SECTION RF

ROOF

CONTENTS

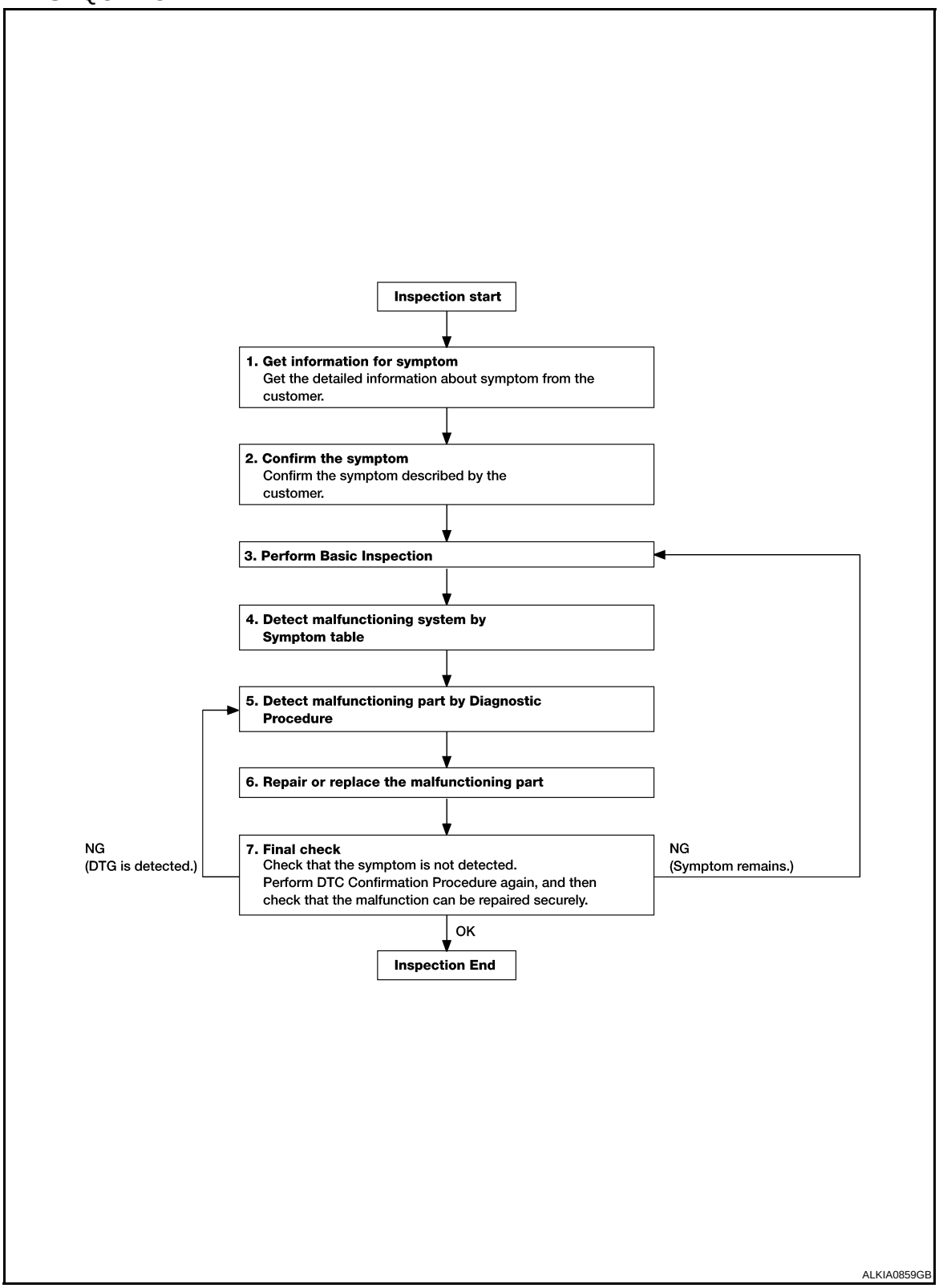
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000003229868

OVERALL SEQUENCE



DETAILED FLOW

1. GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred).

>> GO TO 2

2. CONFIRM THE SYMPTOM

Confirm the symptom described by the customer.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 3

3. PERFORM BASIC INSPECTION

Perform RF-10, "SUNROOF MOTOR ASSEMBLY : Special Repair Requirement".

Inspection End>>GO TO 4

4. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Detect malfunctioning system according to symptom diagnosis based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

>> GO TO 5

5. DETECT MALFUNCTIONING PART BY DIAGNOSTIC PROCEDURE

Inspect according to Diagnostic Procedure of the system.
NOTE:
The Diagnostic Procedure described based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnostic Procedure.

Is malfunctioning part detected?

YES >> GO TO 6
NO >> Check voltage of related BCM terminals using CONSULT-III.

6. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnostic Procedure.

>> GO TO 7

7. FINAL CHECK

When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Does the symptom reappear?

YES >> GO TO 5
NO >> Inspection End.

INSPECTION AND ADJUSTMENT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

INFOID:0000000003229869

MEMORY RESET PROCEDURE

1. Please observe the following instructions at confirming the sunroof operation.
   NOTE:
   Do not disconnect the electronic power while the sunroof is operating or within 5 seconds after the sunroof stops (to wipe-out the memory of lid position and operating friction).
2. Initialization of system should be conducted after the following conditions.
   - When the battery has been disconnected or discharged.
   - When the sunroof motor has been disconnected from power.
   - When the sunroof motor is changed.
   - When the sunroof does not operate normally (Incomplete initialization conditions).

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement

INFOID:0000000003229870

INITIALIZATION PROCEDURE

If the sunroof does not close or open automatically, use the following procedure to return sunroof operation to normal.

1. Turn ignition switch ON.
2. Push and hold the sunroof tilt switch in the forward (DOWN) position until the sunroof is fully closed.
3. After the sunroof has closed all the way, push and hold the tilt switch forward (DOWN) again for more than 2 seconds to re-learn motor position.
4. Initialization is complete if the sunroof operates normally.

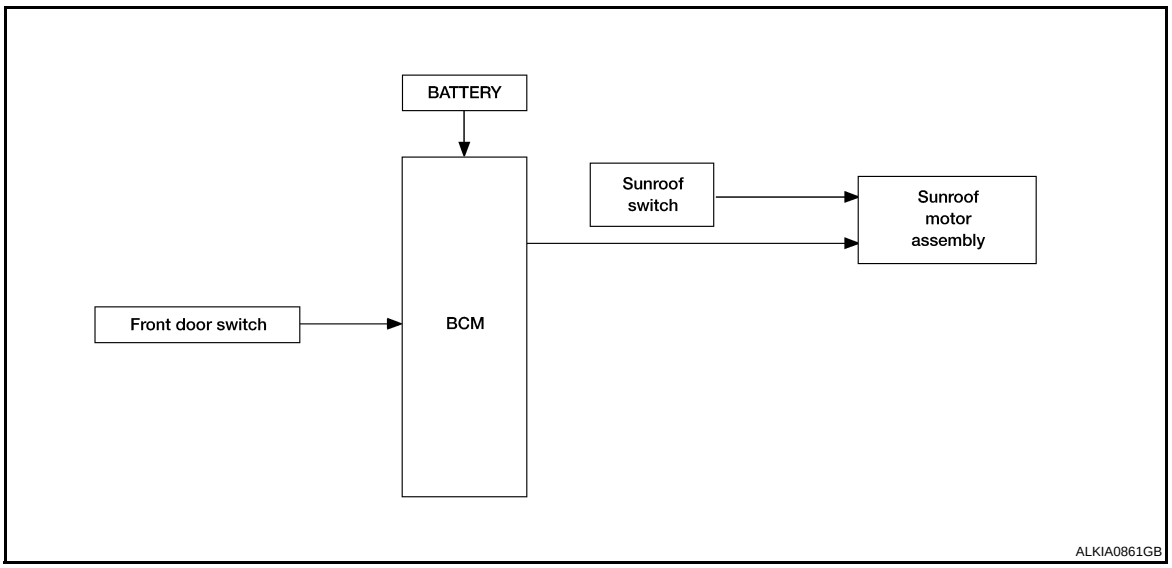
FUNCTION DIAGNOSIS

SUNROOF SYSTEM

System Diagram

INFOID:0000000003229871

SUNROOF



System Description

INFOID:0000000003229872

SUNROOF SYSTEM

INPUT/OUTPUT SIGNAL CHART

Item	Input signal to sunroof motor assembly	Sunroof motor function	Actuator
Sunroof switch	Sunroof switch signal (tilt down or slide open)	Sunroof control	Sunroof motor
	Sunroof switch signal (tilt up or slide close)		
BCM	RAP signal		

SUNROOF OPERATION

- The sunroof motor assembly operates with a power supply that is output from the BCM while the ignition switch is ON or retained power is operating.
- The tilt up/down & slide open/close signals from the sunroof switch enable the sunroof motor to move arbitrarily.

AUTO OPERATION

The sunroof AUTO feature makes it possible to slide open and slide close or tilt up and tilt down the sunroof without holding the sunroof switch in the slide open/tilt down or slide close/tilt up position.

RETAINED POWER OPERATION

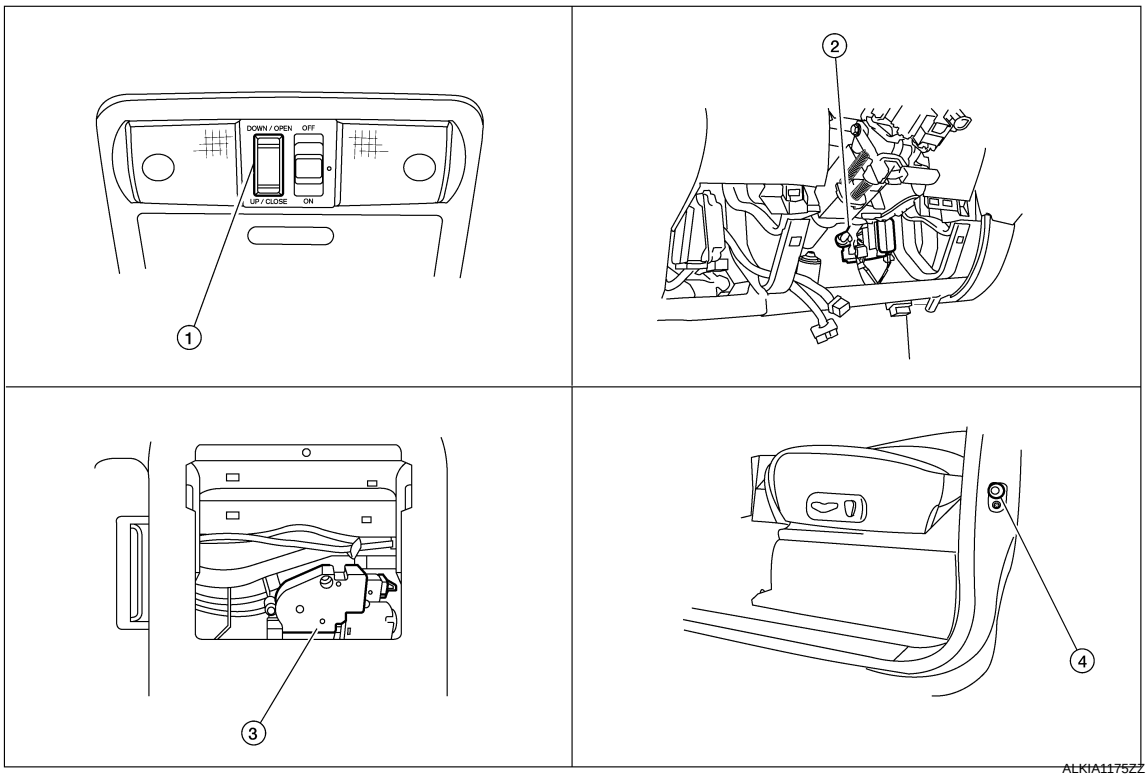
Retained power operation is an additional power supply function that enables the sunroof system to operate up to 45 seconds after the ignition switch is turned OFF.

Retained power function cancel conditions

- When a front door is opened (door switch ON)
- When ignition switch is turned ON again.
- When 45 seconds elapse on the timer.

Component Parts Location

INFOID:0000000003229873



1. Sunroof switch R4
2. BCM M18, M19, M20 (View with instrument panel removed)
3. Sunroof motor assembly B83
4. Front door switch LH B8, RH B108

Component Description

INFOID:0000000003229874

Component	Function
BCM	Supplies power to the sunroof motor assembly.
Sunroof switch	Transmits tilt up/down & slide open/close operation signal to sunroof motor assembly.
Sunroof motor assembly	The sunroof motor and integrated CPU enables tilt up/down & slide open/close as requested by the sunroof switch.
Front door switch	Detects door open/close condition and transmits to BCM.

DIAGNOSIS SYSTEM (BCM)
COMMON ITEM
COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000003229875

APPLICATION ITEM
CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
WORK SUPPORT	Changes the setting for each system function.
SELF-DIAG RESULTS	Displays the diagnosis results judged by BCM. Refer to BCS-14, "BCM : CONSULT-III Function (BCM - BCM)".
CAN DIAG SUPPORT MNTR	Monitors the reception status of CAN communication viewed from BCM.
DATA MONITOR	The BCM input/output signals are displayed.
ACTIVE TEST	The signals used to activate each device are forcibly supplied from BCM.
ECU IDENTIFICATION	The BCM part number is displayed.
CONFIGURATION	This function is not used even though it is displayed.

RETAINED PWR
RETAINED PWR : CONSULT-III Function (BCM - RETAINED PWR)

INFOID:0000000003229876

WORK SUPPORT

Work Support Item	Description
RETAINED PWR SET	MODE 1 MODE 2 MODE 3

DATA MONITOR

Monitor Item	Description
IGN ON SW	Indicates [ON/OFF] condition of the ignition switch.
DOOR SW-DR	Indicates [ON/OFF] condition of the front door switch LH.
DOOR SW-AS	Indicates [ON/OFF] condition of the front door switch RH.

ACTIVE TEST

Active Test Item	Description
RETAINED PWR	Turns retained power function [ON/OFF].

COMPONENT DIAGNOSIS

POWER SUPPLY AND GROUND CIRCUIT

SUNROOF MOTOR ASSEMBLY

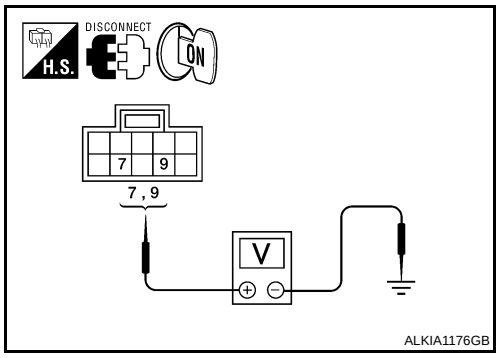
SUNROOF MOTOR ASSEMBLY : Diagnosis Procedure

INFOID:0000000003229877

SUNROOF MOTOR ASSEMBLY

1. CHECK SUNROOF MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect sunroof motor assembly connector B83.
3. Turn ignition switch ON.
4. Check voltage between sunroof motor assembly connector B83 terminals 7 and 9 and ground.



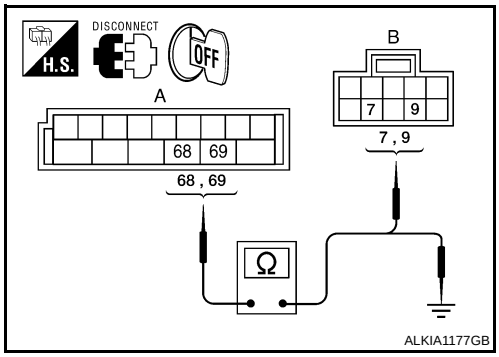
(+)		(–)	Voltage
Connector	Terminal		
B83	7	Ground	Battery voltage
	9		

Is the voltage as specified?

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

2. CHECK SUNROOF MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect BCM connector M20.
3. Check continuity between BCM connector M20 (A) and sunroof motor assembly connector B83 (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M20	68	B83	9	Yes
	69		7	

4. Check continuity between BCM connector M20 (A) and ground.

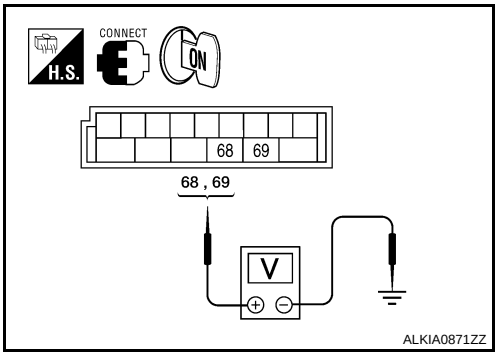
A		—	Continuity
Connector	Terminal		
M20	68	Ground	No
	69		

Are the continuity test results as specified?

YES >> GO TO 3
NO >> Repair or replace harness.

3. CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector M20.
2. Turn ignition switch ON.
3. Check voltage between BCM connector M20 and ground.



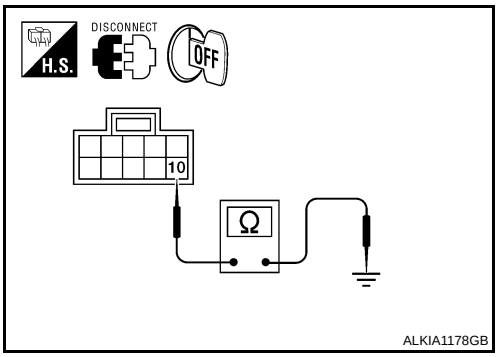
(+)		(–)	Voltage
Connector	Terminal		
M20	68	Ground	Battery voltage
	69		

Is the voltage reading as specified?

YES >> Check condition of harness and connector.
NO >> Replace BCM. Refer to BCS-49, "Removal and Installation".

4. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between sunroof motor assembly connector B83 terminal 10 and ground.



Connector	Terminal	—	Continuity
B83	10	Ground	Yes

Is the continuity test result as specified?

YES >> Power supply and ground circuits are OK.
NO >> Repair or replace harness.

SUNROOF MOTOR ASSEMBLY : Special Repair Requirement

INFOID:0000000003229878

1. PERFORM INITIALIZATION PROCEDURE

Perform initialization procedure.
Refer to RF-5, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement".

Does the sunroof motor assembly operate properly?

YES >> Repair is complete.
NO >> Check fitting adjustment.

SUNROOF SWITCH CIRCUIT

Description

INFOID:0000000003229879

The BCM supplies power to the integrated CPU of the sunroof motor assembly. The tilt and slide functions of the sunroof motor assembly is controlled by the sunroof switch.

Component Function Check

INFOID:0000000003229880

1. CHECK SUNROOF MOTOR FUNCTION

Do tilt up/down & slide open/close functions operate normally with sunroof switch?

Is the inspection result normal?

YES >> Sunroof motor assembly is OK.
NO >> Refer to RF-11, "Diagnosis Procedure".

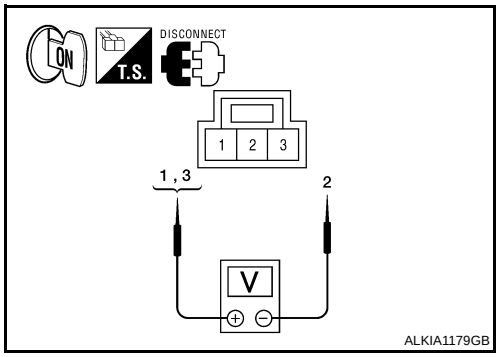
Diagnosis Procedure

INFOID:0000000003229881

1. CHECK SUNROOF SWITCH INPUT SIGNAL

1. Turn ignition switch ON.
2. Check voltage between sunroof switch connector and ground.

Connector	Terminals (+)	Terminals (–)	Sunroof switch position	Voltage (V) (Approx.)
R4	1	2	DOWN/OPEN	0V
			Other than above	Battery voltage
	3		UP/CLOSE	0V
			Other than above	Battery voltage



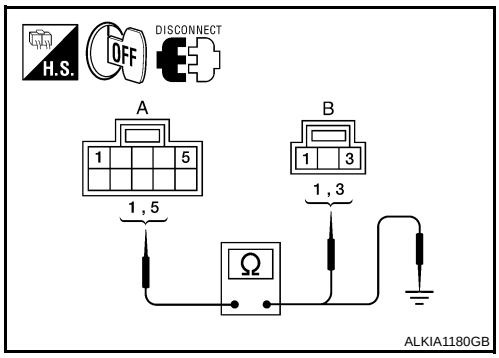
Are the voltage measurements as specified?

YES >> Sunroof switch is operating normally.
NO >> GO TO 2

2. CHECK SUNROOF SWITCH CIRCUITS

1. Turn ignition switch OFF.
2. Disconnect sunroof motor assembly connector B83 and sunroof switch connector R4.
3. Check continuity between sunroof motor assembly connector B83 (A) and sunroof switch connector R4 (B) and .

A		B		Continuity
Connector	Terminal	Connector	Terminal	
B83	1	R4	3	Yes
	5		1	



4. Check continuity between sunroof motor assembly connector B83 (A) and ground.

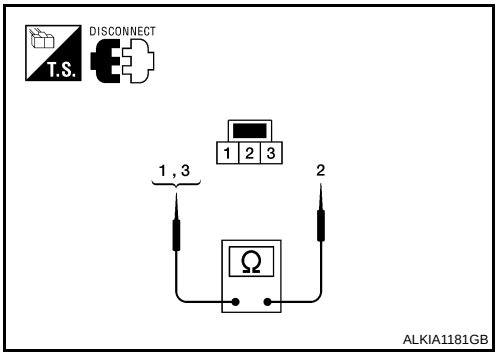
A		—	Continuity
Connector	Terminal		
B83	5	Ground	No
	1		

Are the continuity test results as specified?

YES >> GO TO 3
NO >> Repair harness or connector.

3. CHECK SUNROOF SWITCH

1. Check continuity between sunroof switch terminals.



Terminals		Sunroof switch position	Continuity
1	2	DOWN/OPEN	Yes
		Other than above	No
3		UP/CLOSE	Yes
		Other than above	No

Are the continuity test results as specified?

YES >> Sunroof switch is operating normally.
NO >> Replace sunroof switch (map lamp assembly). Refer to INT-23, "Removal and Installation".

DOOR SWITCH

Description

INFOID:0000000003229882

Detects door open/close condition and transmits the signal to BCM.

Component Function Check

INFOID:0000000003229883

1. CHECK DOOR SWITCH INPUT SIGNAL

Check (“DOOR SW-DR” and “DOOR SW-AS”) in “DATA MONITOR” mode with CONSULT-III.

Monitor item	Condition	
DOOR SW-DR	OPEN	: ON
	CLOSE	: OFF
DOOR SW-AS	OPEN	: ON
	CLOSE	: OFF

Is the inspection result normal?

YES >> Door switch circuit is OK.
NO >> Refer to RF-13, "Diagnosis Procedure".

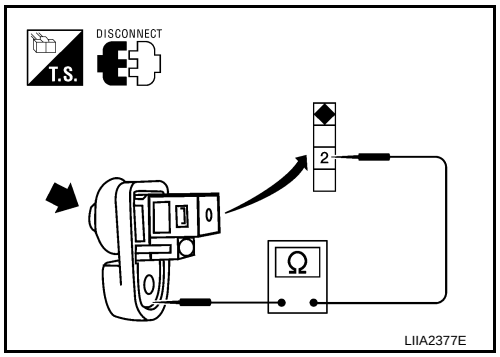
Diagnosis Procedure

INFOID:0000000003229884

1. CHECK FRONT DOOR SWITCH

Check front door switches.

Terminal		Switch condition	Continuity
2	Ground	Pressed	No
		Released	Yes



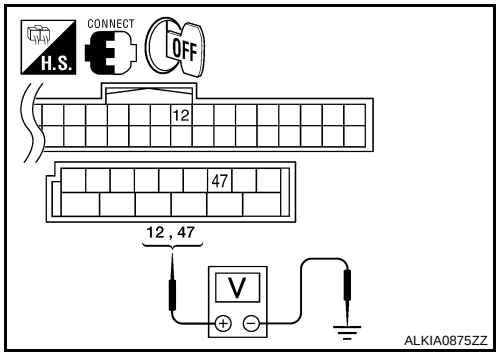
Are the continuity test results as specified?

YES >> GO TO 2
NO >> Replace front door switch.

2. CHECK FRONT DOOR SWITCH INPUT SIGNAL

Check voltage between BCM connectors M18 and M19 and ground.

(+)		(–)	Front door condition		Voltage
Connector	Terminal				
M18	12	Ground	RH	OPEN	0V
				CLOSE	Battery voltage
M19	47		LH	OPEN	0V
				CLOSE	Battery voltage

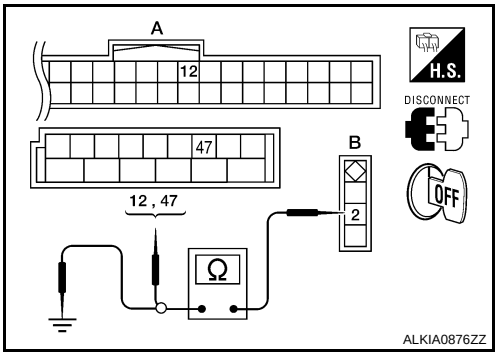


Are the voltage readings as specified?

YES >> Replace BCM. Refer to BCS-49, "Removal and Installation".
NO >> GO TO 3

3. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect BCM connectors M18 and M19 and front door switch connectors B8 and B108.
3. Check continuity between BCM connectors M18 and M19 (A) and front door switch connectors B8 and B108 (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M18	12	RH	B108	2	Yes
M19	47	LH	B8		

4. Check continuity between BCM connectors M18 and M19 (A) and ground.

A		—	Continuity
Connector	Terminal		
M18	12	Ground	No
M19	47		

Are the continuity test results as specified?

YES >> Replace BCM. Refer to BCS-49, "Removal and Installation".
NO >> Repair or replace harness.

ECU DIAGNOSIS

BCM (BODY CONTROL MODULE)

Reference Value

INFOID:0000000003292958

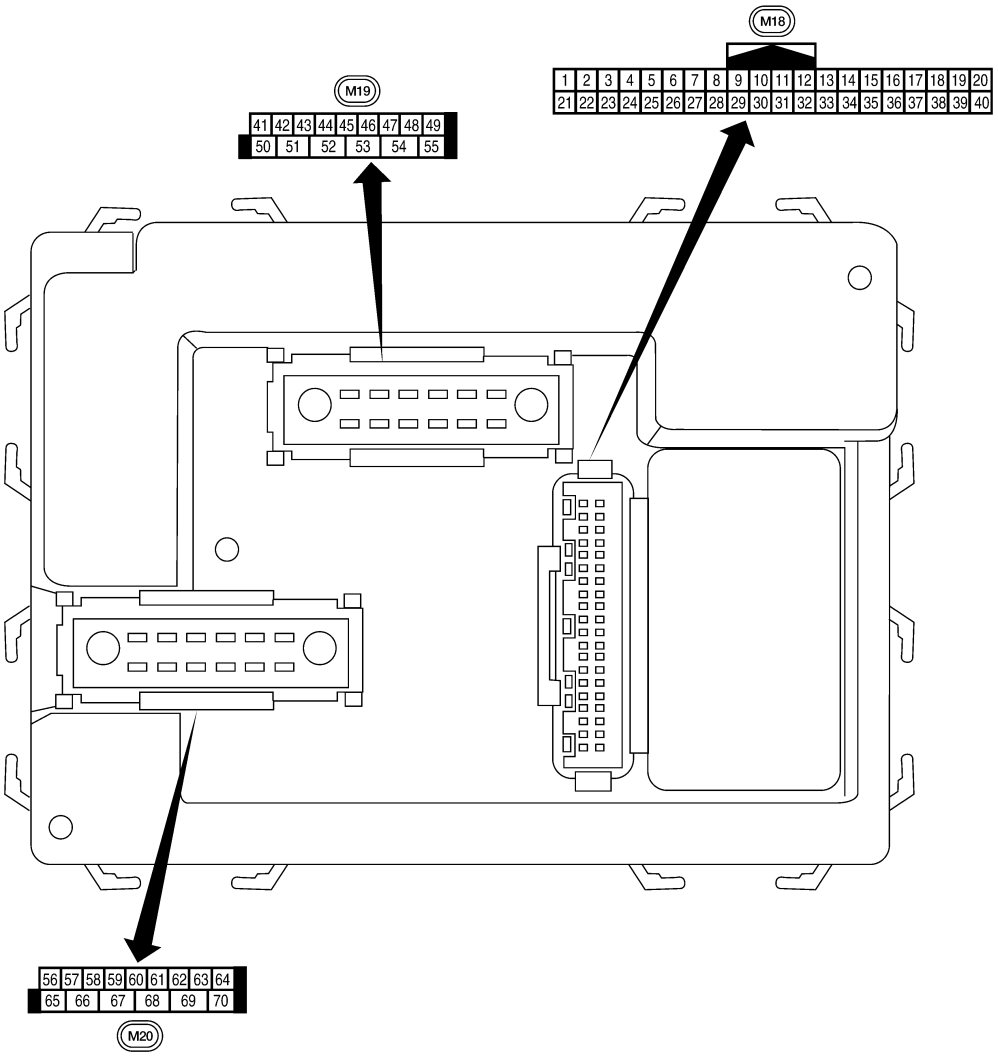
VALUES ON THE DIAGNOSIS TOOL

Monitor Item	Condition	Value/Status
AIR COND SW	A/C switch OFF	OFF
	A/C switch ON	ON
CDL LOCK SW	Door lock/unlock switch does not operate	OFF
	Press door lock/unlock switch to the LOCK side	ON
CDL UNLOCK SW	Door lock/unlock switch does not operate	OFF
	Press door lock/unlock switch to the UNLOCK side	ON
DOOR SW-AS	Front door RH closed	OFF
	Front door RH opened	ON
DOOR SW-DR	Front door LH closed	OFF
	Front door LH opened	ON
DOOR SW-RL	Rear door LH closed	OFF
	Rear door LH opened	ON
DOOR SW-RR	Rear door RH closed	OFF
	Rear door RH opened	ON
ENGINE RUN	Engine stopped	OFF
	Engine running	ON
FR FOG SW	Front fog lamp switch OFF	OFF
	Front fog lamp switch ON	ON
FR WASHER SW	Front washer switch OFF	OFF
	Front washer switch ON	ON
FR WIPER LOW	Front wiper switch OFF	OFF
	Front wiper switch LO	ON
FR WIPER HI	Front wiper switch OFF	OFF
	Front wiper switch HI	ON
FR WIPER INT	Front wiper switch OFF	OFF
	Front wiper switch INT	ON
FR WIPER STOP	Any position other than front wiper stop position	OFF
	Front wiper stop position	ON
HAZARD SW	When hazard switch is not pressed	OFF
	When hazard switch is pressed	ON
LIGHT SW 1ST	Lighting switch OFF	OFF
	Lighting switch 1st	ON
HEADLAMP SW1	Headlamp switch OFF	OFF
	Headlamp switch 1st	ON
HEADLAMP SW2	Headlamp switch OFF	OFF
	Headlamp switch 1st	ON
HI BEAM SW	High beam switch OFF	OFF
	High beam switch HI	ON

Monitor Item	Condition	Value/Status
H/L WASH SW	**NOTE:** The item is indicated, but not monitored	OFF
IGN ON SW	Ignition switch OFF or ACC	OFF
	Ignition switch ON	ON
IGN SW CAN	Ignition switch OFF or ACC	OFF
	Ignition switch ON	ON
INT VOLUME	Wiper intermittent dial is in a dial position 1 - 7	1 - 7
KEY ON SW	Mechanical key is removed from key cylinder	OFF
	Mechanical key is inserted to key cylinder	ON
KEYLESS LOCK	LOCK button of key fob is not pressed	OFF
	LOCK button of key fob is pressed	ON
KEYLESS UNLOCK	UNLOCK button of key fob is not pressed	OFF
	UNLOCK button of key fob is pressed	ON
OIL PRESS SW	• Ignition switch OFF or ACC • Engine running	OFF
	Ignition switch ON	ON
PASSING SW	Other than lighting switch PASS	OFF
	Lighting switch PASS	ON
RKE LOCK AND UN-LOCK	**NOTE:** The item is indicated, but not monitored	OFF
		ON
TAIL LAMP SW	Lighting switch OFF	OFF
	Lighting switch 1ST	ON
TURN SIGNAL L	Turn signal switch OFF	OFF
	Turn signal switch LH	ON
TURN SIGNAL R	Turn signal switch OFF	OFF
	Turn signal switch RH	ON
VEHICLE SPEED	While driving	Equivalent to speedometer reading

Terminal Layout

INFOID:0000000003292959



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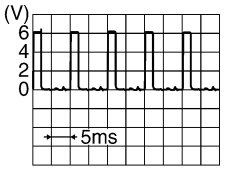
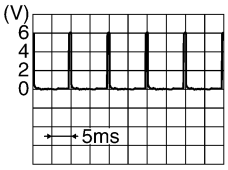
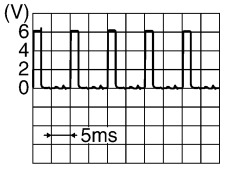
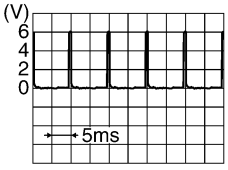
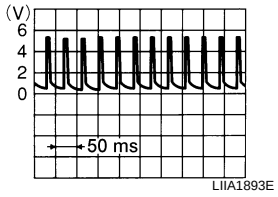
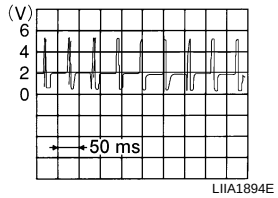
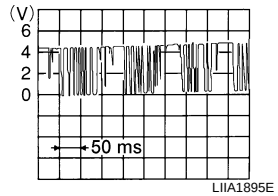
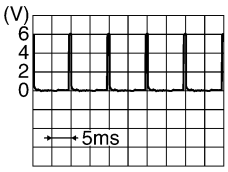
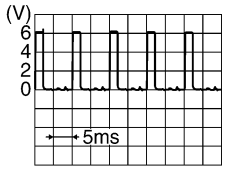
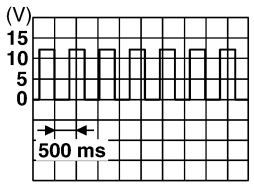
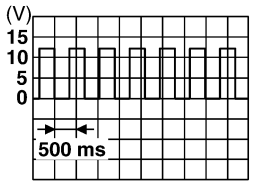
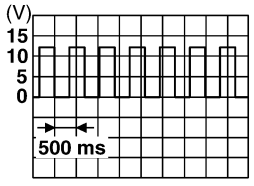
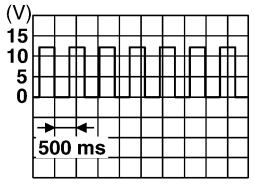
Physical Values

INFOID:0000000003292960

Terminal	Wire color	Item	Signal input/ output	Measuring condition		Reference value or waveform (Approx.)
				Ignition switch	Operation or condition	
1	BR	Ignition keyhole illumination	Output	OFF	Door is locked (SW OFF)	Battery voltage
					Door is unlocked (SW ON)	0V
2	P	Combination switch input 5	Input	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
3	SB	Combination switch input 4	Input	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
4	V	Combination switch input 3	Input	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
5	L	Combination switch input 2	Input	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
6	R	Combination switch input 1				
7	GR	Front door lock assembly LH (key cylinder switch) unlock	Input	OFF	ON (open, 2nd turn)	Momentary 1.5V
					OFF (closed)	0V
8	SB	Front door lock assembly LH (key cylinder switch) lock	Input		On (open)	Momentary 1.5V
					OFF (closed)	0V
9	Y	Rear window defogger switch	Input	ON	Rear window defogger switch ON	0V
					Rear window defogger switch OFF	5V
11	G/B	Ignition switch (ACC or ON)	Input	ACC or ON	Ignition switch ACC or ON	Battery voltage
12	LG	Front door switch RH (All)	Input	OFF	ON (open)	0V
		Rear door switch upper RH (King Cab)			OFF (closed)	Battery voltage
		Rear door switch lower RH (King Cab)				

Terminal	Wire color	Item	Signal input/ output	Measuring condition		Reference value or waveform (Approx.)
				Ignition switch	Operation or condition	
13	L	Rear door switch RH (Crew Cab)	Input	OFF	ON (open)	0V
					OFF (closed)	Battery voltage
15	W	Tire pressure warning check connector	Input	OFF	—	5V
18	BR	Remote keyless entry receiver (Ground)	Output	OFF	—	0V
19	V	Remote keyless entry receiver (power supply)	Output	OFF	Ignition switch OFF	 LIIA1893E
20	G	Remote keyless entry receiver signal (Signal)	Input	OFF	Stand-by (keyfob buttons released)	 LIIA1894E
					When remote keyless entry receiver receives signal from keyfob (keyfob buttons pressed)	 LIIA1895E
21	GR	NATS antenna amp.	Input	OFF → ON	Ignition switch (OFF → ON)	Just after turning ignition switch ON: Pointer of tester should move.
23	G	Security indicator lamp	Output	OFF	Goes OFF → illuminates (Every 2.4 seconds)	Battery voltage → 0V
25	BR	NATS antenna amp.	Input	OFF → ON	Ignition switch (OFF → ON)	Just after turning ignition switch ON: Pointer of tester should move.
27	W	Compressor ON signal	Input	ON	A/C switch OFF	5V
					A/C switch ON	0V
28	R	Front blower monitor	Input	ON	Front blower motor OFF	Battery voltage
					Front blower motor ON	0V
29	G	Hazard switch	Input	OFF	ON	0V
					OFF	5V
31	GR	Cargo lamp switch	Input	OFF	ON	0V
					OFF	Battery voltage

Terminal	Wire color	Item	Signal input/ output	Measuring condition		Reference value or waveform (Approx.)
				Ignition switch	Operation or condition	
32	O	Combination switch output 5	Output	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
33	GR	Combination switch output 4	Output	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
34	G	Combination switch output 3	Output	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E
35	BR	Combination switch output 2	Output	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5292E
36	LG	Combination switch output 1				
37	B	Key switch	Input	OFF	Key inserted	Battery voltage
					Key removed	0V
38	W/R	Ignition switch (ON)	Input	ON	—	Battery voltage
39	L	CAN-H	—	—	—	—
40	P	CAN-L	—	—	—	—
45	V	Lock switch	Input	OFF	ON (lock)	0V
					OFF	Battery voltage
46	LG	Unlock switch	Input	OFF	ON (unlock)	0V
					OFF	Battery voltage
47	GR	Front door switch LH (All)	Input	OFF	ON (open)	0V
		Rear door switch upper LH (King Cab)			OFF (closed)	Battery voltage
		Rear door switch lower LH (King Cab)				
48	P	Rear door switch LH (Crew Cab)	Input	OFF	ON (open)	0V
					OFF (closed)	Battery voltage
50	P	Cargo lamp	Output	OFF	Any door open (ON)	0V
					All doors closed (OFF)	Battery voltage

Terminal	Wire color	Item	Signal input/ output	Measuring condition		Reference value or waveform (Approx.)
				Ignition switch	Operation or condition	
51	G	Trailer turn signal (right)	Output	ON	Turn right ON	 SKIA3009J
52	V	Trailer turn signal (left)	Output	ON	Turn left ON	 SKIA3009J
56	V	Battery saver output	Output	OFF	30 minutes after ignition switch is turned OFF	0V
				ON	—	Battery voltage
57	R/Y	Battery power supply	Input	—	—	Battery voltage
58	W	Optical sensor	Input	ON	When optical sensor is illuminated	3.1V or more
					When optical sensor is not illuminated	0.6V or less
59	GR	Front door lock assembly LH (unlock)	Output	OFF	OFF (neutral)	0V
					ON (unlock)	Battery voltage
60	LG	Turn signal (left)	Output	ON	Turn left ON	 SKIA3009J
61	G	Turn signal (right)	Output	ON	Turn right ON	 SKIA3009J
63	BR	Interior room/map lamp	Output	OFF	Any door switch: ON (open)	0V
					Any door switch: OFF (closed)	Battery voltage
65	V	All door lock actuators (lock)	Output	OFF	OFF (neutral)	0V
					ON (lock)	Battery voltage
66	L	Front door lock actuator RH, rear door lock actuators LH/RH (unlock)	Output	OFF	OFF (neutral)	0V
					ON (unlock)	Battery voltage
67	B	Ground	Input	ON	—	0V

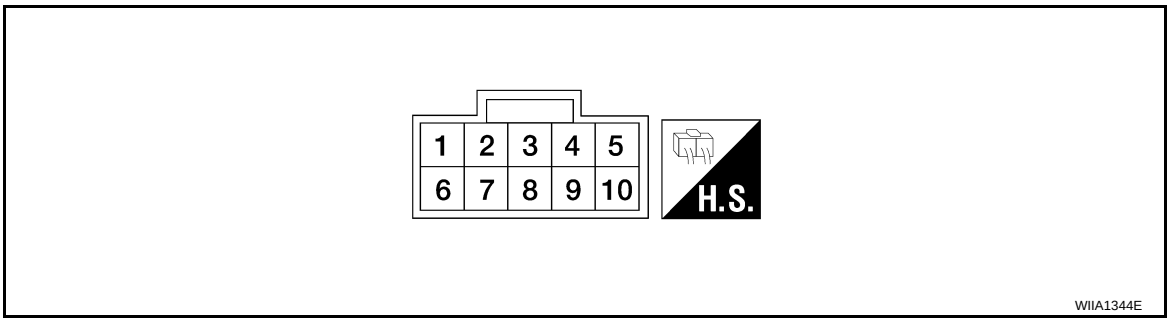
Terminal	Wire color	Item	Signal input/ output	Measuring condition		Reference value or waveform (Approx.)
				Ignition switch	Operation or condition	
68	O	Power window power supply (RAP)	Output	—	Ignition switch ON	Battery voltage
					Within 45 seconds after ignition switch OFF	Battery voltage
					More than 45 seconds after ignition switch OFF	0V
					When front door LH or RH is open or power window timer operates	0V
69	P	Power window power supply (BAT)	Output	OFF	—	Battery voltage
70	W	Battery power supply	Input	OFF	—	Battery voltage

SUNROOF MOTOR ASSEMBLY

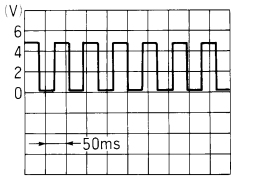
Reference Value

INFOID:0000000003229886

TERMINAL LAYOUT

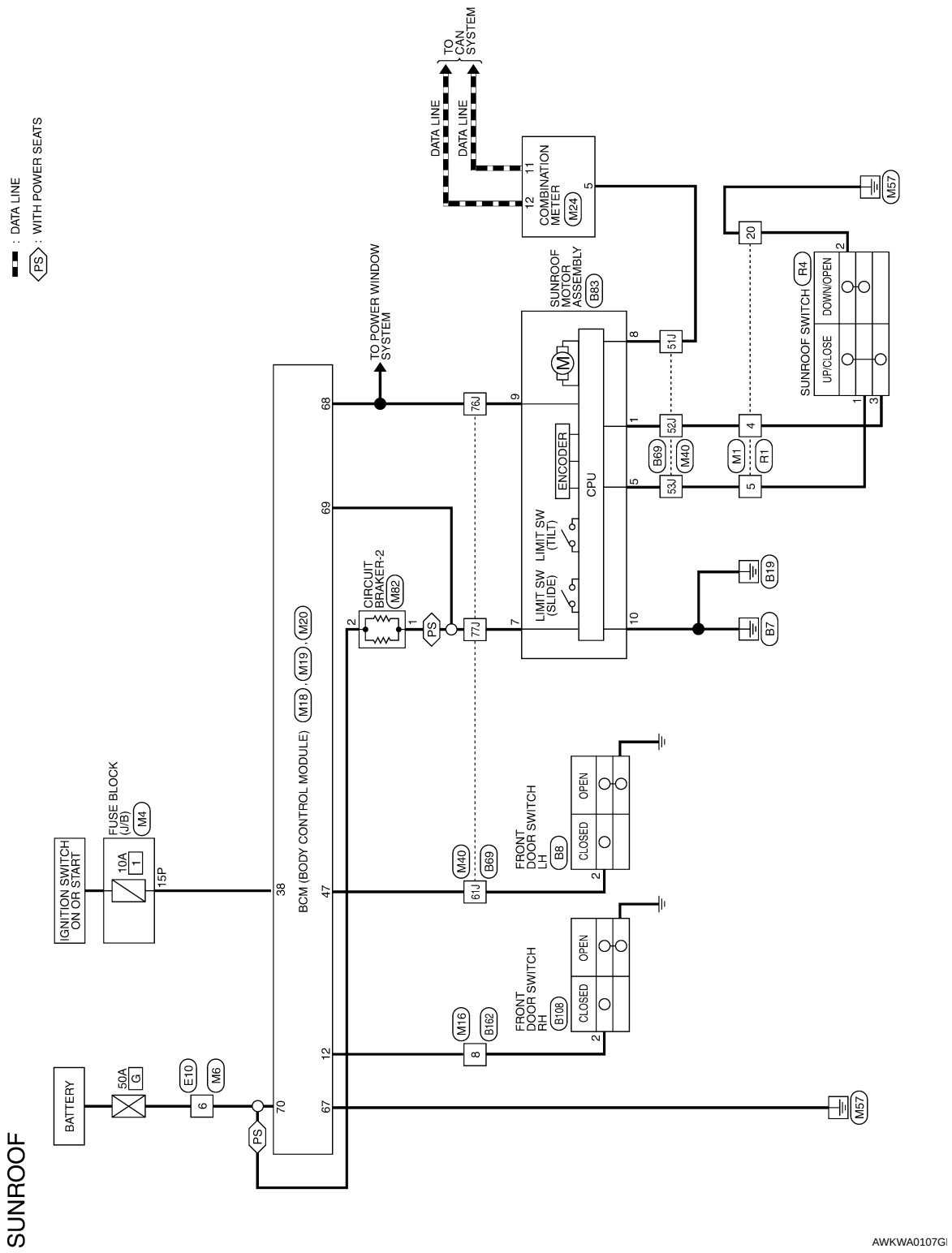


PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition	Voltage (V) (Approx.)
+	-	Signal name	Input/ Output		
1 (SB)	Ground	Sunroof switch (UP/ CLOSE) signal	Input	Ignition switch ON and sunroof switch in UP/CLOSE position	0V
				Ignition switch ON and sunroof switch in OFF position	Battery voltage
5 (R)	Ground	Sunroof switch (DOWN/ OPEN) signal	Input	Ignition switch ON and sunroof switch in DOWN/OPEN position	0V
				Ignition switch ON and sunroof switch in OFF position	Battery voltage
7 (P)	Ground	BAT power supply	Input	—	Battery voltage
8 (W)	Ground	Vehicle speed signal	Input	Speedometer operated [when vehicle speed is approx. 40 km/h (25 MPH)]	 ELF1080D
9 (SB)	Ground	RAP signal	Input	Ignition switch ON	Battery voltage
				Within 45 seconds after ignition switch turned OFF	Battery voltage
				When front door LH or RH is opened while retained power is operating	0V
10 (B)	Ground	Ground	Input	—	0V

Wiring Diagram

INFOID:0000000003229887



SUNROOF CONNECTORS

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE

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

Terminal No.	Color of Wire	Signal Name
4	SB	–
5	R	–
20	B	–

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
15P	W/R	–

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

3	2	1
6	5	4

Terminal No.	Color of Wire	Signal Name
6	W	–

Connector No.	M16
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

6	5	4	3	2	1
12	11	10	9	8	7

Terminal No.	Color of Wire	Signal Name
8	LG	–

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE

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	37	38	39	40

Terminal No.	Color of Wire	Signal Name
12	LG	DR-SW-AS
38	W/R	IGN SW

Connector No.	M19
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE

H.S.

41	42	43	44	45	46	47	48	49
50	51	52	53	54	55			

Terminal No.	Color of Wire	Signal Name
47	GR	DR-SW-DR

AWKIA0319GB

Connector No.	M20
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

56	57	58	59	60	61	62	63	64
65	66	67	68	69	70			

Terminal No.	Color of Wire	Signal Name
67	B	GND
68	O	POWER WINDOW POWER SUPPLY (RAP)
69	P	POWER WINDOW POWER SUPPLY (BAT)
70	W	BAT (F/L)

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

H.S.

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21

Terminal No.	Color of Wire	Signal Name
5	W	–
11	P	CAN-L
12	L	CAN-H

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

5J	4J	3J	2J	1J
10J	9J	8J	7J	6J

21J	20J	19J	18J	17J	16J	15J	14J	13J	12J	11J
	30J	29J	28J	27J	26J	25J	24J	23J	22J	
41J	40J	39J	38J	37J	36J	35J	34J	33J	32J	31J
	50J	49J	48J	47J	46J	45J	44J	43J	42J	
61J	60J	59J	58J	57J	56J	55J	54J	53J	52J	51J
	70J	69J	68J	67J	66J	65J	64J	63J	62J	

75J	74J	73J	72J	71J
80J	79J	78J	77J	76J

Terminal No.	Color of Wire	Signal Name
51J	W	–
52J	SB	–
53J	R	–
61J	GR	–
76J	SB	–
77J	P	–

Connector No.	E10
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2	3
4	5	6

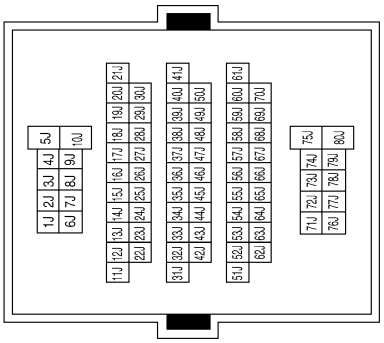
Terminal No.	Color of Wire	Signal Name
6	W	–

AWKIA0320GB

Terminal No.	Color of Wire	Signal Name
51J	W	–
52J	SB	–
53J	R	–
61J	GR	–
76J	SB	–
77J	P	–

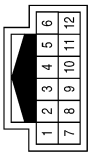
Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



Connector No.	B162
Connector Name	WIRE TO WIRE
Connector Color	WHITE

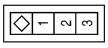
H.S.



Terminal No.	Color of Wire	Signal Name
8	LG	–

Connector No.	B108
Connector Name	FRONT DOOR SWITCH RH
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
2	LG	–

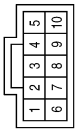
Connector No.	B8
Connector Name	FRONT DOOR SWITCH LH
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
2	GR	–

Connector No.	B83
Connector Name	SUNROOF MOTOR ASSEMBLY
Connector Color	BLACK

H.S.

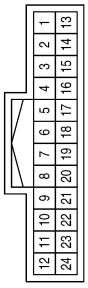


Terminal No.	Color of Wire	Signal Name
1	SB	–
5	R	–
7	P	–
8	W	–
9	SB	–
10	B	–

AWKIA0321GB

Connector No.	R1
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
4	SB	–
5	R	–
20	B	–

Connector No.	R4
Connector Name	SUNROOF SWITCH
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	R	–
2	B	–
3	SB	–

AWKIA0322GB

SYMPTOM DIAGNOSIS

SUNROOF DOES NOT OPERATE PROPERLY

Diagnosis Procedure

INFOID:0000000003229888

1. CHECK BCM POWER SUPPLY AND GROUND CIRCUITS

Check BCM power supply and ground circuits. Refer to BCS-27, "Diagnosis Procedure".

Is the inspection result normal?

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

2. CHECK SUNROOF MOTOR ASSEMBLY POWER SUPPLY AND GROUND CIRCUIT

Check sunroof motor assembly power supply and ground circuit. Refer to RF-9, "SUNROOF MOTOR ASSEMBLY : Diagnosis Procedure".

Is the inspection result normal?

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

3. CHECK SUNROOF SWITCH CIRCUIT

Check sunroof switch circuit. Refer to RF-11, "Description".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-51, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

AUTO OPERATION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000003229889

1. PERFORM INITIALIZATION PROCEDURE

Perform initialization procedure. Refer to RF-5, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement".

Is the inspection result normal?

YES >> Inspection End.
NO >> Check intermittent incident. Refer to GI-51, "Intermittent Incident".

DOES NOT STOP FULLY-OPEN OR FULLY-CLOSED POSITION

Diagnosis Procedure

INFOID:0000000003229890

1. PERFORM INITIALIZATION PROCEDURE

Perform initialization procedure. Refer to RF-5, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement".

Is the inspection result normal?

YES >> Inspection End.
NO >> Check intermittent incident. Refer to GI-51, "Intermittent Incident".

RETAINED POWER OPERATION DOES NOT OPERATE PROPERLY

Diagnosis Procedure

INFOID:0000000003229891

1. CHECK FRONT DOOR SWITCH

Check front door switch. Refer to RF-13, "Component Function Check".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-51, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

SUNROOF DOES NOT OPERATE ANTI-PINCH FUNCTION

Diagnosis Procedure

INFOID:0000000003229892

1. PERFORM INITIALIZATION PROCEDURE

Perform initialization procedure. Refer to RF-5, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement".

Is the inspection result normal?

YES >> Inspection End.
NO >> Check intermittent incident. Refer to GI-51, "Intermittent Incident".

PRECAUTION

PRECAUTIONS

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

INFOID:0000000003229896

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

Precaution

INFOID:0000000003229897

- Disconnect both battery cables in advance.
- Never tamper with or force air bag lid open, as this may adversely affect air bag performance.
- Be careful not to scratch pad and other parts.
- When removing or disassembling any part, be careful not to damage or deform it. Protect parts which may get in the way with cloth.
- When removing parts with a screwdriver or other tool, protect parts by wrapping them with vinyl or tape.
- Keep removed parts protected with cloth.
- If a clip is deformed or damaged, replace it.
- If an unreusable part is removed, replace it with a new one.
- Tighten bolts and nuts firmly to the specified torque.
- After re-assembly has been completed, make sure each part functions correctly.
- Remove stains in the following way.

Water-soluble stains:
Dip a soft cloth in warm water, and then squeeze it tightly. After wiping the stain, wipe with a soft dry cloth.
Oil stain:
Dissolve a synthetic detergent in warm water (density of 2 to 3% or less), dip the cloth, then clean off the stain with the cloth. Next, dip the cloth in fresh water and squeeze it tightly. Then clean off the detergent completely. Then wipe the area with a soft dry cloth.

- Do not use any organic solvent, such as thinner or benzine.

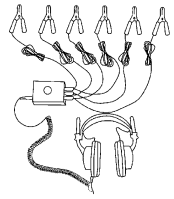
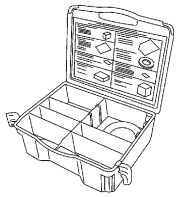
PREPARATION

PREPARATION

Special Service Tool

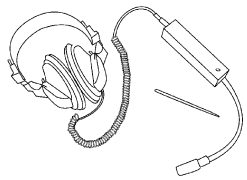
INFOID:0000000003303908

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
— (J-39570) Chassis ear  SIIA0993E	Locating the noise
— (J-43980) NISSAN Squeak and Rattle Kit  SIIA0994E	Repairing the cause of noise

Commercial Service Tool

INFOID:0000000003303909

(Kent-Moore No.) Tool name	Description
(J-39565) Engine ear  SIIA0995E	Locating the noise

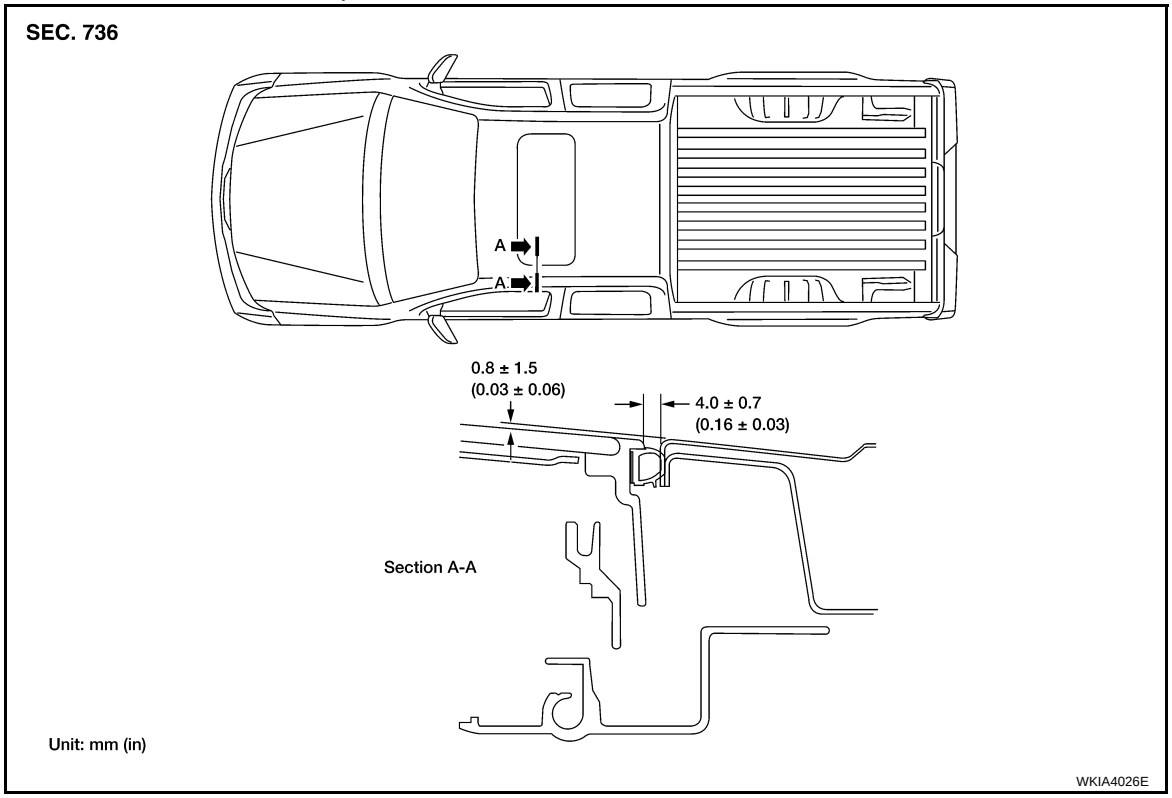
ON-VEHICLE REPAIR

SUNROOF SYSTEM

Adjustment

INFOID:0000000003303910

Inspect then measure the gap and height difference between the glass lid assembly and roof panel; compare to specifications. Determine which procedure to follow based on results of measurements.



GAP ADJUSTMENT

If a gap or minor height difference between glass lid assembly and roof panel is found, adjust in the following manner:

1. Open sunshade assembly and tilt glass lid assembly up.
2. Loosen glass lid assembly screws (2 each on left and right sides), then tilt glass lid assembly down.
3. Manually adjust glass lid assembly from outside of vehicle so it is within specification "A-A" as shown.
4. After adjustment, tilt glass lid assembly up and tighten screws.
5. Tilt glass lid assembly up and down several times to check that it moves and seals properly.

HEIGHT DIFFERENCE ADJUSTMENT

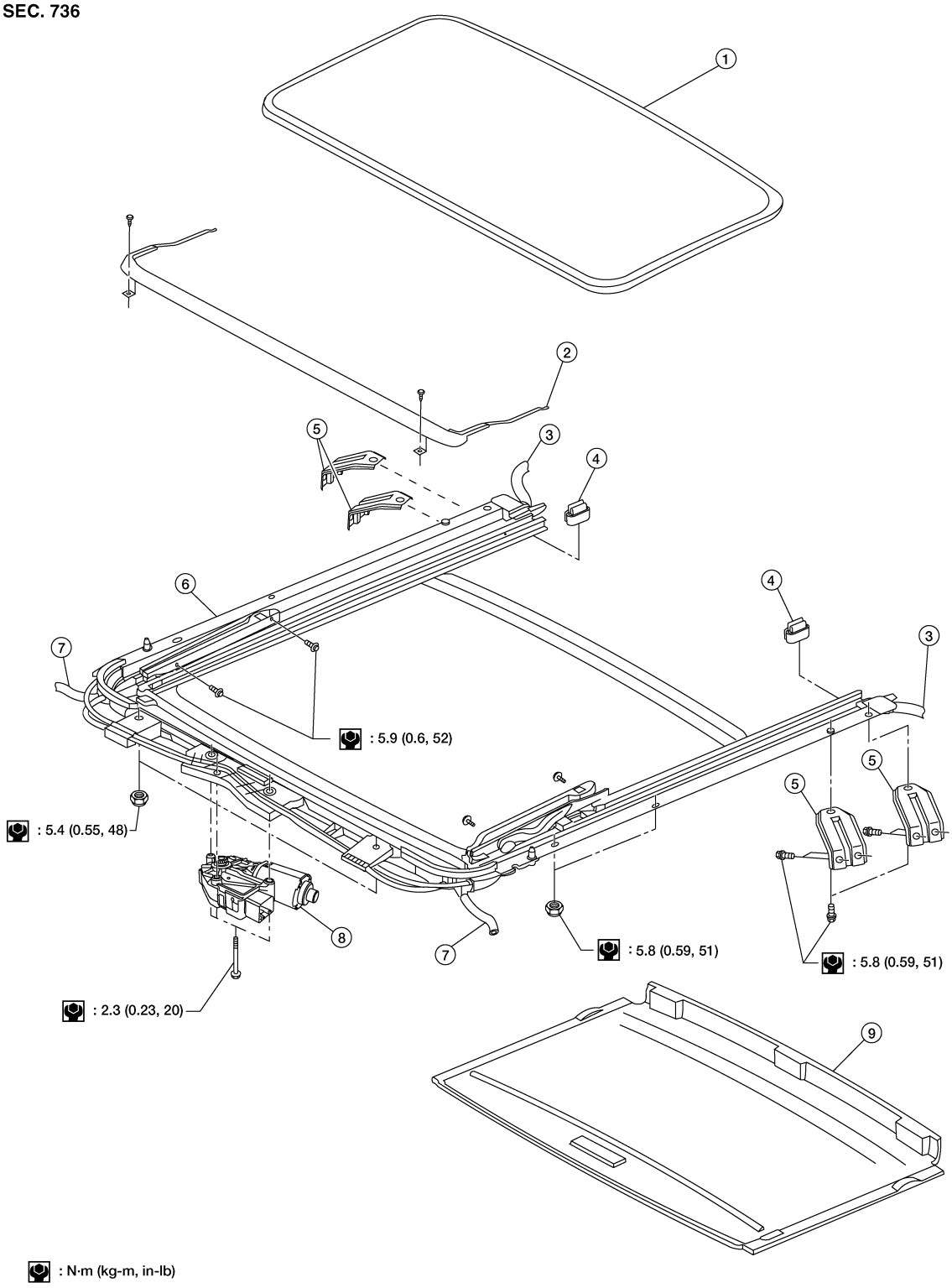
If an excessive height difference between glass lid assembly and roof panel is found, adjust in the following manner:

1. Remove headlining. Refer to INT-23, "Removal and Installation".
2. Loosen sunroof frame assembly nuts and sunroof bracket bolts.
3. Add shims until gap is within specification "A-A" as shown.
   NOTE:
   Temporarily snug nuts and bolts to prevent movement between each adjustment.
4. Tilt glass lid assembly up and down several times to check that it moves and seals properly.
5. Tighten sunroof frame assembly nuts and sunroof bracket bolts.
   NOTE:
   First tighten left front then right rear sunroof frame assembly nuts to prevent uneven torque while tightening remaining sunroof bracket bolts.
6. Install headlining. Refer to INT-23, "Removal and Installation".

Removal and Installation

INFOID:0000000003303911

SEC. 736



WIIA0423E

1. Glass lid assembly
2. Wind deflector
3. Rear drain hoses
4. Shade stoppers
5. Sunroof bracket
6. Sunroof frame assembly
7. Front drain hoses
8. Sunroof motor assembly
9. Sunshade assembly

- After any adjustment, check sunroof operation and glass lid alignment.

- Handle glass lid with care so not to cause damage.
- For easier installation, mark each point before removal.

CAUTION:

- **Always work with a helper.**
- **Before removal, fully close the glass lid assembly. Then, after removal, do not move the motor assembly.**
- **After installing the sunroof and glass lid, check gap adjustment to ensure there is no malfunction.**

SUNROOF UNIT

Removal

CAUTION:

- **Always work with a helper.**
- **When taking sunroof unit out, use shop cloths to protect the seats and trim from damage.**
- **After installing the sunroof unit and glass lid, be sure to check gap adjustment to ensure there is no malfunction.**

1. Remove headlining. Refer to INT-23, "Removal and Installation".
2. Remove the sunroof glass lid.
3. Disconnect sunroof motor and remove the overhead console bracket.
4. Disconnect the drain hoses.
5. Remove front sunroof frame assembly nuts.
6. Remove the rear sunroof bracket bolts.
7. Remove the side bolts and the sunroof unit.

Installation

1. Position the sunroof frame assembly and install the side bolts.
2. Install the rear sunroof bracket bolts.
3. Install front sunroof frame assembly nuts.
4. Connect the drain hoses.
5. Install the overhead console bracket and connect the sunroof motor.
6. Install the sunroof glass lid.
7. Install headlining. Refer to INT-23, "Removal and Installation".

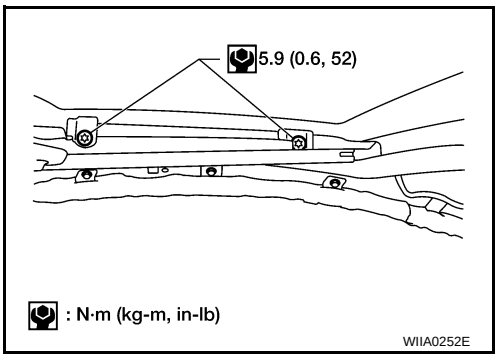
GLASS LID

Removal

1. Open sunshade.
2. Ensure glass lid is closed.
3. Remove the screws securing glass lid to the sunroof frame assembly.
4. Remove the glass lid assembly.

Installation

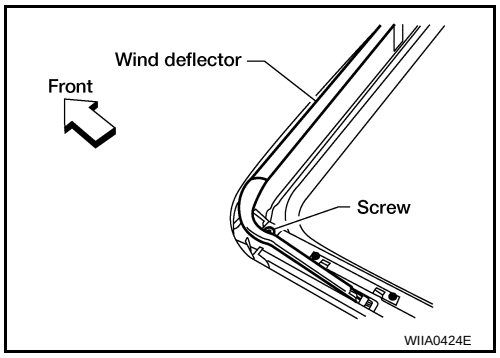
1. Position glass lid to sunroof assembly.
2. Install the glass lid assembly screws. (First tighten left front bolt, then tighten right rear bolt on glass lid to prevent lid from moving while tightening other bolts.)
3. Adjust the sunroof glass. Refer to RF-36, "Adjustment".



WIND DEFLECTOR

Removal

1. Open the sunroof.
2. Remove screws from the left, center, and right side wind deflector holders.
3. Remove the wind deflector from the sunroof frame assembly.

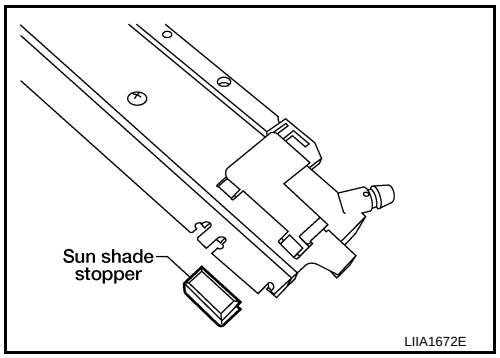


Installation
Installation is in the reverse order of removal.

SUNSHADE

Removal

1. Remove the sunroof frame assembly. Refer to RF-37, "Removal and Installation".
2. Remove the sunshade stoppers (2 points) from the rear end of the sunroof frame assembly.
3. Remove the sunshade assembly from the rear end of the sunroof frame assembly.



Installation
Installation is in the reverse order of removal.

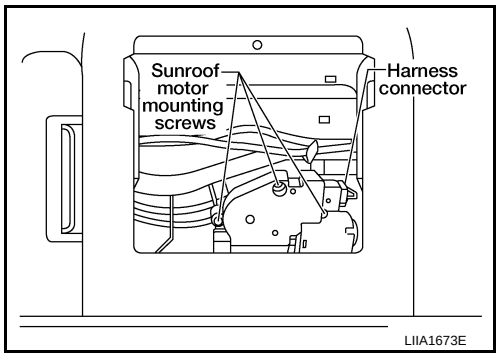
SUNROOF MOTOR

Removal

CAUTION:

- **When removing the sunroof motor, be sure that the sunroof is in the fully closed position.**
- **Never run the removed motor as a single unit.**

1. Position the sunroof assembly in the fully closed position.
2. Remove the front roof console assembly. Refer to INT-23, "Removal and Installation".
3. Disconnect the harness connector from the sunroof motor assembly.
4. Remove the mounting screws and the sunroof motor assembly.

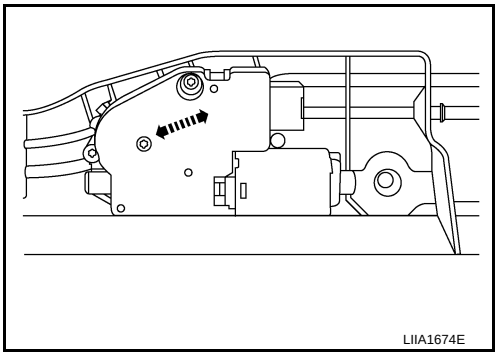


Installation

CAUTION:

Before installing the sunroof motor assembly, be sure to place the link and wire assembly in the symmetrical and fully closed position.

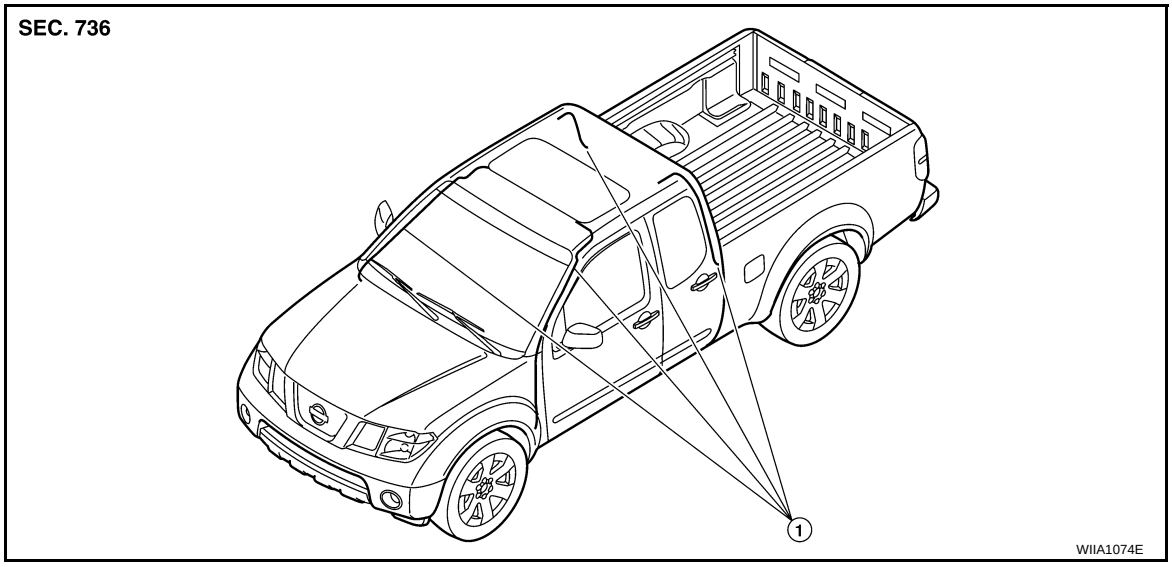
1. Move the sunroof motor assembly laterally little by little so that the gear is completely engaged into the wire on the sunroof unit and the mounting surface becomes parallel. Then secure the motor with bolts.
2. Connect the harness connector to the sunroof motor assembly.



3. Install the front roof console assembly. Refer to INT-23, "Removal and Installation".
4. Reset the sunroof motor memory. Refer to BRC-163, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement".

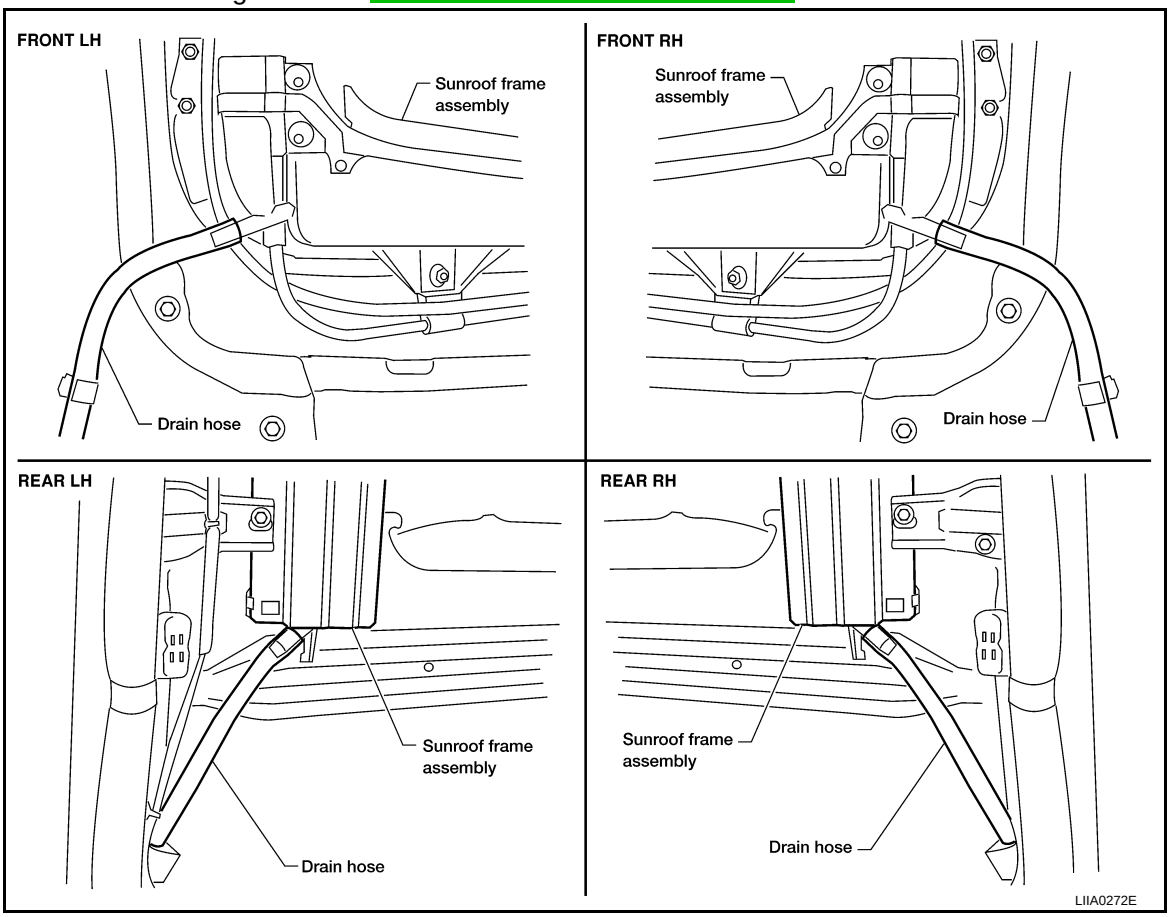
DRAIN HOSES

Removal



1. Drain hose

1. Remove the headlining. Refer to INT-23, "Removal and Installation".



2. Visually check the drain hoses for proper connections, damage or deterioration.
3. Remove each drain hose and check visually for damage, cracks or deterioration.
4. Pour water through the drain hose to check for damage.

- If any damage is found, replace the drain hose.

Installation

Installation is in the reverse order of removal.

WEATHERSTRIP

Visually check weatherstrip for any damage, deterioration, or flattening.

- In the case of leakage around glass lid, close glass lid and pour water around it to find the damaged or gaped portion, remove glass lid assembly. Refer to: RF-37, "Removal and Installation".
- If any damage is found, replace glass lid assembly. Refer to: RF-37, "Removal and Installation".

CAUTION:

Do not remove weatherstrip.

LINK AND WIRE ASSEMBLY

NOTE:

Before replacing any suspect part, be sure it is the source of the noise.

1. Visually check to determine if a sufficient amount of petroleum jelly has been applied to the wire or rail groove. If not, add petroleum jelly as required.
2. Check wire for any damage or deterioration. If any damage is found, remove rear guide, then replace wire.