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-67, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005549705

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

With CONSULT-III
Perform “ABS” self-diagnosis.

Is any error system detected?

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

2. PERFORM SELF-DIAGNOSIS

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

Is DTC “U1000” or “U1010” detected?

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

3. PERFORM SELF-DIAGNOSIS

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1920” or “RAS warning lamp flickering pattern:22” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 4.

4. INFORMATION CHECK

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "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 RAS control unit. Refer to STC-109, "Removal and Installation".

Special Repair Requirement

INFOID:0000000005549706

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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

Description

INFOID:0000000005549707

The engine speed signal is transmitted to RAS control unit via CAN communication.

DTC Logic

INFOID:0000000005549708

DTC DETECTION LOGIC

DTC	Display items	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.)	• ECM • CAN communication line • RAS control unit

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1921” or “RAS warning lamp flickering pattern: 33” detected?

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

Diagnosis Procedure

INFOID:0000000005549709

1. PERFORM ECM SELF-DIAGNOSIS

With CONSULT-III
Perform “ENGINE” self-diagnosis.

Is any error system detected?

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

2. PERFORM SELF-DIAGNOSIS

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

Is DTC “U1000” or “U1010” detected?

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

3. PERFORM SELF-DIAGNOSIS

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1921” or “RAS warning lamp flickering pattern: 33” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 4.

4. INFORMATION CHECK

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "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 RAS control unit. Refer to STC-109, "Removal and Installation".

Special Repair Requirement

INFOID:0000000005549710

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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

Description

INFOID:0000000005549711

Steering angle sensor signal is transmitted from steering angle sensor to RAS control unit via CAN communication.

DTC Logic

INFOID:0000000005549712

DTC DETECTION LOGIC

DTC	Display items	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 (37 MPH) or more.]	• Steering angle sensor • CAN communication line • RAS control unit

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

With CONSULT-III
1. Drive at 60 km/h (37 MPH) or more for 3 minutes or more.
2. Perform “4WAS(MAIN)/RAS/HICAS” self-diagnosis.

Without CONSULT-III
1. Drive at 60 km/h (37 MPH) or more for 3 minutes or more.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1923” or “RAS warning lamp flickering pattern: 22” detected?

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

Diagnosis Procedure

INFOID:0000000005549713

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

With CONSULT-III
1. Drive at 60 km/h (37 MPH) or more for 3 minutes or more.
2. Perform “ABS” self-diagnosis.

Is any error system detected?

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

2. PERFORM SELF-DIAGNOSIS

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

Is DTC “U1000” or “U1010” detected?

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

3. PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Drive at 60 km/h (37 MPH) or more for 3 minutes or more.
2. Perform “4WAS(MAIN)/RAS/HICAS” self-diagnosis.

Without CONSULT-III
1. Drive at 60 km/h (37 MPH) or more for 3 minutes or more.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1923” or “RAS warning lamp flickering pattern: 22” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

NO >> GO TO 4.

4. INFORMATION CHECK

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "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 RAS control unit. Refer to STC-109, "Removal and Installation".

Special Repair Requirement

INFOID:0000000005549714

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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

Description

INFOID:0000000005549715

Steering angle sensor signal is transmitted from steering angle sensor to RAS control unit via CAN communication.

DTC Logic

INFOID:0000000005549716

DTC DETECTION LOGIC

DTC	Display items	Malfunction detected condition	Possible cause
C1924	STEERING ANGLE SEN [NO NEUT STATE]	Driving continuously at 10 km (6 MPH) or more while the steering angle sensor value is not L10° - R10°.	• Steering angle sensor • CAN communication line • RAS control unit

DTC CONFIRMATION PROCEDURE

1. DTC REPRODUCTION PROCEDURE

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1924” or “RAS warning lamp flickering pattern: 22” detected?

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

Diagnosis Procedure

INFOID:0000000005549717

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 RSU-6, "Inspection".

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

With CONSULT-III
Perform “ABS” self-diagnosis.

Is malfunction detected?

YES >> Check malfunctioning circuit.
NO >> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

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

Is DTC “U1000” or “U1010” detected?

YES >> Check malfunctioning circuit.
NO >> GO TO 4.

4. PERFORM SELF-DIAGNOSIS

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

Without CONSULT-III

1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1924” or “RAS warning lamp flickering pattern: 22” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 5.

5. CHECK INFORMATION

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "Reference Value".

Is each data standard?

YES >> Check pin terminal and connection of each harness connector for non-standard conditions.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

Special Repair Requirement

INFOID:0000000005549718

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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 STEERING ANGLE SENSOR

Description

INFOID:0000000005549719

Steering angle sensor signal is transmitted from steering angle sensor to RAS control unit via CAN communication.

DTC Logic

INFOID:0000000005549720

DTC DETECTION LOGIC

DTC	Display items	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 steering angle sensor signal is improper, the steering angle sensor itself detects the malfunction)	• Steering angle sensor • CAN communication line • RAS control unit

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

With CONSULT-III

1. Start the engine.
   CAUTION:
   Stop 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 “4WAS(MAIN)/RAS/HICAS” self-diagnosis.

Without CONSULT-III

1. Start the engine.
   CAUTION:
   Stop 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 the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1926” or “RAS warning lamp flickering pattern: 22” detected?

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

Diagnosis Procedure

INFOID:0000000005549721

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

With CONSULT-III

Perform “ABS” self-diagnosis.

Is any error system detected?

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

2.PERFORM SELF-DIAGNOSIS

With CONSULT-III

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

Is DTC “U1000” or “U1010” detected?

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

3.PERFORM SELF-DIAGNOSIS

With CONSULT-III

1. Start the engine.
   CAUTION:
   Stop 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 “4WAS(MAIN)/RAS/HICAS” self-diagnosis.

Without CONSULT-III

1. Start the engine.
   CAUTION:
   Stop 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 the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1926” or “RAS warning lamp flickering pattern: 22” detected?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> GO TO 4.

4. INFORMATION CHECK

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "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 RAS control unit. Refer to STC-109, "Removal and Installation".

Special Repair Requirement

INFOID:0000000005549722

BEFORE REPLACING RAS CONTROL UNIT

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

C1929 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Description

INFOID:0000000005549723

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

DTC Logic

INFOID:0000000005549724

DTC DETECTION LOGIC

DTC	Display items	Malfunction detected condition	Possible cause
C1929	VDC	Malfunction is detected in VDC malfunction signal that is output from ABS actuator and electric unit (control unit) via CAN communication. (VDC malfunction signal is improper.)	• ABS actuator and electric unit (control unit) • CAN communication • RAS control unit

DTC CONFIRMATION PROCEDURE

NOTE:
Every time when “C1929” is detected, either the ABS actuator ad electric unit (control unit) or the RAS control unit simultaneously detects a DTC that leads to a direct cause of the malfunction.

1. DTC REPRODUCTION PROCEDURE

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

Without CONSULT-III
1. Start the engine.
2. Perform the self-diagnosis. Refer to STC-38, "Diagnosis Description".

Is DTC “C1929” or “RAS warning lamp flickering pattern:26” detected?

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

Diagnosis Procedure

INFOID:0000000005549725

1. PERFORM SELF-DIAGNOSIS

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

Is DTC “U1000” or “U1010” detected?

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

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

With CONSULT-III
Perform “ABS” self-diagnosis.

Is DTC except “DTC related to a malfunction of RAS control unit” detected?

YES >> Check the DTC. Refer to BRC-119, "DTC Index".
NO >> GO TO 3.

3. PERFORM RAS CONTROL UNIT SELF-DIAGNOSIS

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

Is DTC except “C1929” detected?

YES >> Check the DTC. Refer to STC-102, "DTC Index".
NO >> GO TO 4.

4. INFORMATION CHECK

With CONSULT-III

1. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
2. Check the “DATA MONITOR” value of each DTC detected with the self-diagnosis function. Refer to STC-89, "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 RAS control unit. Refer to STC-109, "Removal and Installation".

Special Repair Requirement

INFOID:0000000005549726

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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:0000000005549727

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:0000000005549728

DTC DETECTION LOGIC

DTC	Display items	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	When RAS control unit is not transmitting or receiving CAN communication signal for 2 seconds or more.	• CAN communication line • RAS control unit

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

With CONSULT-III

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

Is DTC “U1000” detected?

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

Diagnosis Procedure

INFOID:0000000005549729

1.PERFORM SELF-DIAGNOSIS

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

Is DTC “U1000” detected?

YES >> Perform CAN diagnosis. Refer to LAN-29, "CAN System Specification Chart".
NO >> INSPECTION END

Special Repair Requirement

INFOID:0000000005549730

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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 CONTROL UNIT (CAN)

Description

INFOID:0000000005549731

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:0000000005549732

DTC DETECTION LOGIC

DTC	Display items	Malfunction detected condition	Possible cause
U1010	CONTROL UNIT (CAN)	Detecting error during the initial diagnosis of CAN controller of RAS control unit.	Malfunction of RAS control unit

DTC CONFIRMATION PROCEDURE

1.DTC REPRODUCTION PROCEDURE

With CONSULT-III

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

Is DTC “U1010” detected?

YES >> Proceed to diagnosis procedure. Refer to STC-80, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005549733

1.RAS CONTROL UNIT

Check that there is no malfunction in RAS control unit harness connector or disconnection.

Is the inspection result normal?

YES >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".
NO >> Repair or replace damaged parts.

Special Repair Requirement

INFOID:0000000005549734

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

- **Never erase the memory (history) of self-diagnosis results when replacing RAS 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:0000000005549735

Supplies power to RAS control unit.

Diagnosis Procedure

INFOID:0000000005549736

1.CHECK RAS CONTROL UNIT POWER SUPPLY

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

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	27	Ground	0 V

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

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	27	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check the following items. Repair or replace the malfunctioning parts.
- 10A fuse (#45) open
- Short among 10A fuse (#45) connector, RAS control unit harness connector No. 27 terminal and the ground
- Open between the ignition switch and RAS control unit harness connector No. 27 terminal
- Ignition switch

2.CHECK RAS MOTOR POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Remove RAS motor relay.
3. Check the continuity between RAS motor relay harness connector and ground.

RAS motor relay		—	Continuity
Connector	Terminal		
B36	2	Ground	Existed
	1		Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the harnesses and connectors.

3.CHECK RAS MOTOR POWER SUPPLY CIRCUIT (2)

Check the voltage between RAS motor relay harness connector and ground.

RAS motor relay		—	Voltage (Approx.)
Connector	Terminal		
B36	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Check the following items. Repair or replace the malfunctioning parts.
- 20A fuse (#37) open
- Short among 20A fuse (#37) connector, RAS motor relay harness connector No. 3 terminal and the ground
- Open between the battery and RAS motor relay harness connector No. 3 terminal

4. CHECK RAS MOTOR POWER SUPPLY CIRCUIT (3)

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

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	25	Ground	Battery voltage

5. Turn the ignition switch OFF.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

5. CHECK RAS MOTOR RELAY

Check the RAS motor relay. Refer to STC-54, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Replace RAS motor relay.

6. CHECK RAS MOTOR POWER SUPPLY

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

RAS control unit		—	Voltage (Approx.)
Connector	Terminal		
B37	37	Ground	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

POWER STEERING SOLENOID VALVE

Description

INFOID:0000000005549739

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

Diagnosis Procedure

INFOID:0000000005549740

1.CHECK POWER STEERING SOLENOID VALVE SIGNAL

With CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
3. Check “POWER STR SOL” item on “DATA MONITOR” of RAS 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 RAS control unit harness connector and ground.

RAS control unit				Data (Approx.)
Connector	Terminal	—	Condition	
B37	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 RAS control unit harness connector or disconnection.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

2.CHECK POWER STEERING SOLENOID VALVE CIRCUIT

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

RAS control unit		Power steering solenoid valve		Continuity
Connector	Terminal	Connector	Terminal	
B37	36	F45	1	Existed

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

Power steering solenoid valve		—	Continuity
Connector	Terminal		
F45	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 power steering solenoid valve. Refer to STC-84, "Component Inspection".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair the steering gear. Refer to ST-26, "Exploded View".

Component Inspection

INFOID:0000000005549741

1. POWER STEERING SOLENOID VALVE INSPECTION

1. Turn the ignition switch OFF.
2. Disconnect the 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 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 the steering gear. Refer to ST-26, "Exploded View".

RAS WARNING LAMP

Description

INFOID:0000000005549742

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

Component Function Check

INFOID:0000000005549743

1.CHECK RAS WARNING LAMP FUNCTION

1. Turn ignition switch ON.
2. Make sure that RAS warning lamp lights up.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to diagnosis procedure. Refer to STC-85, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005549744

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

With CONSULT-III

Perform “METER/M&A” self-diagnosis.

Is any error system detected?

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

2.PERFORM SELF-DIAGNOSIS

With CONSULT-III

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

Is DTC “U1000” or “U1010” detected?

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

3.PERFORM COMBINATION METER CIRCUIT

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

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

Is the inspection result normal?

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

4.CHECK RAS WARNING LAMP SIGNAL

With CONSULT-III

1. Connect the unified meter and A/C amp. harness connector.
2. Connect the combination meter harness connector.
3. Turn the ignition switch ON.

CAUTION:
Never start the engine.

4. Select “DATA MONITOR” of “4WAS(MAIN)/RAS/HICAS”.
5. Check “WARNING LAMP” item on DATA MONITOR of RAS control unit.

Does the item on “DATA MONITOR” indicate “On”?

YES >> GO TO 5.
NO >> Replace RAS control unit. Refer to STC-109, "Removal and Installation".

5. CHECK COMBINATION METER

Perform the trouble diagnosis of the combination meter. Refer to MWI-58, "COMBINATION METER : Diagnosis Procedure".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the combination meter. Refer to MWI-146, "Exploded View".

Special Repair Requirement

INFOID:0000000005549745

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

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

STOP LAMP SWITCH

Description

INFOID:0000000005549746

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the RAS control unit.

Component Function Check

INFOID:0000000005549747

1.CHECK STOP LAMP SWITCH OPERATION

Operate the brake pedal. Then check that the stop lamp in the rear combination lamp turns ON/OFF correctly.

Condition	Stop lamp illumination status
When the brake pedal is operation	ON
When the brake pedal is not operation.	OFF

Is the inspection result normal?

YES >> INSPECTION END
NO >> Proceed to diagnosis procedure. Refer to STC-87, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005549748

1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect RAS control unit harness connector.
3. Disconnect stop lamp switch harness connector.
4. Check terminal for deformation, disconnection, looseness, etc.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace or repair damaged parts.

2.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to STC-87, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace stop lamp switch.

3.CHECK STOP LAMP SWITCH CIRCUIT

1. Turn the ignition switch OFF.
2. Check the voltage between RAS control unit harness connector and ground.

RAS control unit		—	Condition	Voltage
Connector	Terminal			
B37	22	Ground	Brake pedal is depressed	Battery voltage
			Brake pedal is released	Approx. 0 V

Is the inspection result normal?

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

Component Inspection

INFOID:0000000005549749

1.CHECK STOP LAMP SWITCH

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

Stop lamp switch Terminal	Condition	Continuity
1 – 2	Release stop lamp switch (When brake pedal is depressed.)	Existed
	Push stop lamp switch (When brake pedal is released.)	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace stop lamp switch. Refer to BR-18, "Exploded View".

Special Repair Requirement

INFOID:0000000005549750

BEFORE REPLACING RAS CONTROL UNIT

- Record the self-diagnosis results (history).

CAUTION:

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

ECU DIAGNOSIS INFORMATION

RAS CONTROL UNIT

Reference Value

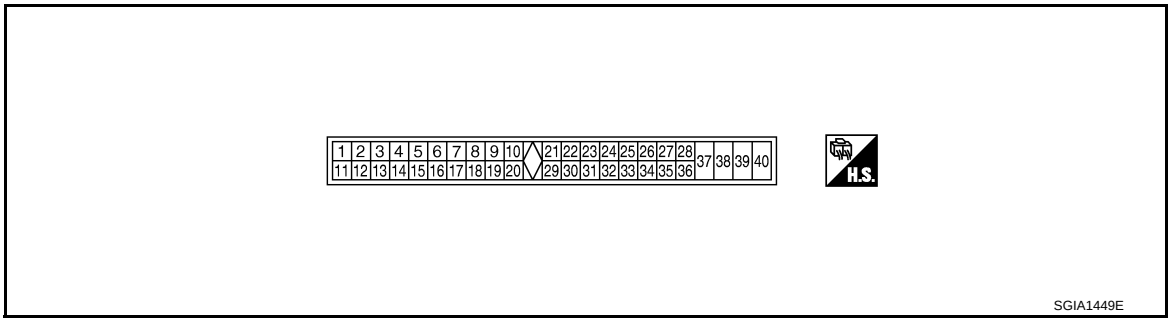
INFOID:0000000005235456

VALUES ON THE DIAGNOSIS TOOL

Monitor item	Content	Condition	Value/Status
VHCL SPEED SE	Wheel speed	Vehicle stopped	0 km/h (0 MPH)
		Start the engine. Wait a minute. Drive the vehicle. **CAUTION:** **Check air pressure of tire under standard condition.**	Approximately equal to the indication on speedometer (Inside of ±10%)
STEERING ANG	Steering angle detected by steering angle sensor	Steering wheel turned right	0° – R756°
		Straight-ahead	Approx. 0°
		Steering wheel turned left	0° – L756°
ENGINE SPEED	Engine speed	Engine stopped	0 rpm
		Engine running (Engine speed: 400 rpm or more)	Approximately equal to the indication on tachometer
POWER STR SOL	Monitored value of current at power steering solenoid valve	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	Rear wheel steering angle (main) sensor output voltage	RAS actuator assembly turns right completely	Approx. 4.4 V
		RAS actuator assembly is neutral	Approx. 2.4 V
		RAS actuator assembly turns left completely	Approx. 0.4 V
RR ST ANG-SUB	Rear wheel steering angle (sub) sensor output voltage	RAS actuator assembly turns right completely	Approx. 4.4 V
		RAS actuator assembly is neutral	Approx. 2.4 V
		RAS actuator assembly turns left completely	Approx. 0.4 V
RR ST ANG-VOL	Rear wheel steering angle sensor input voltage	Ignition switch: ON	Approx. 5 V
		Ignition switch: OFF	0 V
C/U VOLTAGE	Power supply voltage for RAS control unit	Ignition switch: ON	Battery voltage
		Ignition switch: OFF	—
MOTOR VOLTAGE	Monitored value of voltage at RAS motor	Ignition switch: ON	Battery voltage
		Ignition switch: OFF	0 V
MOTOR CURRENT	Monitored value of current at RAS motor	RAS motor running	Approx. 0 – 20 A
MTR CRNT OPE	Current commanded value to RAS motor	RAS motor running	Approx. –20 – 20 A
RR ANGLE OPE	Rear wheel steering angle detected by rear wheel steering angle sensor	RAS actuator assembly turned right	Approx. 0 –1°
		RAS actuator assembly is neutral	Approx. 0°
		RAS actuator assembly turned left	Approx. 0 – –1°
STOP LAMP SW	Stop lamp condition	Brake pedal: Depressed	ON
		Brake pedal: Released	OFF
HICAS RELAY	RAS motor relay condition	Ignition switch: ON	ON
		Ignition switch: OFF	OFF

Monitor item	Content	Condition	Value/Status
FAIL SAFE	Fail-safe condition	Fail-safe condition	ON
		Normal	OFF
WARNING LAMP	RAS warning lamp condition	RAS warning lamp: ON	ON
		RAS warning lamp: OFF	OFF

TERMINAL LAYOUT



PHYSICAL VALUES

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

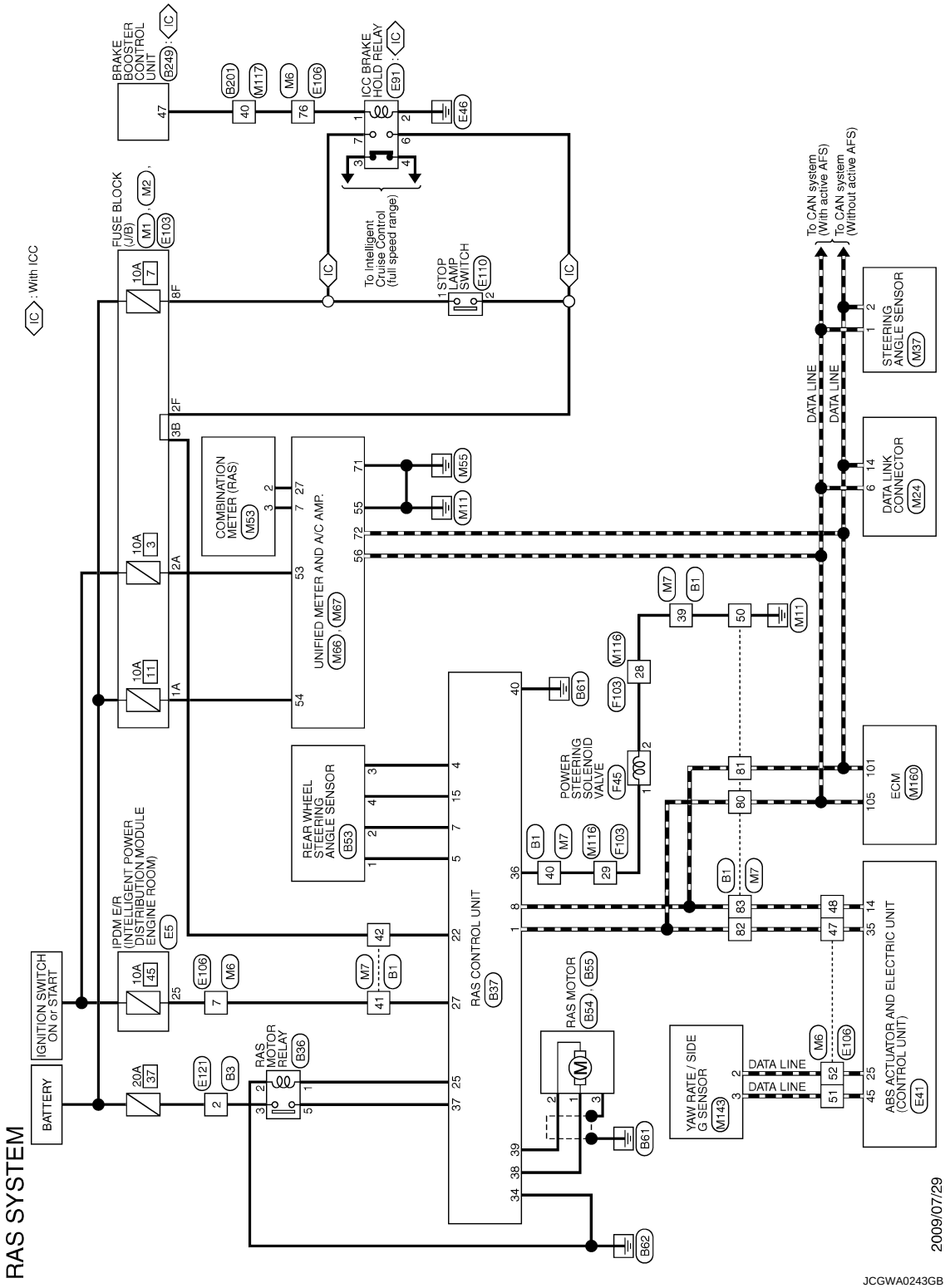
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
36 (LG)	Ground	Power steering solenoid valve	Output	Vehicle speed: 0 km/h (0 MPH) (Engine is running)	4.4 – 6.6 V
				Vehicle speed: 100 km/h (62 MPH)	2.4 – 3.6 V
37 (P)	Ground	RAS motor power supply	Input	Ignition switch: ON	Battery voltage
				Ignition switch: OFF	0 V
38 (G/Y)	Ground	RAS motor output voltage (right)	Output	While RAS motor activates rightward	Battery voltage
				While RAS motor activates leftward	0 V
39 (G/R)	Ground	RAS motor output voltage (left)	Output	While RAS motor activates rightward	0 V
				While RAS motor activates leftward	Battery voltage
40 (B)	Ground	Ground (RAS motor)	—	Always	0 V

CAUTION:

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

Wiring Diagram - RAS SYSTEM -

INFOID:0000000005612695



RAS SYSTEM

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	L	–
3	W	–
5	G	–
6	G	–
7	P	–
8	O	–
9	W	–
10	SB	–
11	SB	–
12	B	–
13	G	–
14	R	–
15	W	–
16	SHIELD	–
17	L	–
18	P	–
19	G	–
20	Y	–
21	W	–
23	V	–
24	P	–
25	BR	–
26	GR	–
27	O	–
28	W	–
29	SHIELD	–
38	B	–
39	B	–
40	LG	–
41	G	–
42	GR	–
43	SB	–
44	V	–
45	GR	–
50	B	–
51	V	–
52	SB	–
53	SHIELD	–
54	BR	–
55	Y	–
56	SHIELD	–
57	P	–
58	L	–
59	SHIELD	–
60	L	–
61	P	–
62	GR	–
63	G	–
64	O	–
65	W	–
66	V	–
67	LG	–
68	Y	–
69	G	–
70	GR	–
71	G	–
72	B	–
73	W	–
74	V	–
75	O	–
76	LG	–
77	L	–
78	GR	–
79	W	–
80	L	–
81	P	–
82	L	–
83	P	–
84	SB	–
85	R	–
86	Y	–
87	B	–
88	G	–
89	BR	–
90	W	–
91	R	–
92	O	–
93	BR	–
94	V	–
95	Y	–
96	O	–
97	W	–
98	GR	–
99	W	–

Connector No.	B3
Connector Name	WIRE TO WIRE
Connector Type	M02FW-LC

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	R	– [With VK engine]
1	L	– [With VQ engine]
2	R	–

Connector No.	B36
Connector Name	RAS MOTOR RELAY
Connector Type	MS02FL-M2-LC

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	SB	–
2	GR	–
3	R	–
5	P	–

Connector No.	B37
Connector Name	RAS CONTROL UNIT
Connector Type	A36FW-M4

H.S.

Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
4	Y	R-ANG SEN MAIN SIG
5	W	R-ANG SEN VCC
7	R	R-ANG SEN SUB SIG
8	P	CAN-L
15	G	R-ANG SEN GND
22	GR	STOP LAMP SW
25	SB	R-MTR RLY
27	G	IGN
34	GR	GND
36	LG	EPS SOL+
37	P	R-MTR PWR SUPPLY
38	G/Y	R-MTR (RH)
39	G/R	R-MTR (LH)
40	B	R-MTR GND

Connector No.	B53
Connector Name	REAR WHEEL STEERING ANGLE SENSOR
Connector Type	RS04FGY-PR

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	–
2	R	–
3	Y	–
4	G	–

JCGWA0244GB

RAS SYSTEM

Connector No.	B54
Connector Name	RAS MOTOR
Connector Type	X02FB

Terminal No.	Color of Wire	Signal Name [Specification]
1	G/Y	–
2	G/R	–

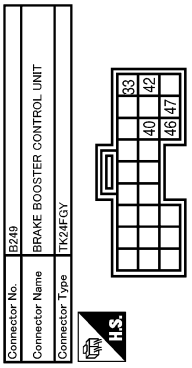
Connector No.	B55
Connector Name	RAS MOTOR
Connector Type	P01FB-A

Terminal No.	Color of Wire	Signal Name [Specification]
3	SHIELD	–

Connector No.	B201
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	R	–
3	BR	–
4	SB	–
6	O	–
7	GR	–
8	W	–
10	G	–
11	BR	–
12	Y	–
13	SHIELD	–
14	G	–
15	R	–
16	SHIELD	–
17	LG	–
18	GR	–
19	V	–
20	SB	–
21	LG	–
22	B	– [With entertainment system]
22	GR	– [Without entertainment system]
23	W	– [With entertainment system]
23	LG	– [Without entertainment system]
24	R	– [With entertainment system]
24	W	– [Without entertainment system]
25	SHIELD	– [With entertainment system]
25	V	– [Without entertainment system]
26	SB	–
27	V	–
28	SHIELD	–
29	O	–
30	P	–
31	W	–
32	GR	–
33	SB	– [With ICC]
40	LG	– [Without ICC]
40	V	– [Without ICC]
41	SB	– [With ICC]
41	Y	– [Without ICC]
42	V	– [With ICC]
42	W	– [Without ICC]
43	BR	– [With ICC]
43	B	– [Without ICC]
44	R	–
45	G	–
46	O	– [With ICC]
46	SHIELD	– [Without ICC]
47	L	– [With ICC]
47	B	– [Without ICC]
48	P	– [With ICC]
48	R	– [Without ICC]
49	G	– [With ICC]
49	W	– [Without ICC]
50	SHIELD	–
51	W	–
52	R	–
53	G	–
54	L	–
55	SB	–
60	GR	–
61	LG	–
62	SB	–
63	P	–
64	BR	–
65	O	–
66	Y	–
67	W	–
68	SHIELD	–
69	G	–
71	SB	–
72	V	–
73	LG	–
74	W	–
75	BR	–
76	V	–
77	LG	–
80	O	–
81	G	–
82	P	–
83	Y	–
84	R	–
85	SB	–
86	GR	–
87	L	–
91	V	–
92	W	–
93	R	–
94	LG	–
95	GR	–
96	W	–
97	G	–
98	O	–
99	L	–
100	Y	–

Connector No.	B249
Connector Name	BRAKE BOOSTER CONTROL UNIT
Connector Type	TK24FGY



Terminal No.	Color of Wire	Signal Name [Specification]
33	G	IGNITION
40	SB	IBA OFF SW
42	G	IGNITION
46	B	GND
47	LG	BRAKE HOLD RLY DRIVE SIGNAL

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

Terminal No.	Color of Wire	Signal Name [Specification]
4	V	–
5	L	–
7	R	–
10	SB	–
11	BR	–
12	B	–
13	Y	–
16	LG	–
19	W	–
25	G	–
26	R	–
27	Y	–
28	O	–
30	GR	–
32	SB	–
33	P	–
36	G	–

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RAS SYSTEM

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	B	GND
2	G	UBMR
3	R	UBVR
4	B	GND
5	Y	DS FL
6	O	DP RL
7	BR	DP RR
9	B	DP FR
10	W	DS FR
12	L	VAC
14	P	CAN-L
15	SHIELD	AGND
19	P	UST
25	Y	BUS-L
26	R	DP FL
27	GR	DS RL
28	G	UZ
29	LG	DS RR
30	SB	BLS
31	R	VDC OFF SW
35	L	CAN-H
45	B	BUS-H

Connector No.	E91
Connector Name	ICC BRAKE HOLD RELAY
Connector Type	M06FGY-R-US

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	L	–
2	B	–
3	G	–
4	G	–
6	W	–
7	L	–

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

H.S.

7F 6F 5F 4F 3F 2F 1F
16F 15F 14F 13F 12F 11F 10F 9F 8F

Terminal No.	Color of Wire	Signal Name [Specification]
1F	SB	–
2F	W	–
3F	Y	–
4F	G	–
6F	O	–
8F	L	–
9F	R	–
10F	L	–

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	O	–
3	SB	–
4	LG	–
5	Y	–
6	W	–

7	G	–
8	V	–
9	R	–
10	BR	–
11	B	–
12	G	–
13	R	–
14	W	–
15	SHIELD	–
16	SB	–
17	L	–
18	P	–
19	G	–
20	W	– [With ICC]
20	Y	– [Without ICC]
21	BR	–
22	R	– [With ICC]
22	V	– [Without ICC]
23	G	–
24	L	– [With ICC]
24	P	– [Without ICC]
25	Y	– [With ICC]
25	L	– [Without ICC]
26	SHIELD	–
28	G	–
29	LG	–
30	O	–
31	BR	–
32	W	–
33	Y	–
34	O	–
35	SB	–
36	P	–
37	Y	–
38	GR	–
39	LG	–
41	LG	–
42	V	–
43	R	–
44	G	–
45	GR	–
46	W	–
47	L	–
48	P	–
49	SB	–
50	BR	–
51	B	–
52	Y	–
53	O	–
54	R	–
55	SB	–
56	P	–

59	P	–
60	SB	–
61	V	–
62	P	–
63	LG	–
64	L	–
65	O	–
66	L	–
69	L	–
70	SHIELD	–
71	G	–
72	G	–
73	R	–
74	BR	–
76	L	–
77	W	–
78	Y	–
80	SB	–
81	L	–
82	W	–
83	LG	–
84	GR	–
85	G	–
86	P	–
87	W	–
88	O	–
89	LG	–
90	BR	–
91	GR	–
92	BR	–
93	SB	–
94	W	–
95	Y	–
96	W	–
100	Y	–

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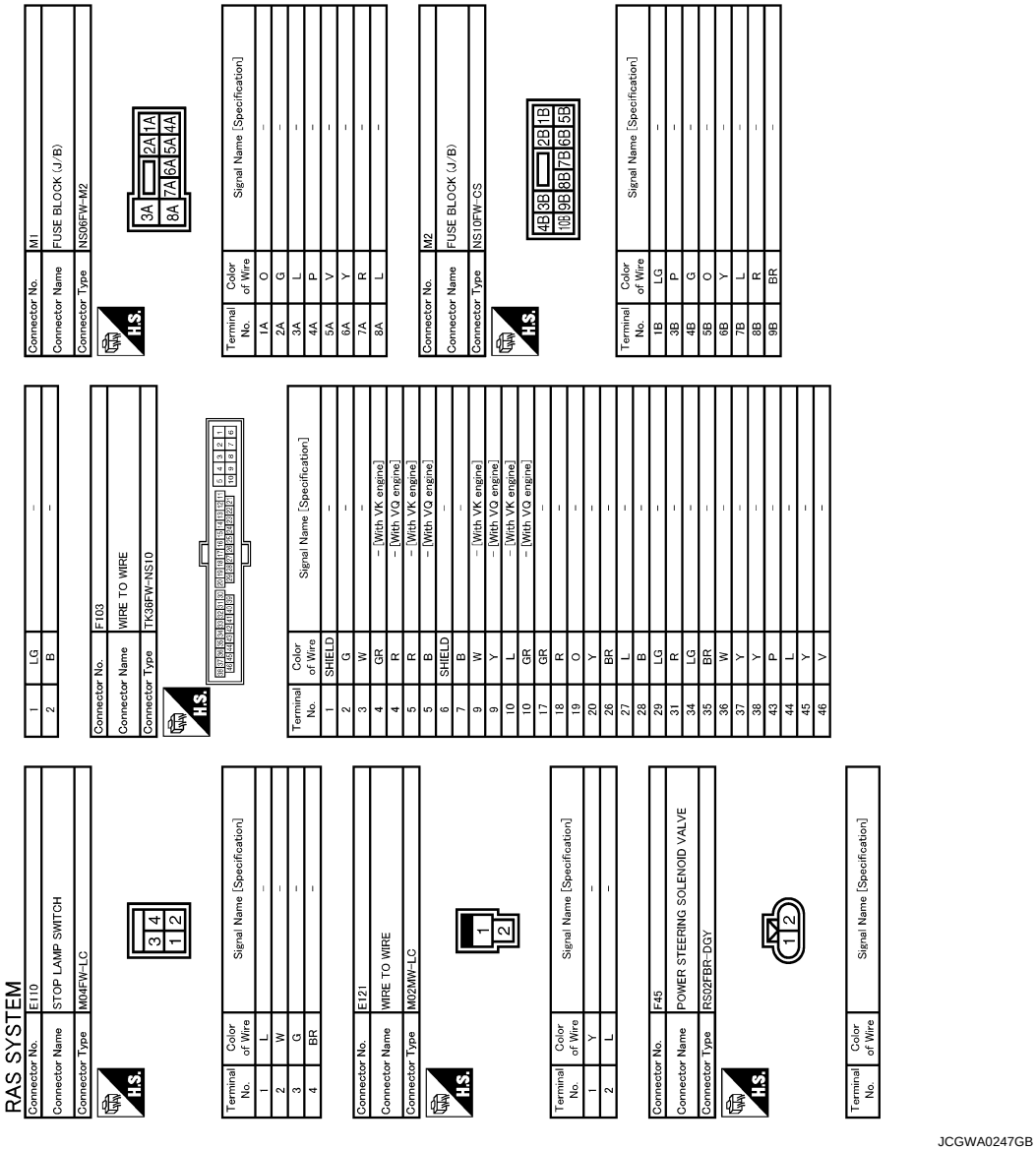

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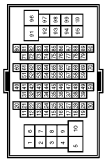
RAS SYSTEM

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



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	O	–
3	SB	–
4	LG	–
5	GR	–
6	W	–
7	G	–
8	W	–
9	P	–
10	BR	–
11	B	–
12	G	–
13	R	–
14	W	–
15	SHIELD	–
16	BR	–
17	L	–
18	P	–
19	G	–
20	W	– [With ICC]
20	GR	– [Without ICC]
21	BR	– [With ICC]
21	R	– [Without ICC]
22	R	– [With ICC]
22	L	– [Without ICC]
23	G	–
24	L	– [With ICC]
24	P	– [Without ICC]
25	Y	– [With ICC]
25	W	– [Without ICC]
26	SHIELD	–
28	GR	–
29	V	–
30	O	–
31	BR	–
32	W	–
33	Y	–
34	L	–
35	L	–
36	P	–
37	G	–
38	R	–
39	G	–
41	L	–
42	W	–
43	R	–
44	LG	–
45	GR	–
46	W	–
47	L	–
48	P	–
49	O	–
50	LG	–
51	SB	–
52	Y	–
53	O	–
54	BR	–
55	SB	–
56	P	–
59	SB	–
60	SB	–
61	V	–
62	P	–
63	R	–
64	L	–
65	O	–
66	L	–
69	V	–
70	SHIELD	–
71	O	–
72	GR	–
73	W	–
74	SB	–
76	V	–
77	V	–
78	Y	–
80	O	–
81	L	–
82	W	–
83	Y	–
84	L	–
85	P	–
86	BR	–
87	P	–
88	V	–
89	G	–
90	P	–
91	R	–
92	R	–
93	GR	–
94	L	–
95	G	–
96	W	–
100	Y	–

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RAS SYSTEM

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	B	–
3	W	–
5	G	–
6	P	–
7	V	–
8	O	–
9	W	–
10	W	–
11	O	–
12	B	–
13	G	–
14	R	–
15	W	–
16	SHIELD	–
17	L	–
18	P	–
19	G	–
20	R	–
21	LG	–
23	V	–
24	P	–
25	BR	–
26	GR	–
27	O	–
28	W	–
29	SHIELD	–
38	B	–
39	B	–
40	LG	–
41	G	–
42	Y	–
43	SB	–
44	W	–
45	B	–
50	B	–
51	V	–
52	LG	–
53	SHIELD	–
54	BR	–
55	Y	–
56	SHIELD	–
57	P	–
58	L	–
59	SHIELD	–
60	L	–
61	BR	–
62	R	–
63	Y	–
64	L	–
65	W	–
66	V	–
67	LG	–
68	Y	–
69	G	–
70	V	–
71	W	–
72	B	–
73	W	–
74	LG	–
75	P	–
76	LG	–
77	SB	–
78	GR	–
79	R	–
80	L	–
81	P	–
82	L	–
83	P	–
84	SB	–
85	W	–
86	Y	–
87	B	–
88	G	–
89	O	–
90	W	–
91	R	–
92	O	–
93	BR	–
94	V	–
95	O	–
96	W	–
97	R	–
98	R	–
99	G	– [With VK engine]
99	O	– [With VQ engine]

Connector No.	M24
Connector Name	DATA LINK CONNECTOR
Connector Type	BD16FW

H.S.

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

Connector No.	M37
Connector Name	STEERING ANGLE SENSOR
Connector Type	TH08FW-NH

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	L	CAN-H
2	P	CAN-L
7	B	GND
8	GR	IGN

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

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	O	BATTERY POWER SUPPLY
2	LG	COMMUNICATION SIGNAL (METER->AMP.)
3	GR	COMMUNICATION SIGNAL (AMP.->METER)
5	B	GROUND
6	W	ALTERNATOR SIGNAL
7	P	AIR BAG SIGNAL
10	G	SECURITY INDICATOR SIGNAL
15	B	GROUND
16	B	METER CONTROL SWITCH GROUND
21	R	IGNITION POWER SUPPLY
22	B	GROUND
24	BR	COMMUNICATION SIGNAL (LCD->AMP.)
25	Y	COMMUNICATION SIGNAL (AMP.->LCD)
26	R	VEHICLE SPEED SIGNAL (8-PULSE)
27	V	PARKING BRAKE SWITCH SIGNAL
28	W	BRAKE FLUID LEVEL SWITCH SIGNAL
29	SB	SEAT BELT BUCKLE SW (DRIVER SIDE)
30	G	PASSENGER SEAT BELT WARNING SIGNAL
31	L	WASHER LEVEL SWITCH SIGNAL
34	O	ILL CON OUT
36	LG	SELECT SWITCH SIGNAL
37	SB	ENTER SWITCH SIGNAL
38	L	TRIP A/B RESET SWITCH SIGNAL
39	P	ILLUMINATION CONTROL SWITCH SIGNAL (-)
40	O	ILLUMINATION CONTROL SWITCH SIGNAL (+)

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RAS SYSTEM

Connector No.	M66
Connector Name	UNIFIED METER AND A/C AMP.
Connector Type	TH40FW-NH

H.S.

1	2	3	4	5	6	7	8	9	10	11		14	15	16			20
21	22	23		25	26	27	28		30			34		36		38	40

Terminal No.	Color of Wire	Signal Name [Specification]
4	P	STOP LAMP SWITCH SIGNAL
5	L	MANUAL MODE SHIFT UP SIGNAL
6	O	PADDLE SHIFTER UP SIGNAL
7	GR	COMMUNICATION SIGNAL (AMP.->METER)
8	L	VEHICLE SPEED SIGNAL (2-PULSE)
9	SB	FRONT SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE)
10	W	MANUAL MODE SIGNAL
11	G	NON-MANUAL MODE SIGNAL
14	BR	COMMUNICATION SIGNAL (LCD->AMP.)
20	L	ION SENSOR SIGNAL
23	Y	AT SNOW SWITCH SIGNAL
25	V	MANUAL MODE SHIFT DOWN SIGNAL
26	G	PADDLE SHIFTER DOWN SIGNAL
27	LG	COMMUNICATION SIGNAL (METER->AMP.)
28	R	VEHICLE SPEED SIGNAL (8-PULSE)
30	V	PARKING BRAKE SWITCH SIGNAL
34	Y	COMMUNICATION SIGNAL (AMP.->LCD)
38	L	BLOWER MOTOR CONTROL SIGNAL

Connector No.	M67
Connector Name	UNIFIED METER AND A/C AMP.
Connector Type	TH32FW-NH

H.S.

41	42	43	44	45	46	47					53	54	55	56
57	58	59	60	61	62	63		65			69	70	71	72

Terminal No.	Color of Wire	Signal Name [Specification]
41	V	ACC POWER SUPPLY
42	Y	FUEL LEVEL SENSOR SIGNAL
43	R	INTAKE SENSOR SIGNAL
44	LG	IN-VEHICLE SENSOR SIGNAL
45	P	AMBIENT SENSOR SIGNAL
46	O	SUNLOAD SENSOR SIGNAL
47	V	GAS SENSOR SIGNAL
53	G	IGNITION POWER SUPPLY
54	O	BATTERY POWER SUPPLY
55	B	GROUND
56	L	CAN-H
57	W	BRAKE FLUID LEVEL SWITCH SIGNAL
58	B	FUEL LEVEL SENSOR GROUND
59	GR	INTAKE SENSOR GROUND
60	L	IN-VEHICLE SENSOR GROUND
61	BR	AMBIENT SENSOR GROUND
62	SB	SUNLOAD SENSOR GROUND
63	R	ION MODE SIGNAL
65	O	ECV SIGNAL
69	L	A/C LAN SIGNAL
70	R	EACH DOOR MOTOR POWER SUPPLY
71	B	GROUND
72	P	CAN-L

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

H.S.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36

Terminal No.	Color of Wire	Signal Name [Specification]
1	B	–
2	W	–
3	L	–
4	B	– [With VK engine]
4	R	– [With VQ engine]
5	R	– [With VK engine]
5	B	– [With VQ engine]
6	B	–
7	B	–
9	L	– [With VK engine]
9	R	– [With VQ engine]
10	R	–
17	LG	–
18	R	–
19	O	–
20	Y	–
26	V	–

27	L	–
28	B	–
29	LG	–
31	W	–
34	LG	–
35	BR	–
36	W	–
37	Y	–
38	O	–
43	P	–
44	L	–
45	G	–
46	Y	–

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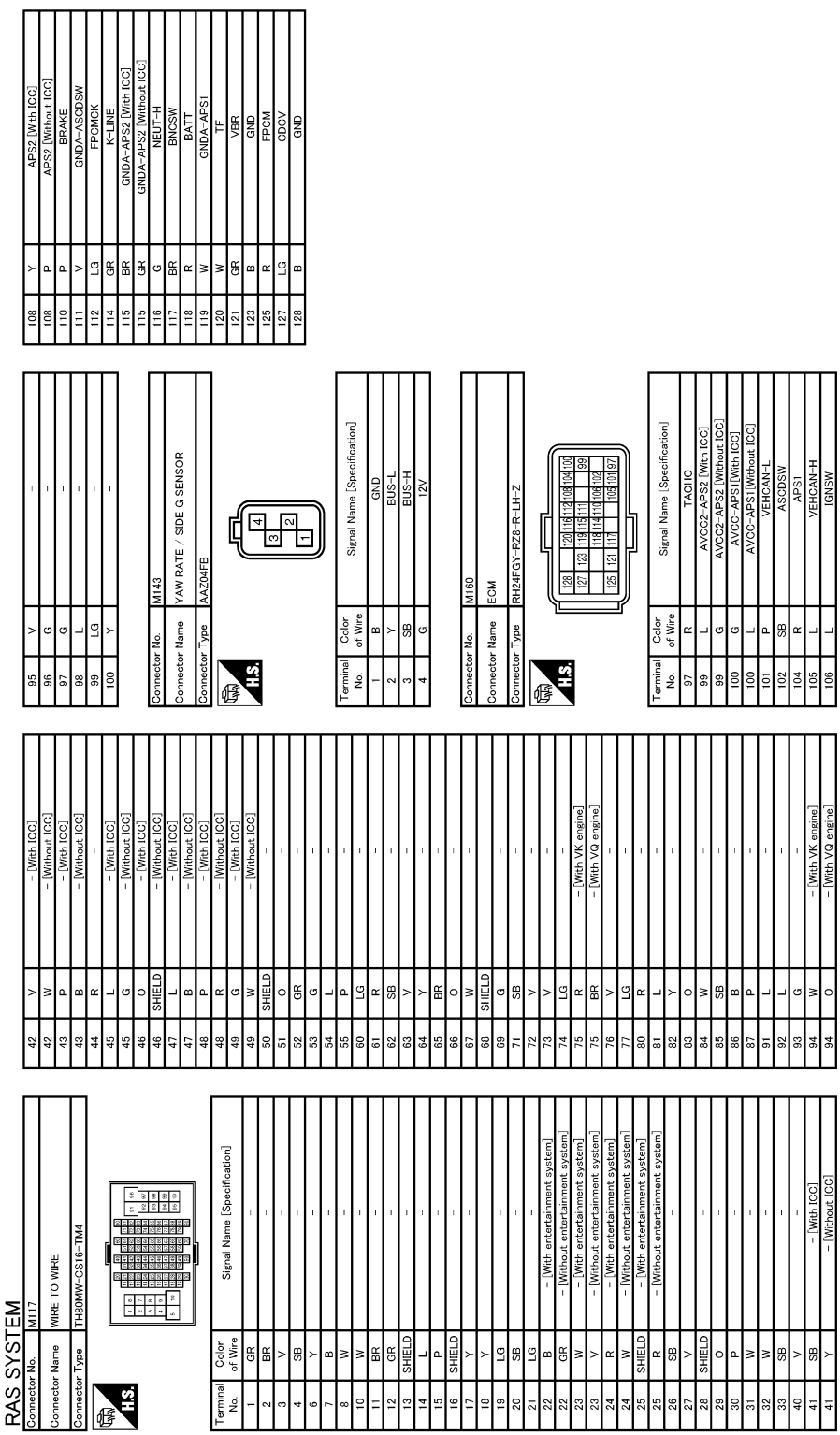

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Fail-Safe

INFOID:0000000005235458

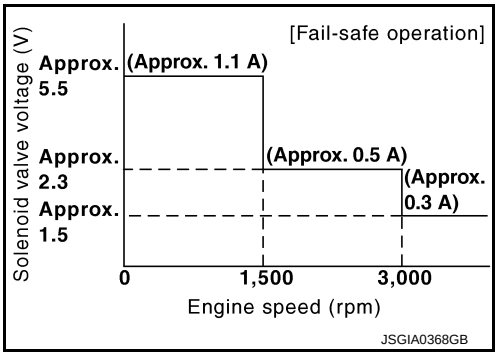
RAS system

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

Mode	Warning lamp	DTC	Detected area (Error area)	Error area and root cause
Fail-safe	Turn-ON	C1900 C1901 C1905 C1906 C1907 C1908 C1922 C1925 C1927 C1928 C1933	RAS control unit	RAS control unit error
	Turn-ON	C1902 C1903 C1904 C1910 C1913	RAS motor	RAS motor error
	Turn-ON	C1909	RAS control unit	RAS control unit
	Turn-ON	C1911 C1912	RAS motor	RAS motor power supply error
	Turn-ON	C1914	Rear wheel steering sensor	Rear wheel steering sensor power supply error
	Turn-ON	C1915 C1916	Rear wheel steering sensor	Rear wheel steering sensor output voltage error
	Turn-OFF	C1917	Rear wheel steering sensor	Rear wheel steering sensor (main and sub) output signal value error signal
	Turn-ON	C1918	Rear wheel steering sensor	Rear wheel steering sensor (main and sub) output signal error
	Turn-ON	C1919	ABS actuator and electric unit (control unit)	Vehicle speed signal error
	Turn-ON	C1920 C1923 C1924	Steering angle sensor	Steering angle sensor input signal error
	Turn-ON	C1921	ECM	Engine speed signal error
	Turn-ON	C1926	Steering angle sensor	Steering angle sensor error
	Turn-ON	C1929	ABS actuator and electric unit (control unit)	ABS actuator and electric unit (control unit) error
	Turn-ON	U1000	CAN communication line	CAN communication error
	Turn-ON	U1010	RAS control unit	RAS control unit

EPS system

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



Mode	Warning lamp	DTC	Detected area (Error area)	Error part and root cause
Fail-safe	Turn-ON	C1919	ABS actuator and electronic unit (control unit)	Vehicle speed signal error

DTC Inspection Priority Chart

INFOID:0000000005235459

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 CIRCUIT • U1010 CONTROL UNIT (CAN)
2	• C1900 CONTROL UNIT [ABNORMAL1] • C1901 CONTROL UNIT [ABNORMAL2] • C1905 CONTROL UNIT [ABNORMAL3] • C1906 CONTROL UNIT [ABNORMAL5] • C1907 CONTROL UNIT [ABNORMAL4] • C1908 CONTROL UNIT [ABNORMAL7] • C1909 CONTROL UNIT [ABNORMAL6] • C1922 CONTROL UNIT [ABNORMAL8] • C1925 AD CONVERTER • C1927 CONTROL UNIT [ABNORMAL5] • C1928 CONTROL UNIT [ABNORMAL9] • C1933 CONTROL UNIT
3	• C1902 MOTOR OUTPUT [REV CURRENT] • C1903 MOTOR OUTPUT [NO CURRENT] • C1904 MOTOR OUTPUT [OVERCURRENT] • C1910 MOTOR OUTPUT [MOTOR LOCK] • C1911 MOTOR VOLTAGE [LOW 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 • C1929 VDC

DTC Index

INFOID:0000000005235460

DTC	Items (CONSULT screen terms)	Reference
C1900	CONTROL UNIT [ABNORMAL1]	STC-42, "DTC Logic"
C1901	CONTROL UNIT [ABNORMAL2]	STC-42, "DTC Logic"
C1902	MOTOR OUTPUT [REV CURRENT]	STC-44, "DTC Logic"
C1903	MOTOR OUTPUT [NO CURRENT]	STC-44, "DTC Logic"
C1904	MOTOR OUTPUT [OVERCURRENT]	STC-44, "DTC Logic"
C1905	CONTROL UNIT [ABNORMAL3]	STC-48, "DTC Logic"
C1906	CONTROL UNIT [ABNORMAL5]	STC-42, "DTC Logic"
C1907	CONTROL UNIT [ABNORMAL4]	STC-42, "DTC Logic"
C1908	CONTROL UNIT [ABNORMAL7]	STC-48, "DTC Logic"
C1909	CONTROL UNIT [ABNORMAL6]	STC-50, "DTC Logic"
C1910	MOTOR OUTPUT [MOTOR LOCK]	STC-44, "DTC Logic"
C1911	MOTOR VOLTAGE [LOW VOLTAGE]	STC-52, "DTC Logic"
C1912	MOTOR VOLTAGE [BAD OBSTRCT]	STC-52, "DTC Logic"
C1913	MOTOR OUTPUT [ABNORML SIG]	STC-44, "DTC Logic"
C1914	RR ST ANGLE SENSOR [ABNORML VOL]	STC-56, "DTC Logic"
C1915	RR ST ANGLE SENSOR [MAIN SIGNAL]	STC-59, "DTC Logic"
C1916	RR ST ANGLE SENSOR [SUB SIGNAL]	STC-59, "DTC Logic"
C1917	RR ST ANGLE SENSOR [OFFSET SIG1]	STC-62, "DTC Logic"
C1918	RR ST ANGLE SENSOR [OFFSET SIG2]	STC-62, "DTC Logic"
C1919	VEHICLE SPEED SEN [NO SIGNAL]	STC-65, "DTC Logic"
C1920	STEERING ANGLE SEN [NO SIGNAL]	STC-67, "DTC Logic"
C1921	ENG REV SIGNAL	STC-69, "DTC Logic"
C1922	CONTROL UNIT [ABNORMAL8]	STC-48, "DTC Logic"
C1923	STEERING ANGLE SEN [NO CHANGE]	STC-71, "DTC Logic"
C1924	STEERING ANGLE SEN [NO NEUT STATE]	STC-73, "DTC Logic"
C1925	AD CONVERTER	STC-48, "DTC Logic"
C1926	STEERING ANGLE SEN	STC-75, "DTC Logic"

DTC	Items (CONSULT screen terms)	Reference
C1927	CONTROL UNIT [ABNORMAL5]	STC-42, "DTC Logic"
C1928	CONTROL UNIT [ABNORMAL9]	STC-48, "DTC Logic"
C1929	VDC	STC-77, "DTC Logic"
C1933	CONTROL UNIT	STC-48, "DTC Logic"
U1000	CAN COMM CIRCUIT	STC-79, "DTC Logic"
U1010	CONTROL UNIT (CAN)	STC-80, "DTC Logic"

SYMPTOM DIAGNOSIS

RAS WARNING LAMP DOSE NOT TURN ON

Description

INFOID:0000000005549754

RAS warning lamp does not turns ON when turning ignition switch ON from OFF.

Diagnosis Procedure

INFOID:0000000005549755

1. CHECK RAS SYSTEM POWER SUPPLY AND GROUND CIRCUIT

Perform the trouble diagnosis of the power supply and ground circuit. Refer to STC-81, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the specific malfunctioning part.

2. CHECK RAS WARNING LAMP

Perform the trouble diagnosis of RAS warning lamp. Refer to STC-85, "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.

RAS WARNING LAMP DOSE NOT TURN OFF

Description

INFOID:0000000005549756

RAS system stops (error) when RAS warning lamp turns ON.

Diagnosis Procedure

INFOID:0000000005549757

1.PERFORM SELF-DIAGNOSIS

With CONSULT-III

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

Is any DTC detected?

YES >> Repair or replace the specific malfunctioning parts.
NO >> GO TO 2.

2.CHECK RAS WARNING LAMP

Perform the trouble diagnosis of RAS warning lamp. Refer to STC-85, "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.

UNBALANCE STEERING WHEEL TURNING FORCE (TORQUE VARIATION)

Description

INFOID:0000000005549758

- 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:0000000005549759

1. CHECK RAS SYSTEM VEHICLE SPEED SIGNAL

Perform the trouble diagnosis of the vehicle speed signal. Refer to STC-65, "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-12, "Inspection" (Power steering fluid), ST-14, "Inspection" (Steering wheel).

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the specific malfunctioning part.

3. CHECK RAS SYSTEM POWER STEERING SOLENOID VALVE

Perform the trouble diagnosis of the power steering solenoid valve. Refer to STC-83, "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.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000005588473

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 which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS 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:0000000005588474

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.

This vehicle is equipped with a push-button ignition switch and a steering lock unit.
If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. 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.)

REMOVAL AND INSTALLATION

RAS CONTROL UNIT

Removal and Installation

INFOID:0000000005235470

REMOVAL

1. Turn the ignition switch OFF.
2. Remove the luggage side finisher lower (LH). Refer to INT-28, "Exploded View".
3. Remove E-SUS control unit. Refer to SCS-61, "Exploded View".
4. Disconnect the RAS control unit connector and harness clip.
5. Remove the RAS control unit mounting bolts.
6. Remove the RAS control unit.

INSTALLATION

Install in the reverse order of removal.

REAR ACTIVE STEER

Exploded View

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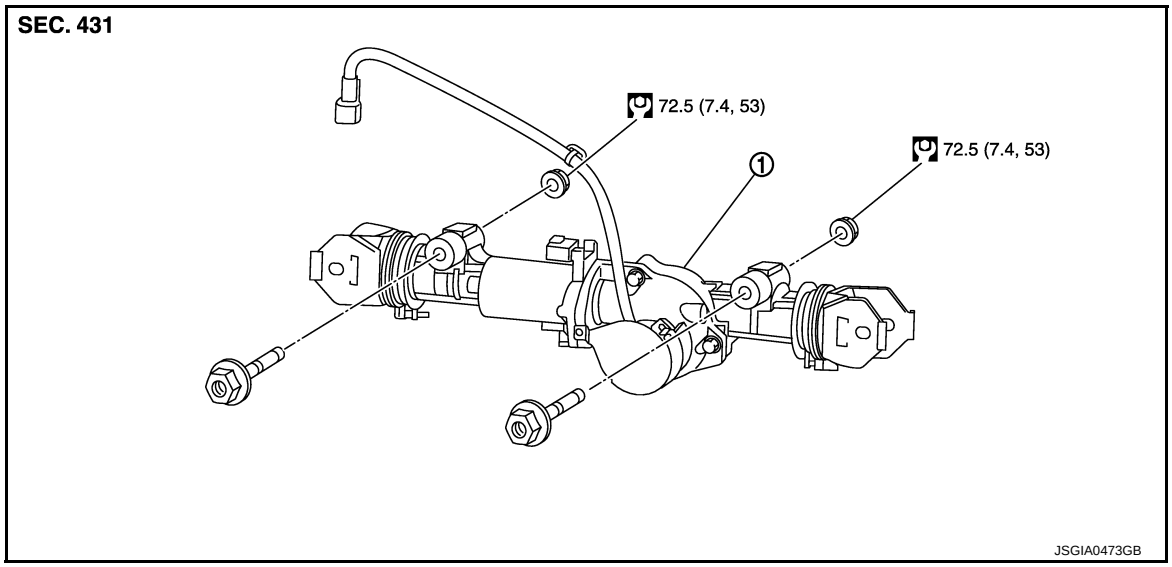
COMPONENTS



1. RAS actuator assembly

Refer to GI-4, "Components", for the symbols in the figure.

Removal and Installation

INFOID:0000000005235472

REMOVAL

1. Remove coil spring and rear lower link. Refer to RSU-8, "Exploded View".
2. Disconnect harness connector from RAS actuator assembly and rear suspension member.
3. Remove fixing bolts and nuts of RAS actuator assembly, and then remove RAS actuator assembly from rear suspension member.

INSTALLATION

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

- When installing RAS actuator assembly to rear suspension member, check the mounting surfaces of RAS actuator assembly and rear suspension member for oil, dirt, sand, or other foreign materials.
- Check rear wheel alignment. Refer to RSU-6, "Inspection".
- Adjust neutral position of steering angle sensor. Refer to BRC-9, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".