

SECTION **DEF**  
**DEFOGGER**

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

CONTENTS

<b>PRECAUTION</b> .....	3	<b>DTC/CIRCUIT DIAGNOSIS</b> .....	19
<b>PRECAUTIONS</b> .....	3	<b>REAR WINDOW DEFOGGER SWITCH</b> .....	19
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" .....	3	Component Function Check .....	19
<b>SYSTEM DESCRIPTION</b> .....	4	Diagnosis Procedure .....	19
<b>COMPONENT PARTS</b> .....	4	<b>REAR WINDOW DEFOGGER RELAY</b> .....	20
Component Parts Location .....	4	Component Function Check .....	20
Door mirror defogger .....	5	Diagnosis Procedure .....	20
Rear window defogger .....	5	Component Inspection .....	21
<b>SYSTEM</b> .....	6	<b>REAR WINDOW DEFOGGER</b> .....	22
System Description .....	6	Component Function Check .....	22
Circuit Diagram .....	7	Diagnosis Procedure .....	22
<b>DIAGNOSIS SYSTEM (BCM)</b> .....	8	Component Inspection .....	24
<b>COMMON ITEM</b> .....	8	<b>DOOR MIRROR DEFOGGER</b> .....	25
COMMON ITEM : CONSULT Function (BCM - COMMON ITEM) .....	8	Component Function Check .....	25
<b>REAR WINDOW DEFOGGER</b> .....	9	Diagnosis Procedure .....	25
REAR WINDOW DEFOGGER : CONSULT Function (BCM - REAR DEFOGGER) .....	9	<b>DRIVER SIDE DOOR MIRROR DEFOGGER</b> ...	26
<b>ECU DIAGNOSIS INFORMATION</b> .....	11	Component Function Check .....	26
<b>BCM</b> .....	11	Diagnosis Procedure .....	26
List of ECU Reference .....	11	<b>PASSENGER SIDE DOOR MIRROR DEFOGGER</b> .....	28
<b>WIRING DIAGRAM</b> .....	12	Component Function Check .....	28
<b>REAR WINDOW DEFOGGER SYSTEM</b> .....	12	Diagnosis Procedure .....	28
Wiring Diagram .....	12	<b>SYMPTOM DIAGNOSIS</b> .....	30
<b>BASIC INSPECTION</b> .....	18	<b>REAR WINDOW DEFOGGER AND DOOR MIRROR DEFOGGERS DO NOT OPERATE</b> ...	30
<b>DIAGNOSIS AND REPAIR WORK FLOW</b> .....	18	Diagnosis Procedure .....	30
Work Flow .....	18	<b>REAR WINDOW DEFOGGER DOES NOT OPERATE BUT BOTH DOOR MIRROR DEFOGGERS OPERATE</b> .....	31
		Diagnosis Procedure .....	31

<b>DOOR MIRROR DEFOGGER DOES NOT OPERATE BUT REAR WINDOW DEFOGGER OPERATES</b> .....	32	Diagnosis Procedure .....	33
<b>BOTH SIDES</b> .....	32	<b>REAR WINDOW DEFOGGER INDICATOR DOES NOT ILLUMINATE</b> .....	34
BOTH SIDES : Diagnosis Procedure .....	32	Diagnosis Procedure .....	34
<b>DRIVER SIDE</b> .....	32	<b>REMOVAL AND INSTALLATION</b> .....	35
DRIVER SIDE : Diagnosis Procedure .....	32	<b>FILAMENT</b> .....	35
<b>PASSENGER SIDE</b> .....	32	Inspection and Repair .....	35
PASSENGER SIDE : Diagnosis Procedure .....	32	<b>CONDENSER</b> .....	37
<b>ON IS NOT DISPLAYED WHEN PRESSING REAR WINDOW DEFOGGER SWITCH BUT IT IS OPERATED</b> .....	33	Removal and Installation .....	37

# PRECAUTIONS

< PRECAUTION >

## PRECAUTION

### PRECAUTIONS

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

INFOID:000000009763269

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

#### **WARNING:**

Always observe the following items for preventing accidental activation.

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

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

#### **WARNING:**

Always observe the following items for preventing accidental activation.

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

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

DEF

# COMPONENT PARTS

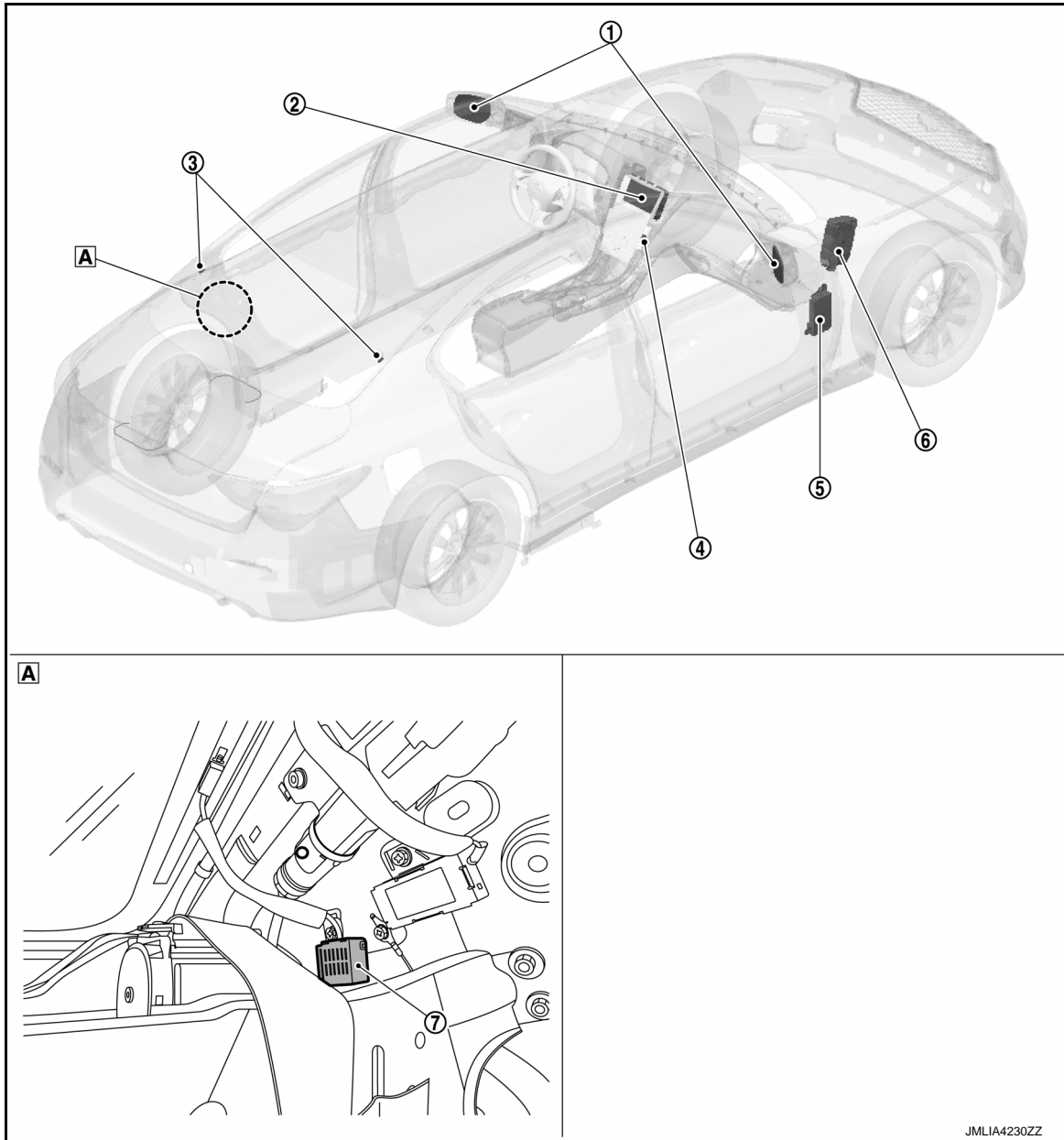
< SYSTEM DESCRIPTION >

## SYSTEM DESCRIPTION

### COMPONENT PARTS

#### Component Parts Location

INFOID:000000009404425



**A** Behind left rear pillar finisher

No.	Component	Function
①	Door mirror defogger	Refer to <a href="#">DEF-5, "Door mirror defogger"</a> .
②	Display control unit	<ul style="list-style-type: none"> <li>• Display control unit transmits rear window defogger switch signal to BCM via CAN communication.</li> <li>• Display control unit transmits rear window defogger feedback signal to integral switch. Refer to <a href="#">AV-14, "Component Parts Location"</a> for detailed installation location.</li> </ul>
③	Rear window defogger	Refer to <a href="#">DEF-5, "Rear window defogger"</a> .

# COMPONENT PARTS

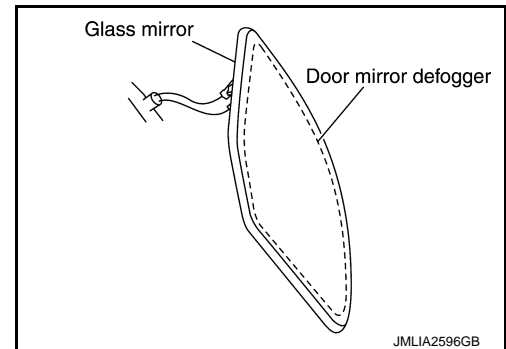
## < SYSTEM DESCRIPTION >

No.	Component	Function
④	Integral switch (Rear window defogger switch)	<ul style="list-style-type: none"> <li>Rear window defogger switch is installed.</li> <li>Turns the indicator lamp ON when detecting the operation of rear window defogger</li> </ul> Refer to <a href="#">AV-14, "Component Parts Location"</a> for detailed installation location.
⑤	BCM	<ul style="list-style-type: none"> <li>Receives rear window defogger switch signal.</li> <li>Performs the timer control of rear window defogger.</li> </ul> Refer to <a href="#">BCS-4, "BODY CONTROL SYSTEM : Component Parts Location"</a> .
⑥	IPDM E/R	Transmits rear window defogger control signal to display control unit via CAN communication Refer to <a href="#">PCS-4, "Component Parts Location"</a> .
⑦	Condenser	Reduce the noise of rear window defogger operation.

### Door mirror defogger

INFOID:000000009404426

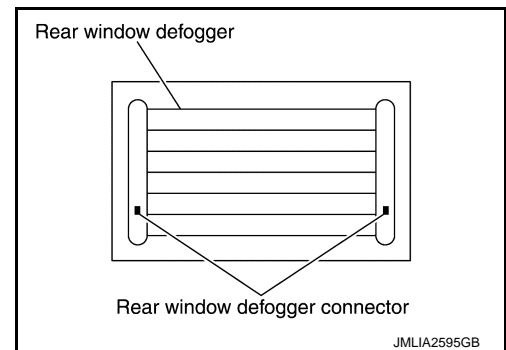
Heats the heating wire with the power supply from the rear window defogger relay to prevent the door mirror from fogging up.



### Rear window defogger

INFOID:000000009404427

Heats the heating wire with the power supply from the rear window defogger relay to prevent the rear window from fogging up.



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

# SYSTEM

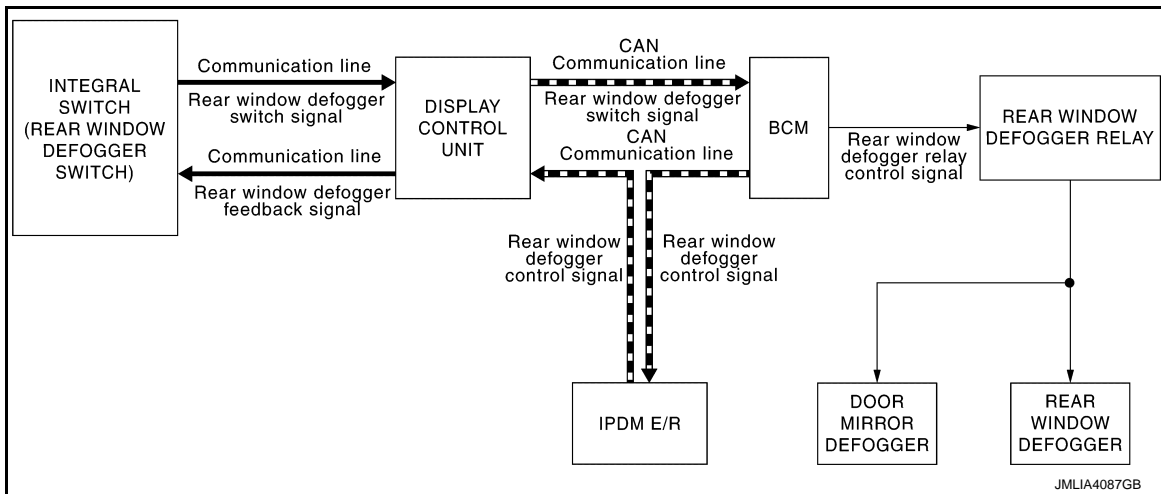
< SYSTEM DESCRIPTION >

## SYSTEM

### System Description

INFOID:000000009238942

### SYSTEM DIAGRAM



### OPERATION DESCRIPTION

- Turn rear window defogger switch ON when the ignition switch turns ON. Then integral switch (rear window defogger switch) transmits rear window defogger switch signal to display control unit. Then display control unit transmits rear window defogger switch signal to BCM via CAN communication.
- BCM turns rear window defogger relay ON and transmits rear window defogger control signal to IPDM E/R via CAN communication when rear window defogger switch signal is received.
- Rear window defogger and door mirror defogger are supplied with power and operate when rear window defogger relay turns ON.
- IPDM E/R transmits rear window defogger control signal to display control unit via CAN communication.
- Display control unit transmit rear defogger feedback signal to integral switch (rear window defogger switch) via communication, then rear window defogger indicator is illuminated.

### TIMER FUNCTION

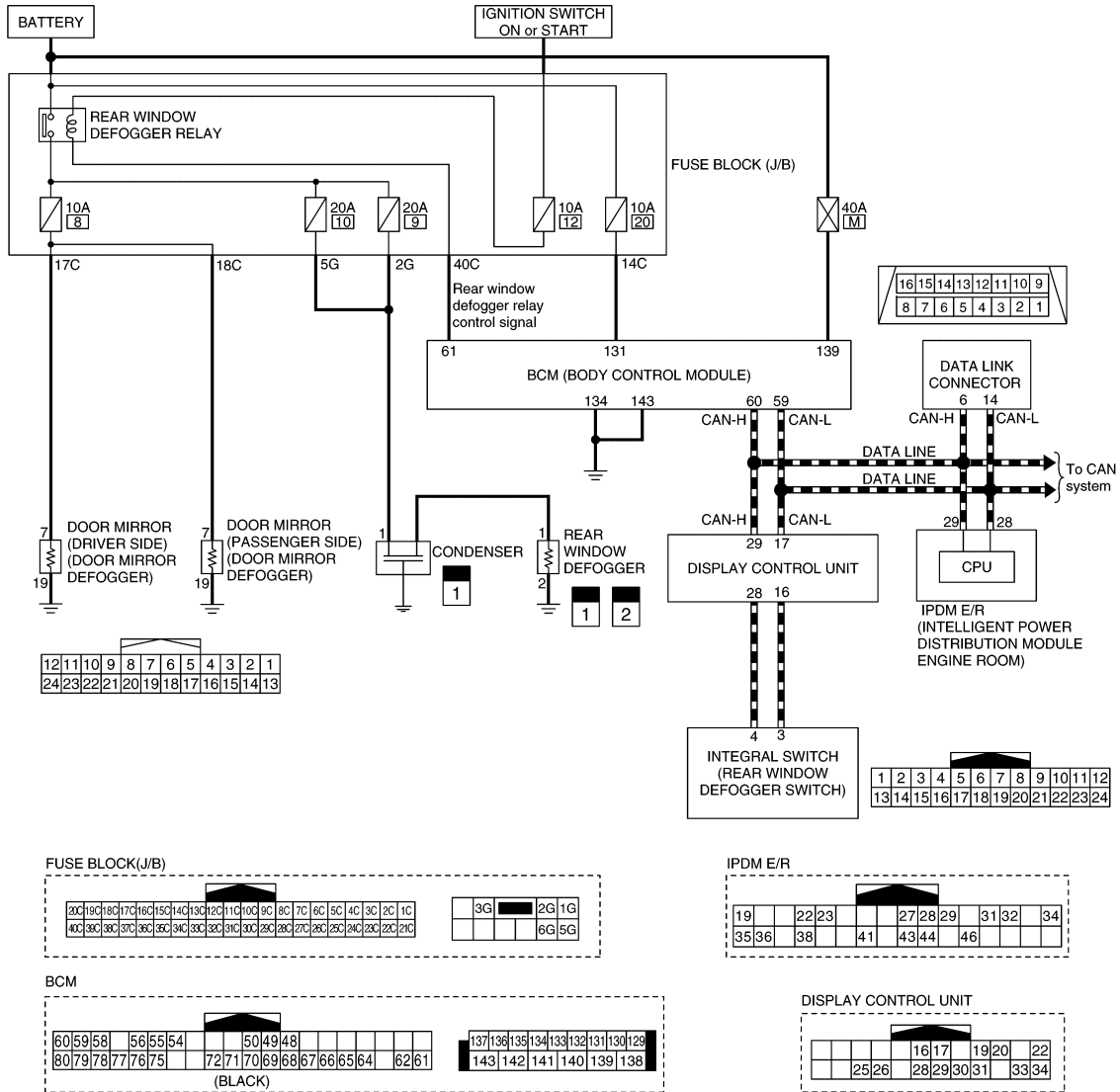
- BCM turns rear window defogger relay ON for approximately 15 minutes when rear window defogger switch turns ON. It makes rear window defogger and door mirror defogger operate.
- Timer is canceled after pressing rear window defogger switch again during timer operation. Then BCM turns rear window defogger relay OFF. The same reaction also occurs during timer operation, if the ignition switch is turned OFF.

# SYSTEM

< SYSTEM DESCRIPTION >

## Circuit Diagram

INFOID:000000009670898



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

# DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

## DIAGNOSIS SYSTEM (BCM)

### COMMON ITEM

#### COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:000000009403896

#### APPLICATION ITEM

CONSULT performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	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	<ul style="list-style-type: none"> <li>Read and save the vehicle specification.</li> <li>Write the vehicle specification when replacing BCM.</li> </ul>

#### SYSTEM APPLICATION

BCM can perform the following functions for each system.

#### NOTE:

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER	×	×	×
Warning chime	BUZZER		×	×
Interior room lamp timer	INT LAMP	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER	×	×	×
—	AIR CONDITONER*		×	×
<ul style="list-style-type: none"> <li>Intelligent Key system</li> <li>Engine start system</li> </ul>	INTELLIGENT KEY	×	×	×
Combination switch	COMB SW		×	
Body control system	BCM	×		
IVIS - NATS	IMMU	×	×	×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Trunk lid open	TRUNK		×	
Vehicle security system	THEFT ALM	×	×	×
RAP system	RETAINED PWR		×	
Signal buffer system	SIGNAL BUFFER		×	×
TPMS	AIR PRESSURE MONITOR			×

\*: This item is not used.

#### FREEZE FRAME DATA (FFD)

The BCM records the following vehicle condition at the time a particular DTC is detected, and displays on CONSULT.



# DIAGNOSIS SYSTEM (BCM)

## < SYSTEM DESCRIPTION >

CONSULT screen item	Indication/Unit	Description		
Vehicle Speed	km/h	Vehicle speed of the moment a particular DTC is detected		A
Odo/Trip Meter	km	Total mileage (Odometer value) of the moment a particular DTC is detected		B
Vehicle Condition	SLEEP>LOCK	Power position status of the moment a particular DTC is detected*	While turning BCM status from low power consumption mode to normal mode (Power supply position is "LOCK"*)	B
	SLEEP>OFF		While turning BCM status from low power consumption mode to normal mode (Power supply position is "OFF".)	C
	LOCK>ACC		While turning power supply position from "LOCK" *to "ACC"	D
	ACC>ON		While turning power supply position from "ACC" to "IGN"	D
	RUN>ACC		While turning power supply position from "RUN" to "ACC" (Vehicle is stopping and selector lever is except P position.)	E
	CRANK>RUN		While turning power supply position from "CRANKING" to "RUN" (From cranking up the engine to run it)	E
	RUN>URGENT		While turning power supply position from "RUN" to "ACC" (Emergency stop operation)	F
	ACC>OFF		While turning power supply position from "ACC" to "OFF"	F
	OFF>LOCK		While turning power supply position from "OFF" to "LOCK"*	G
	OFF>ACC		While turning power supply position from "OFF" to "ACC"	G
	ON>CRANK		While turning power supply position from "IGN" to "CRANKING"	H
	OFF>SLEEP		While turning BCM status from normal mode (Power supply position is "OFF".) to low power consumption mode	H
	LOCK>SLEEP		While turning BCM status from normal mode (Power supply position is "LOCK"*. ) to low power consumption mode	I
	LOCK		Power supply position is "LOCK" (Ignition switch OFF)*	I
	OFF		Power supply position is "OFF" (Ignition switch OFF)	J
	ACC		Power supply position is "ACC" (Ignition switch ACC)	J
	ON		Power supply position is "IGN" (Ignition switch ON with engine stopped)	K
	ENGINE RUN		Power supply position is "RUN" (Ignition switch ON with engine running)	K
CRANKING	Power supply position is "CRANKING" (At engine cranking)	K		
IGN Counter	0 - 39	The number of times that ignition switch is turned ON after DTC is detected <ul style="list-style-type: none"> <li>• The number is 0 when a malfunction is detected now.</li> <li>• The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition switch OFF → ON.</li> <li>• The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.</li> </ul>		DEF

### NOTE:

\*: Power supply position shifts to "LOCK" from "OFF", when ignition switch is in the OFF position, selector lever is in the P position, and any of the following conditions are met.

- Closing door
- Opening door
- Door is locked using door request switch
- Door is locked using Intelligent Key

The power supply position shifts to "ACC" when the push-button ignition switch (push switch) is pushed at "LOCK".

## REAR WINDOW DEFOGGER

### REAR WINDOW DEFOGGER : CONSULT Function (BCM - REAR DEFOGGER)

INFOID:000000009403941

## WORK SUPPORT

# DIAGNOSIS SYSTEM (BCM)

## < SYSTEM DESCRIPTION >

Service item	Setting item	Description
SET R-DEF TIMER	MODE1*	<b>NOTE:</b> Do not use this function.
	MODE2	
	MODE3	

\*: Factory setting

## DATA MONITOR

### **NOTE:**

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

Monitor Item	Description
PUSH SW	Indicates [On/Off] condition of push switch
REAR DEF SW	Displays "Press (On)/other (Off)" status determined with the rear window defogger switch

## ACTIVE TEST

Test Item	Description
REAR DEFOGGER	Rear window defogger operates when "On" on CONSULT screen is touched

# BCM

< ECU DIAGNOSIS INFORMATION >

## ECU DIAGNOSIS INFORMATION

BCM

List of ECU Reference

INFOID:000000009238945

ECU	Reference
BCM	<a href="#">BCS-35. "Reference Value"</a>
	<a href="#">BCS-60. "Fail-safe"</a>
	<a href="#">BCS-61. "DTC Inspection Priority Chart"</a>
	<a href="#">BCS-62. "DTC Index"</a>

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

DEF

# REAR WINDOW DEFOGGER SYSTEM

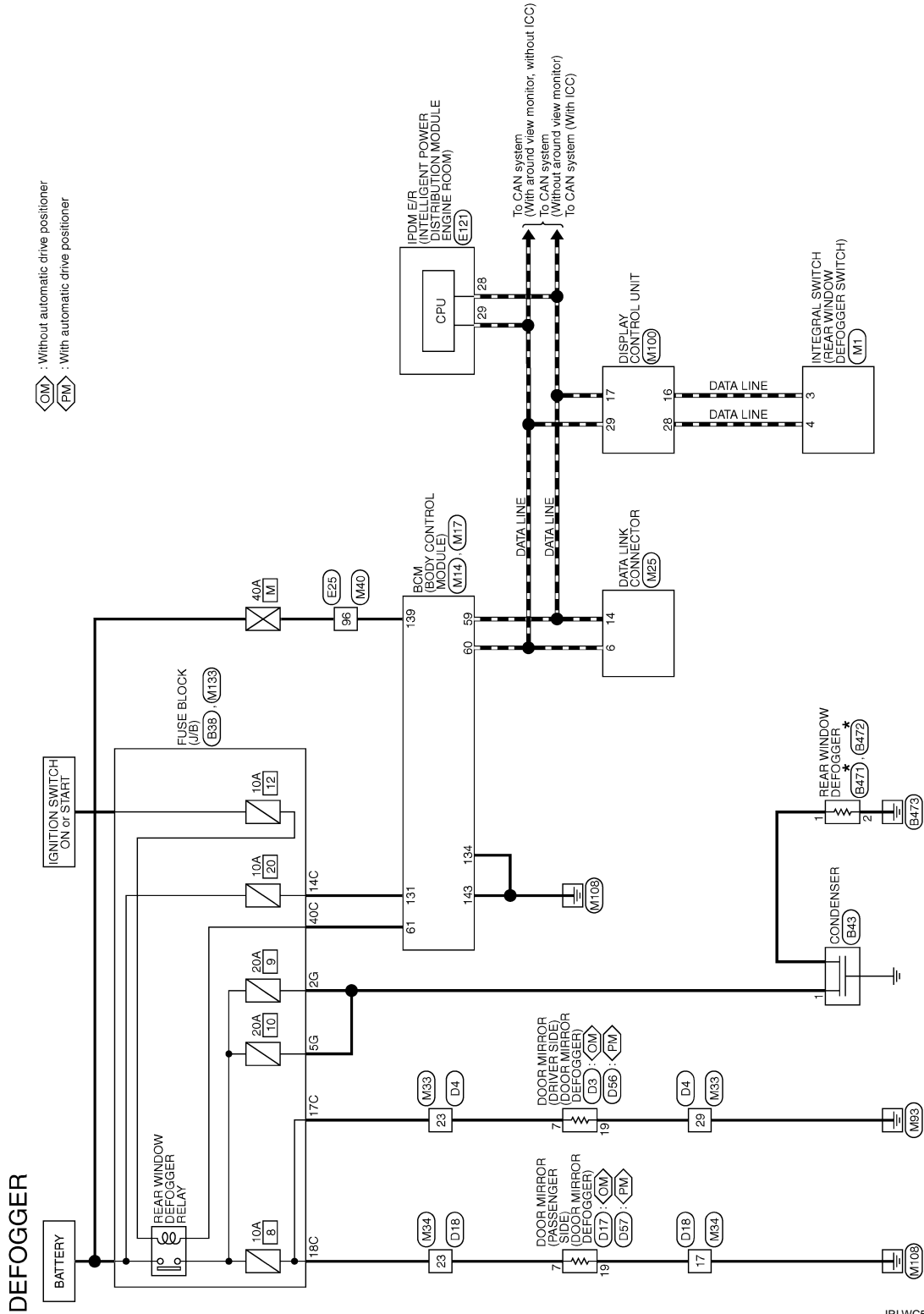
< WIRING DIAGRAM >

## WIRING DIAGRAM

### REAR WINDOW DEFOGGER SYSTEM

#### Wiring Diagram

INFOID:000000009238946

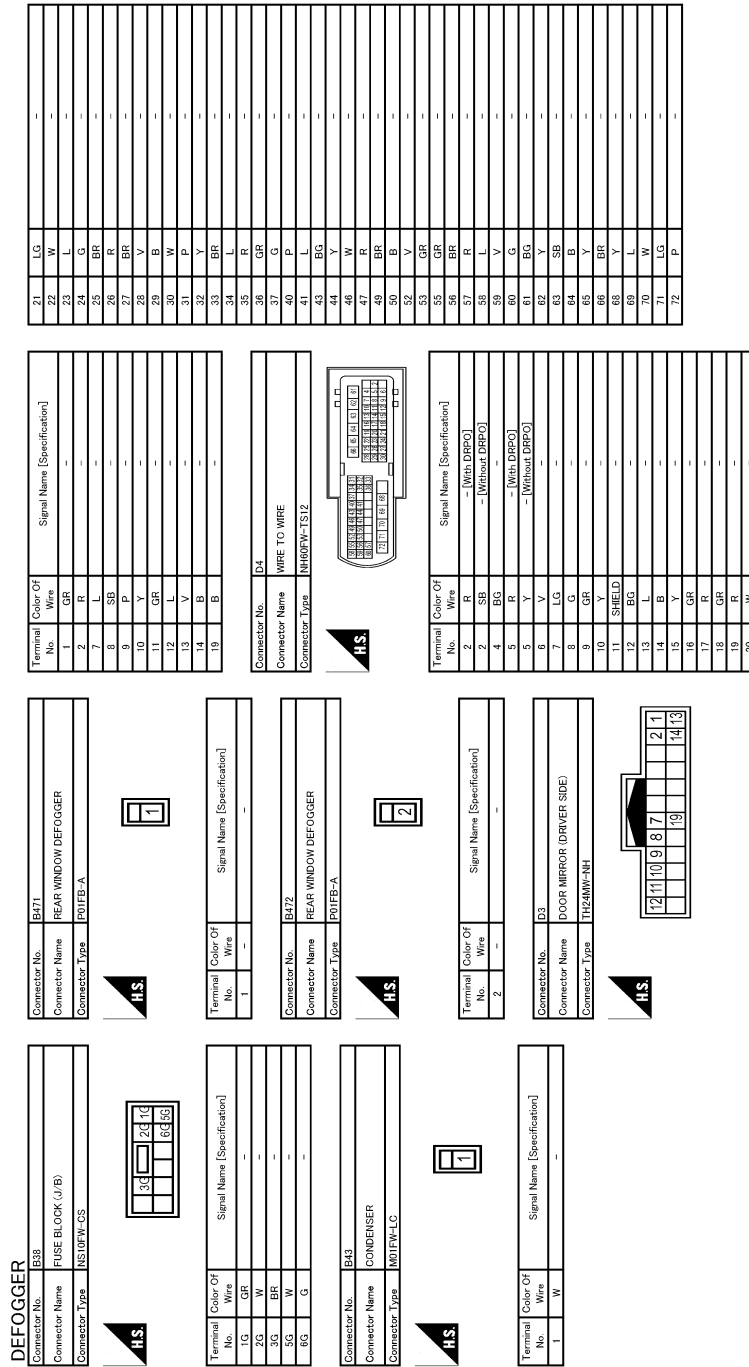


2013/05/17

JRLWC5171GB

# REAR WINDOW DEFOGGER SYSTEM

< WIRING DIAGRAM >

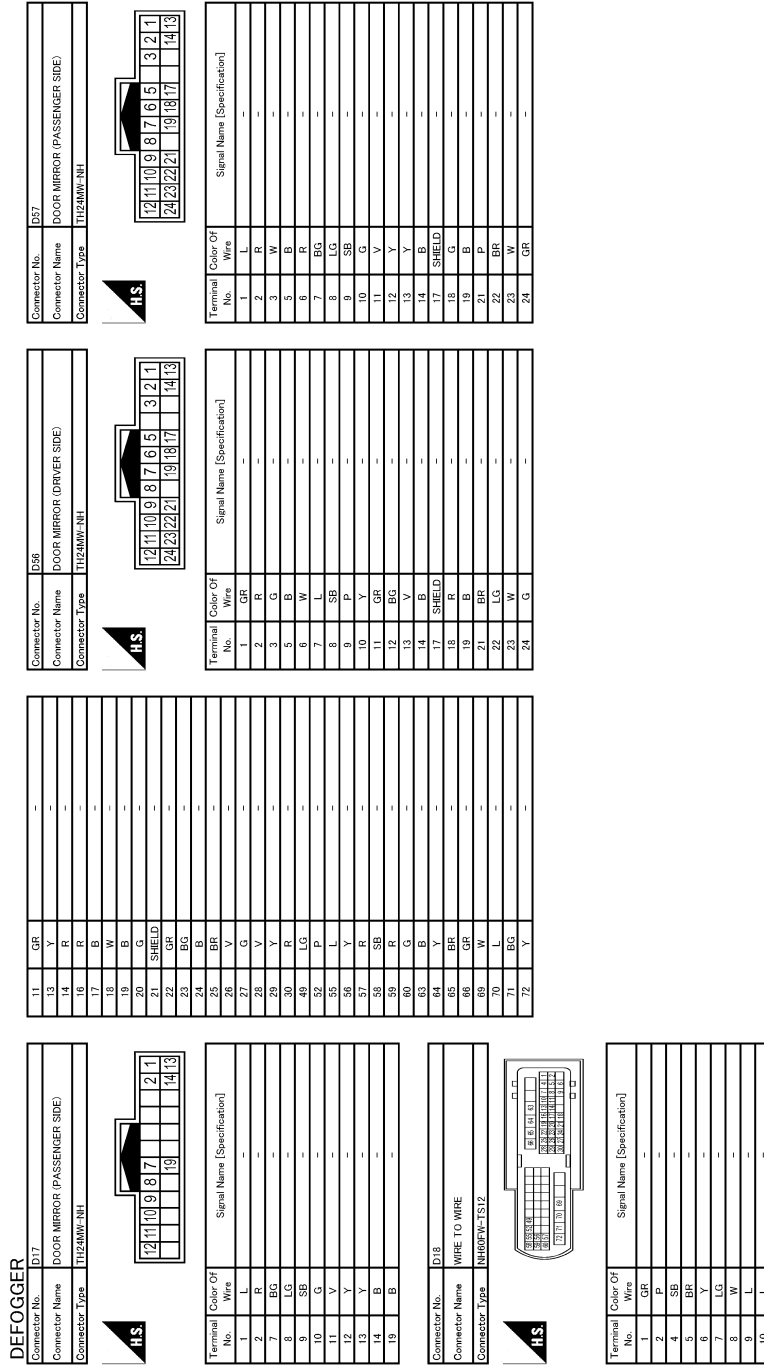


JRLWC5172GB

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

# REAR WINDOW DEFOGGER SYSTEM

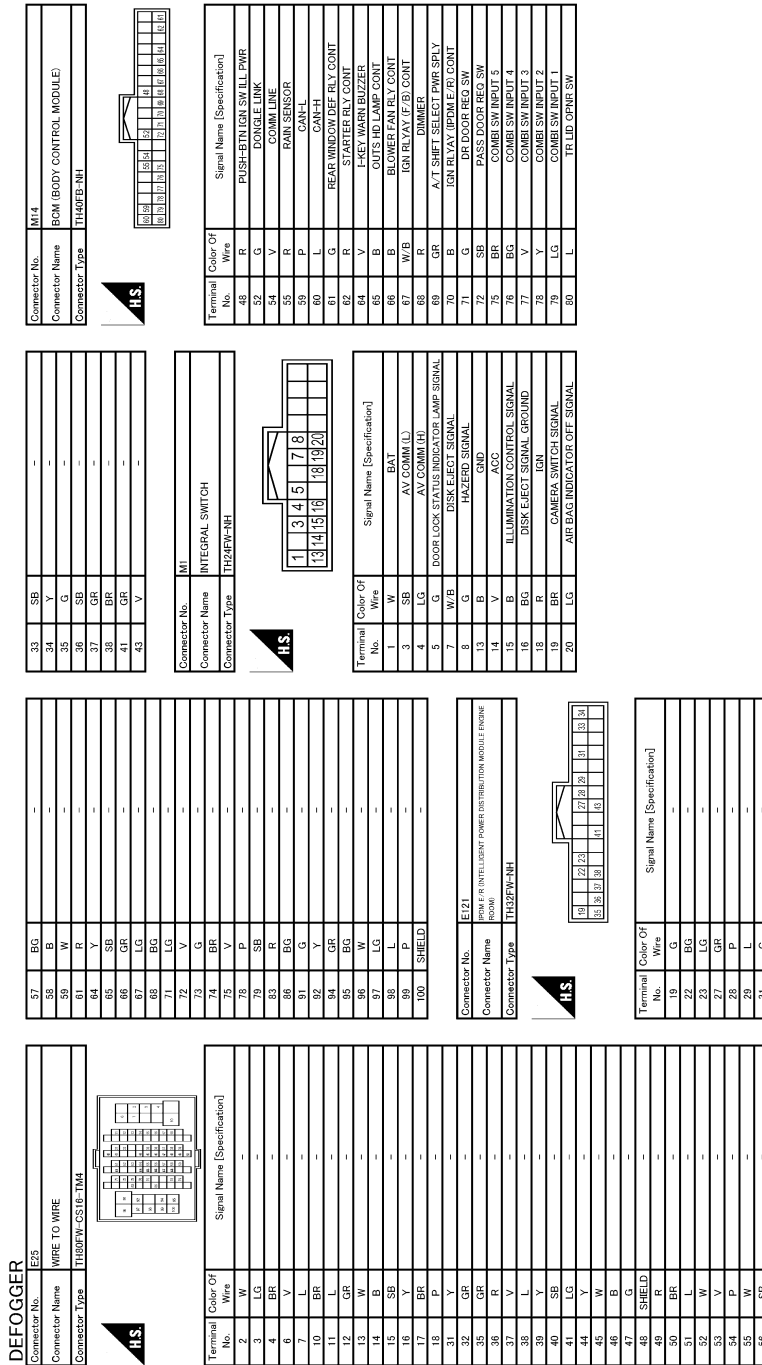
< WIRING DIAGRAM >



JRLWC5173GB

# REAR WINDOW DEFOGGER SYSTEM

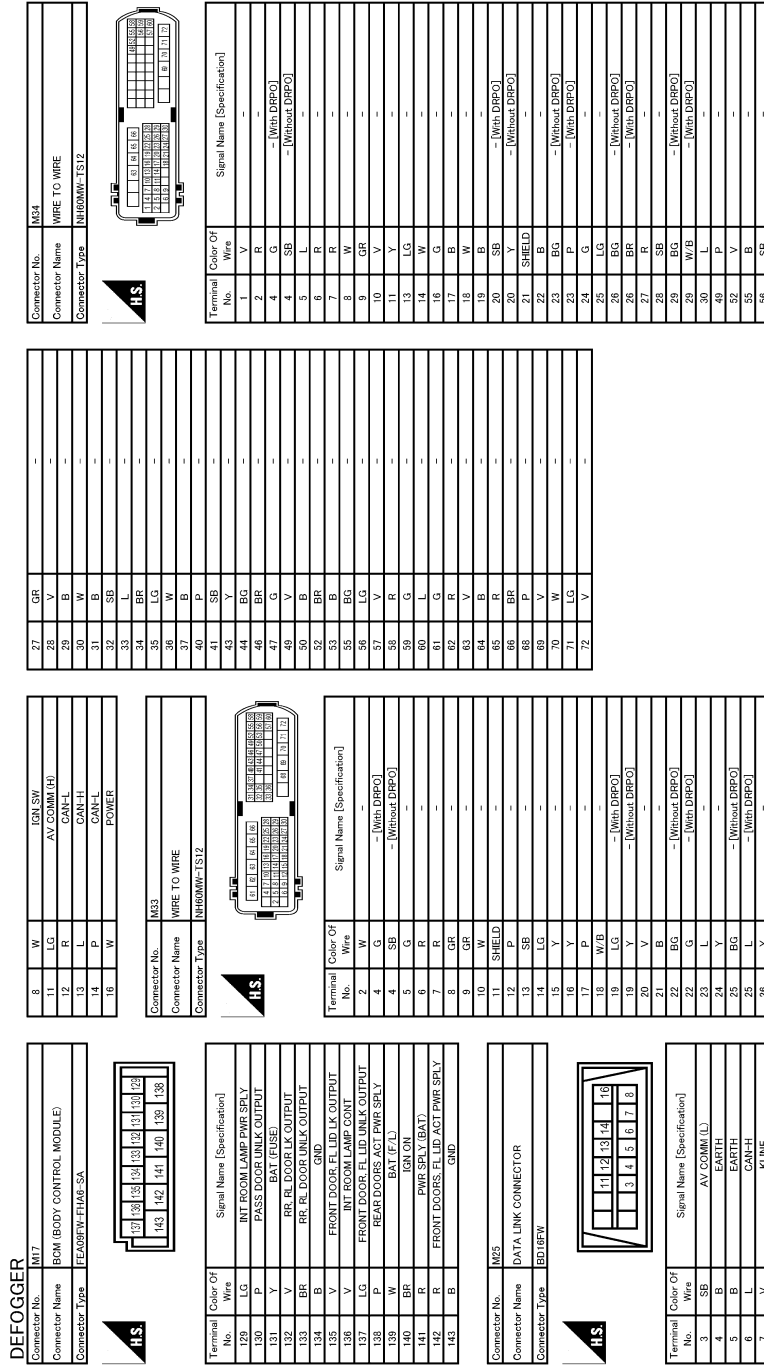
< WIRING DIAGRAM >



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

# REAR WINDOW DEFOGGER SYSTEM

< WIRING DIAGRAM >



JRLWC5175GB



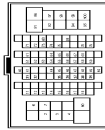
# REAR WINDOW DEFOGGER SYSTEM

< WIRING DIAGRAM >

## DEFOGGER

37	G	-
38	G	-
39	LG	-
40	G	-
41	GR	-
42	W	-
43	GR	-
44	W	-
45	GR	-
46	W	-
47	R	-
48	SHIELD	-
49	B	-
50	BR	-
51	L	-
52	W	-
53	G	-
54	Y	-
55	P	-
56	BG	-
57	GR	-
58	SB	-
59	SB	-
60	W/B	-
61	W/B	-
62	Y	-
63	R	-
64	R	-
65	BR	-
66	Y	-
67	LG	-
68	BG	-
69	BR	-
70	Y	-
71	SB	-
72	W	-

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Type	TH80MM-C51P-TM4



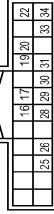
**HS**

Terminal No.	Color	Wire	Signal Name [Specification]
1	GR	-	-
2	GR	-	-
3	Y	-	-
4	Y	-	-
5	W/B	-	-
6	W/B	-	-
7	V	-	-
10	W	-	-
11	W	-	-
12	B	-	-
13	GR	-	-
14	B	-	-
15	SB	-	-
16	B	-	-
17	LG	-	-
18	B	-	-
19	W	-	-
20	Y	-	-
21	Y	-	-
22	BG	-	-
23	CG	-	-
24	B	-	-
25	L	-	-
26	Y	-	-
27	GR	-	-

41	L	-
42	BR	-
43	W	-
44	G	-
45	R	-
46	SHIELD	-
47	B	-
48	B	-
49	BR	-
50	BR	-
51	L	-
52	W	-
53	G	-
54	Y	-
55	P	-
56	BG	-
57	GR	-
58	SB	-
59	SB	-
60	W/B	-
61	W/B	-
62	Y	-
63	R	-
64	R	-
65	SB	-
66	V	-
67	LG	-
68	BG	-
69	L	-
70	V	-
71	V	-
72	LG	-
73	R	-
74	BR	-
75	B	-
76	G	-
77	Y	-
78	R	-
79	V	-
80	V	-
81	W	-
82	R	-
83	BG	-
84	BR	-
85	W	-
86	W	-
87	LG	-
88	BG	-
89	W	-
90	W	-
91	W	-
92	R	-
93	R	-
94	BG	-
95	BR	-
96	W	-
97	LG	-
98	Y	-
99	BR	-
100	SHIELD	-

Connector No.	M100
Connector Name	DISPLAY CONTROL UNIT
Connector Type	TH84PW-NH

**HS**



Terminal No.	Color	Wire	Signal Name [Specification]
15	SB	-	AV COMM (L)
16	P	-	AV COMM (H)
17	P	-	DIMMER SIGNAL
18	BR	-	REVERSE SIGNAL
19	BR	-	REVERSE SIGNAL
20	BR	-	REVERSE SIGNAL
21	B	-	GRD
22	B	-	GRD
23	SB	-	-
24	SB	-	-
25	SB	-	-
26	BR	-	CAMERA SWITCH SIGNAL
27	LG	-	AV COMM (H)
28	LG	-	AV COMM (H)
29	L	-	CAN-H
30	L	-	CAN-H
31	R	-	ION
32	R	-	VEHICLE SPEED SIGNAL (9-PULSE)
33	SB	-	ACC
34	Y	-	BAT

Connector No.	M133
Connector Name	FUSE BLOCK (J/B)
Connector Type	TH84PW-NH

**HS**



Terminal No.	Color	Wire	Signal Name [Specification]
100	Y	-	-
101	Y	-	-
102	Y	-	-
103	L	-	-
104	Y	-	-
105	R	-	-
106	R	-	-
107	L	-	-

15C	BG	-	[Without DRPO]
16C	P	-	[With DRPO]
17C	B	-	-
18C	W	-	-
19C	W	-	-
20C	W	-	-
21C	W	-	-
22C	L	-	-
23C	L	-	-
24C	LG	-	-
25C	SB	-	-
26C	P	-	-
27C	W	-	-
28C	W	-	-
29C	W	-	-
30C	R	-	-
31C	R	-	-
32C	W	-	-
33C	R	-	-
34C	W/B	-	-
35C	SB	-	-
36C	R	-	-
37C	W	-	-
38C	SB	-	-
39C	V	-	-
40C	P	-	-
41C	G	-	-
42C	P	-	-
43C	P	-	-
44C	G	-	-
45C	G	-	-
46C	G	-	-
47C	G	-	-
48C	V	-	-

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

# DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORK FLOW

#### Work Flow

INFOID:000000009238947

#### DETAILED FLOW

#### 1.OBTAIN INFORMATION ABOUT SYMPTOM

Interview the customer to obtain the malfunction information (conditions and environment when the malfunction occurred) as much as possible when the customer brings the vehicle in.

>> GO TO 2.

#### 2.CHECK DTC

Perform self diagnosis with CONSULT

Is any DTC detected?

YES >> Refer to [BCS-62, "DTC Index"](#).

NO >> GO TO 3.

#### 3.REPRODUCE THE MALFUNCTION INFORMATION

Check the malfunction on the vehicle that the customer describes.

Inspect the relation of the symptoms and the condition when the symptoms occur.

>> GO TO 4.

#### 4.IDENTIFY THE MALFUNCTIONING SYSTEM WITH "SYMPTOM DIAGNOSIS"

Use "Symptom diagnosis" from the symptom inspection result in step 3. Then identify where to start performing the diagnosis based on possible causes and symptoms.

>> GO TO 5.

#### 5.IDENTIFY MALFUNCTIONING PARTS WITH "COMPONENT DIAGNOSIS"

Perform the diagnosis with "Component diagnosis" of the applicable system.

>> GO TO 6.

#### 6.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 7.

#### 7.FINAL CHECK

Check that malfunctions are not reproduced when obtaining the malfunction information from the customer, referring to the symptom inspection result in step 3.

Are all malfunctions corrected?

YES >> INSPECTION END

NO >> GO TO 4.

# REAR WINDOW DEFOGGER SWITCH

< DTC/CIRCUIT DIAGNOSIS >

## DTC/CIRCUIT DIAGNOSIS

### REAR WINDOW DEFOGGER SWITCH

#### Component Function Check

INFOID:000000009238948

#### 1.CHECK REAR WINDOW DEFOGGER SWITCH FUNCTION

Check that the indicator lamp of rear window defogger illuminates when rear window defogger switch ON.

Is the inspection result normal?

- YES >> Rear window defogger switch function is OK.
- NO >> Refer to [DEF-19. "Diagnosis Procedure"](#)

#### Diagnosis Procedure

INFOID:000000009238949

#### 1.CHECK INTEGRAL SWITCH (REAR WINDOW DEFOGGER SWITCH)

Does integral switch operate normally?

Refer to [AV-267. "Symptom Table"](#).

Is the inspection result normal?

- YES >> INSPECTION END.
- NO >> Replace integral switch (rear window defogger switch).

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

DEF

# REAR WINDOW DEFOGGER RELAY

< DTC/CIRCUIT DIAGNOSIS >

## REAR WINDOW DEFOGGER RELAY

### Component Function Check

INFOID:000000009238950

#### 1.CHECK REAR WINDOW DEFOGGER RELAY POWER SUPPLY CIRCUIT

1. Perform Active Test ("REAR DEFOGGER") with CONSULT.
2. Touch "ON".
3. Check that the rear window heating wire is getting warmer.

Is the inspection result normal?

- YES >> Rear window defogger relay power supply circuit is OK.  
 NO >> Refer to [DEF-20. "Diagnosis Procedure"](#)

### Diagnosis Procedure

INFOID:000000009238951

#### 1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse [No.12, located in fuse block (J/B)].

Is the inspection result normal?

- YES >> GO TO 2.  
 NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

#### 2.CHECK REAR WINDOW DEFOGGER CIRCUIT 1

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

(+)		(-)	Condition	Voltage (V)	
BCM					
Connector	Terminal				
M14	61	Ground	Rear window defogger switch	ON	0 – 1
			OFF	9 – 16	

Is the inspection result normal?

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

#### 3.CHECK REAR WINDOW DEFOGGER CIRCUIT 2

1. Turn ignition switch OFF.
2. Disconnect BCM connector and rear window defogger relay.
3. Check continuity between BCM harness connector and fuse block (J/B) harness connector.

BCM		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M14	61	M133	40C	Existed

Is the inspection result normal?

- YES >> GO TO 4.  
 NO >> Repair or replace harness.

#### 4.CHECK REAR WINDOW DEFOGGER RELAY

Check rear window defogger relay.  
 Refer to [DEF-21. "Component Inspection"](#)

Is the inspection result normal?

- YES >> GO TO 5.  
 NO >> Replace rear window defogger relay.

#### 5.CHECK FUSE BLOCK (J/B)

1. Install the rear window defogger relay.

# REAR WINDOW DEFOGGER RELAY

## < DTC/CIRCUIT DIAGNOSIS >

2. Turn ignition switch ON.
3. Check voltage between fuse block (J/B) (fuse block side) and ground.

(+)		(-)	Voltage (V) (Approx.)
Fuse block (J/B)			
Connector	Terminal	Ground	Battery voltage
M133	40C		

Is the inspection result normal?

- YES >> GO TO 6.  
 NO >> Repair or replace fuse block (J/B).

## 6.CHECK INTERMITTENT INCIDENT

Check intermittent incident.  
 Refer to [GI-43, "Intermittent Incident"](#).

>> INSPECTION END.

## Component Inspection

INFOID:000000009238952

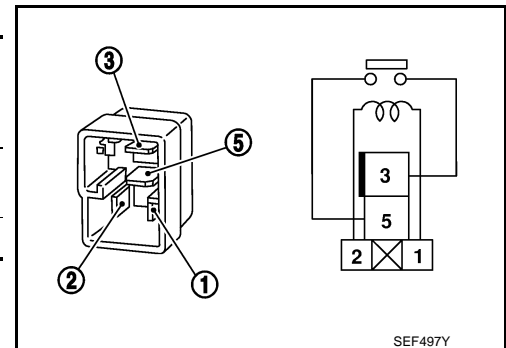
## 1.CHECK REAR WINDOW DEFOGGER RELAY

1. Turn ignition switch OFF.
2. Disconnect rear window defogger relay.
3. Check continuity between rear window defogger relay terminals.

Terminal		Condition	Continuity
Rear window defogger relay			
3	5	12 V direct current supply between terminals 1 and 2.	Existed
		No current supply	Not existed

Is the inspection result normal?

- YES >> INSPECTION END.  
 NO >> Replace rear window defogger relay.



SEF497Y

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

DEF

# REAR WINDOW DEFOGGER

< DTC/CIRCUIT DIAGNOSIS >

## REAR WINDOW DEFOGGER

### Component Function Check

INFOID:000000009238953

#### 1.CHECK REAR WINDOW DEFOGGER

1. Perform Active Test ("REAR DEFOGGER") with CONSULT.
2. Touch "ON".
3. Check that the rear window heating wire is getting warmer.

Is the inspection result normal?

- YES >> Rear window defogger is OK.  
NO >> Refer to [DEF-22. "Diagnosis Procedure"](#)

#### Diagnosis Procedure

INFOID:000000009238954

#### 1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check that the following fuse is not fusing.

Fuse No.	Capacity
9	20 A
10	

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

#### 2.CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between rear window defogger harness connector and ground.

(+)		(-)	Condition	Voltage (V) (Approx.)	
Connector	Terminal				
B471	1	Ground	Rear window defogger switch	ON	Battery voltage
			OFF	0	

Is the inspection result normal?

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

#### 3.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Check continuity between rear window defogger harness connector and ground.

Rear window defogger		Ground	Continuity
Connector	Terminal		
B472	2		Existed

Is the inspection result normal?

- YES >> GO TO 8.  
NO >> Repair or replace harness.

#### 4.CHECK REAR WINDOW DEFOGGER CIRCUIT 1

1. Turn ignition switch OFF.
2. Disconnect condenser connector and rear window defogger connector.

# REAR WINDOW DEFOGGER

## < DTC/CIRCUIT DIAGNOSIS >

3. Check continuity between condenser and rear window defogger harness connector.

Condenser		Rear window defogger		Continuity
Terminal	Connector	Terminal	Connector	
1	B471	1		Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or condenser.

## 5.CHECK REAR WINDOW DEFOGGER CIRCUIT 2

1. Disconnect fuse block (J/B) connector.
2. Check continuity between fuse block (J/B) harness connector and condenser harness connector.

Fuse block (J/B)		Condenser		Continuity
Connector	Terminal	Connector	Terminal	
B38	2G	B43	1	Existed
	5G			

3. Check continuity between fuse block (J/B) connector and ground.

Fuse block (J/B)		Ground	Continuity
Connector	Terminal		
B38	2G		Existed
	5G		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness.

## 6.CHECK FUSE BLOCK (J/B)

1. Turn ignition switch ON.
2. Check voltage between fuse block (J/B) (fuse block side) and ground.

(+)	(-)	Condition	Voltage (V) (Approx.)	
Fuse block (J/B) Terminal				
2G	Ground	Rear window defogger switch	ON	Battery voltage
			OFF	0
5G			ON	Battery voltage
			OFF	0

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace fuse block (J/B).

## 7.CHECK CONDENSER

Check condenser. Refer to [DEF-24, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace condenser.

## 8.CHECK FILAMENT

Check the filament for damage or blown.  
Refer to [DEF-35, "Inspection and Repair"](#).

Is the inspection result normal?

# REAR WINDOW DEFOGGER

< DTC/CIRCUIT DIAGNOSIS >

---

YES >> GO TO 9.  
NO >> Repair filament.

## 9.CHECK INTERMITTENT INCIDENT

---

Check intermittent incident.  
Refer to [GI-43. "Intermittent Incident"](#).

>> INSPECTION END

## Component Inspection

INFOID:000000009716245

## 1.CHECK CONDENSER

---

Check continuity between condenser and ground part of condenser.

Condenser	Ground part of condenser	Continuity
Terminal		
1		Not existed

Is the inspection result normal?

YES >> INSPECTION END  
NO >> Replace condenser.



# DOOR MIRROR DEFOGGER

< DTC/CIRCUIT DIAGNOSIS >

## DOOR MIRROR DEFOGGER

### Component Function Check

INFOID:000000009238956

#### 1.CHECK DOOR MIRROR DEFOGGER

1. Perform Active Test ("REAR DEFOGGER") with CONSULT.
2. Touch "ON".
3. Check that both side door mirror glass is getting warmer.

Is the inspection result normal?

- YES >> Door mirror defogger is OK.  
NO >> Refer to [DEF-25. "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000009695237

#### 1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check that the following fuse is not fusing.

Fuse No.	Capacity
8	10 A

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

#### 2.CHECK FUSE BLOCK (J/B)

1. Turn ignition switch ON.
2. Check voltage between fuse block (J/B) harness connector and ground.

(+)		(-)	Condition	Voltage (V) (Approx.)	
Fuse block (J/B)					
Connector	Terminal				
M133	17C	Ground	Rear window defogger switch	ON	Battery voltage
			OFF	0	
	18C		Rear window defogger switch	ON	Battery voltage
			OFF	0	

Is the inspection result normal?

- YES >> GO TO 3.  
NO >> Repair or replace fuse block (J/B).

#### 3.CHECK INTERMITTENT INCIDENT

Check intermittent incident.  
Refer to [GI-43. "Intermittent Incident"](#).

>> INSPECTION END

# DRIVER SIDE DOOR MIRROR DEFOGGER

< DTC/CIRCUIT DIAGNOSIS >

## DRIVER SIDE DOOR MIRROR DEFOGGER

### Component Function Check

INFOID:000000009238958

#### 1. CHECK DRIVER SIDE DOOR MIRROR DEFOGGER

1. Perform Active Test ("REAR DEFOGGER") with CONSULT.
2. Touch "ON".
3. Check that the driver side door mirror glass is getting warmer.

Is the inspection result normal?

- YES >> Driver side door mirror defogger is OK.  
 NO >> Refer to [DEF-26. "Diagnosis Procedure"](#)

### Diagnosis Procedure

INFOID:000000009238959

#### 1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door mirror (driver side) connector.
3. Turn ignition switch ON.
4. Check voltage between door mirror (driver side) harness connector and ground.

Without automatic drive positioner

(+)		(-)	Condition	Voltage (V) (Approx.)
Door mirror (driver side) Connector	Terminal			
D3	7	Ground	Rear window defogger switch	ON Battery voltage
			OFF 0	

With automatic drive positioner

(+)		(-)	Condition	Voltage (V) (Approx.)
Door mirror (driver side) Connector	Terminal			
D56	7	Ground	Rear window defogger switch	ON Battery voltage
			OFF 0	

Is the inspection result normal?

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

#### 2. CHECK DRIVER SIDE DOOR MIRROR DEFOGGER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect fuse block (J/B) connector.
3. Check continuity between fuse block (J/B) harness connector and door mirror (driver side) harness connector.

Without automatic drive positioner

Fuse block (J/B)		Door mirror (driver side)		Continuity
Connector	Terminal	Connector	Terminal	
M133	17C	D3	7	Existed

With automatic drive positioner

Fuse block (J/B)		Door mirror (driver side)		Continuity
Connector	Terminal	Connector	Terminal	
M133	17C	D56	7	Existed

4. Check continuity between fuse block (J/B) harness connector and ground.

# DRIVER SIDE DOOR MIRROR DEFOGGER

## < DTC/CIRCUIT DIAGNOSIS >

Fuse block (J/B)		Ground	Continuity
Connector	Terminal		
M133	17C	Ground	Not existed

Is the inspection result normal?

- YES >> Replace fuse block (J/B).  
 NO >> Repair or replace harness.

### 3.CHECK GROUND CIRCUIT

- Turn ignition switch OFF.
- Check continuity between door mirror (driver side) harness connector and ground.

Without automatic drive positioner

Door mirror (driver side)		Ground	Continuity
Connector	Terminal		
D3	19	Ground	Existed

With automatic drive positioner

Door mirror (driver side)		Ground	Continuity
Connector	Terminal		
D56	19	Ground	Existed

Is the inspection result normal?

- YES >> Replace glass mirror (driver side). Refer to [MIR-49, "DOOR MIRROR : Removal and Installation"](#) (with automatic drive positioner) or [MIR-84, "DOOR MIRROR : Removal and Installation"](#) (without automatic drive positioner).  
 NO >> Repair or replace harness.

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

DEF

# PASSENGER SIDE DOOR MIRROR DEFOGGER

< DTC/CIRCUIT DIAGNOSIS >

## PASSENGER SIDE DOOR MIRROR DEFOGGER

### Component Function Check

INFOID:000000009238961

#### 1. CHECK PASSENGER SIDE DOOR MIRROR DEFOGGER

1. Perform Active Test ("REAR DEFOGGER") with CONSULT.
2. Touch "ON".
3. Check that the passenger side door mirror glass is getting warmer.

Is the inspection result normal?

YES >> Passenger side door mirror defogger is OK.

NO >> Refer to [DEF-28. "Diagnosis Procedure"](#)

### Diagnosis Procedure

INFOID:000000009238962

#### 1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door mirror (passenger side) connector.
3. Turn ignition switch ON.
4. Check voltage between door mirror (passenger side) harness connector and ground.

Without automatic drive positioner

(+)		(-)	Condition	Voltage (V) (Approx.)
Door mirror (Passenger side) Connector	Terminal			
D17	7	Ground	Rear window defogger switch	ON Battery voltage
			OFF 0	

With automatic drive positioner

(+)		(-)	Condition	Voltage (V) (Approx.)
Door mirror (Passenger side) Connector	Terminal			
D57	7	Ground	Rear window defogger switch	ON Battery voltage
			OFF 0	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

#### 2. CHECK PASSENGER SIDE DOOR MIRROR DEFOGGER

1. Turn ignition switch OFF.
2. Disconnect fuse block (J/B) connector.
3. Check continuity between fuse block (J/B) harness connector and door mirror (passenger side) harness connector.

Without automatic drive positioner

Fuse block (J/B)		Door mirror (passenger side)		Continuity
Connector	Terminal	Connector	Terminal	
M133	18C	D17	7	Existed

With automatic drive positioner

Fuse block (J/B)		Door mirror (passenger side)		Continuity
Connector	Terminal	Connector	Terminal	
M133	18C	D57	7	Existed

4. Check continuity between fuse block (J/B) harness connector and ground.

# PASSENGER SIDE DOOR MIRROR DEFOGGER

## < DTC/CIRCUIT DIAGNOSIS >

Fuse block (J/B)		Ground	Continuity
Connector	Terminal		
M133	18C	Ground	Not existed

Is the inspection result normal?

- YES >> Replace fuse block (J/B).  
 NO >> Repair or replace harness.

### 3. CHECK GROUND CIRCUIT

- Turn ignition switch OFF.
- Check continuity between door mirror (passenger side) harness connector and ground.

Without automatic drive positioner

Door mirror (passenger side)		Ground	Continuity
Connector	Terminal		
D17	19	Ground	Existed

With automatic drive positioner

Door mirror (passenger side)		Ground	Continuity
Connector	Terminal		
D57	19	Ground	Existed

Is the inspection result normal?

- YES >> Replace glass mirror (passenger side). Refer to [MIR-49, "DOOR MIRROR : Removal and Installation"](#) (with automatic drive positioner) or [MIR-84, "DOOR MIRROR : Removal and Installation"](#) (without automatic drive positioner).  
 NO >> Repair or replace harness.

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

DEF

# REAR WINDOW DEFOGGER AND DOOR MIRROR DEFOGGER DO NOT OPERATE

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### REAR WINDOW DEFOGGER AND DOOR MIRROR DEFOGGER DO NOT OPERATE

#### Diagnosis Procedure

INFOID:000000009238964

#### 1. CHECK REAR WINDOW DEFOGGER SWITCH

Check rear window defogger switch.

Refer to [DEF-19, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the malfunctioning parts.

#### 2. CHECK REAR WINDOW DEFOGGER RELAY

Check rear window defogger relay.

Refer to [DEF-20, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning parts.

#### 3. CHECK DOOR MIRROR DEFOGGER

Check door mirror defogger.

Refer to [DEF-25, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning parts.

#### 4. CONFIRM THE OPERATION

Confirm the operation again.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> GO TO 1.

# REAR WINDOW DEFOGGER DOES NOT OPERATE BUT BOTH DOOR MIRROR DEFOGGERS OPERATE

< SYMPTOM DIAGNOSIS >

## REAR WINDOW DEFOGGER DOES NOT OPERATE BUT BOTH DOOR MIRROR DEFOGGERS OPERATE

### Diagnosis Procedure

INFOID:000000009238965

#### 1. CHECK REAR WINDOW DEFOGGER

Check rear window defogger.

Refer to [DEF-22, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the malfunctioning parts.

#### 2. CONFIRM THE OPERATION

Confirm the operation again

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> GO TO 1.

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

# DOOR MIRROR DEFOGGER DOES NOT OPERATE BUT REAR WINDOW DEFOGGER OPERATES

< SYMPTOM DIAGNOSIS >

## DOOR MIRROR DEFOGGER DOES NOT OPERATE BUT REAR WINDOW DEFOGGER OPERATES

BOTH SIDES

BOTH SIDES : Diagnosis Procedure

INFOID:000000009238966

### 1.CHECK DOOR MIRROR DEFOGGER

---

Check door mirror defogger.

Refer to [DEF-25, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the malfunctioning parts.

### 2.CONFIRM THE OPERATION

---

Confirm the operation again.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> GO TO 1.

DRIVER SIDE

DRIVER SIDE : Diagnosis Procedure

INFOID:000000009238967

### 1.CHECK DRIVER SIDE DOOR MIRROR DEFOGGER

---

Check driver side door mirror defogger.

Refer to [DEF-26, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the malfunctioning parts.

### 2.CONFIRM THE OPERATION

---

Confirm the operation again.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> GO TO 1.

PASSENGER SIDE

PASSENGER SIDE : Diagnosis Procedure

INFOID:000000009238968

### 1.CHECK PASSENGER SIDE DOOR MIRROR DEFOGGER.

---

Check passenger side door mirror defogger.

Refer to [DEF-28, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the malfunctioning parts.

### 2.CONFIRM THE OPERATION

---

Confirm the operation again.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> GO TO 1.



# ON IS NOT DISPLAYED WHEN PRESSING REAR WINDOW DEFOGGER SWITCH BUT IT IS OPERATED

< SYMPTOM DIAGNOSIS >

## ON IS NOT DISPLAYED WHEN PRESSING REAR WINDOW DEFOGGER SWITCH BUT IT IS OPERATED

### Diagnosis Procedure

INFOID:000000009238969

#### 1.CHECK DISPLAY CONTROL UNIT FUNCTION

Check that the display control unit is operating normally.

Refer to [AV-162, "Work Flow"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the malfunctioning parts.

#### 2.CONFIRM THE OPERATION

Confirm the operation again.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> GO TO 1.

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

## REAR WINDOW DEFOGGER INDICATOR DOES NOT ILLUMINATE

< SYMPTOM DIAGNOSIS >

---

### REAR WINDOW DEFOGGER INDICATOR DOES NOT ILLUMINATE

#### Diagnosis Procedure

INFOID:000000009238970

#### 1. CHECK INTEGRAL SWITCH (REAR WINDOW DEFOGGER SWITCH)

---

Check rear window defogger switch. Refer to [DEF-19, "Component Function Check"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace integral switch (rear window defogger switch).

# FILAMENT

< REMOVAL AND INSTALLATION >

## REMOVAL AND INSTALLATION

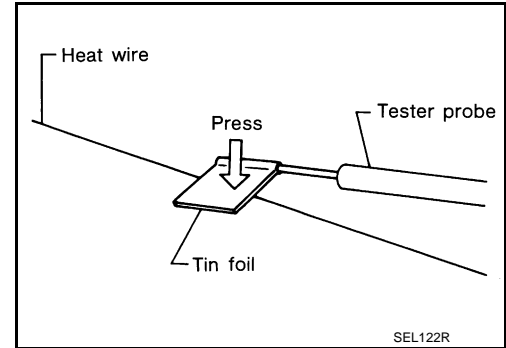
### FILAMENT

#### Inspection and Repair

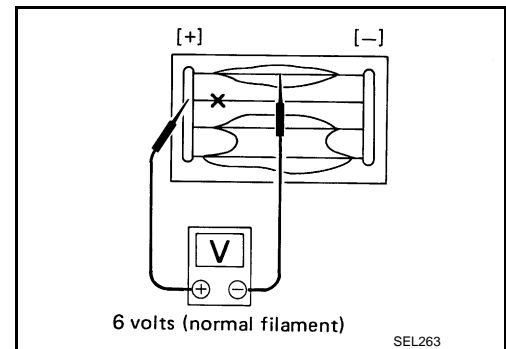
INFOID:000000009238971

#### INSPECTION

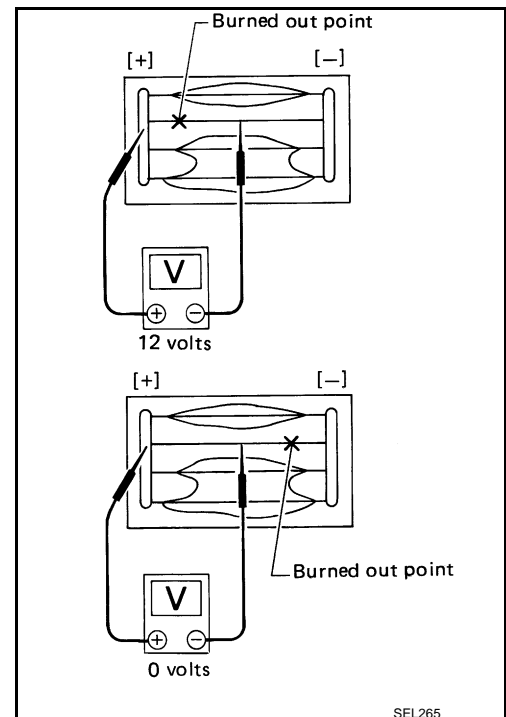
1. When measuring voltage, wrap tin foil around the top of the negative probe. Then press the foil against the wire with your finger.



2. Attach probe circuit tester (in Volt range) to middle portion of each filament.



3. If a filament is burned out, circuit tester registers 0 or battery voltage.
4. To locate burned out point, move probe to left and right along filament. Test needle will swing abruptly when probe passes the point.



#### REPAIR

##### REPAIR EQUIPMENT

- Conductive silver composition (Dupont No. 4817 or equivalent)

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

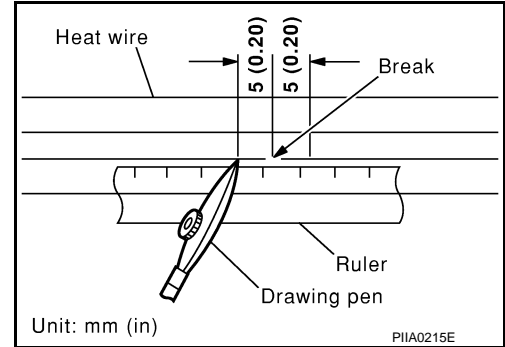
# FILAMENT

## < REMOVAL AND INSTALLATION >

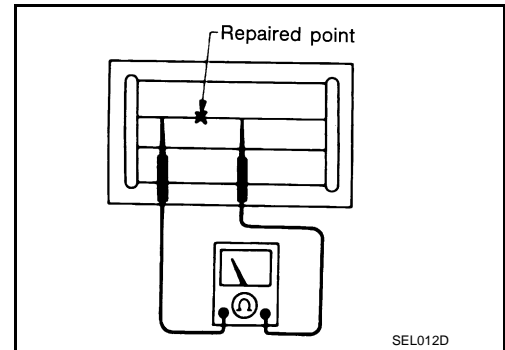
- Ruler 30 cm (11.8 in) long
- Drawing pen
- Heat gun
- Alcohol
- Cloth

### REPAIRING PROCEDURE

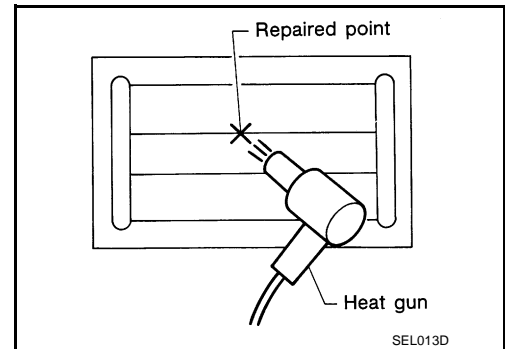
1. Wipe broken heat wire and its surrounding area clean with a cloth dampened in alcohol.
2. Apply a small amount of conductive silver composition to tip of drawing pen. Shake silver composition container before use.
3. Place ruler on glass along broken line. Deposit conductive silver composition on break with drawing pen. Slightly overlap existing heat wire on both sides [preferably 5 mm (0.20 in)] of the break.



4. After repair has been completed, check repaired wire for continuity. This check should be conducted 10 minutes after silver composition is deposited. Do not touch repaired area while test is being conducted.



5. Apply a constant stream of hot air directly to the repaired area for approximately 20 minutes with a heat gun. A minimum distance of 3 cm (1.2 in) should be kept between repaired area and hot air outlet. If a heat gun is not available, let the repaired area dry for 24 hours.



# CONDENSER

< REMOVAL AND INSTALLATION >

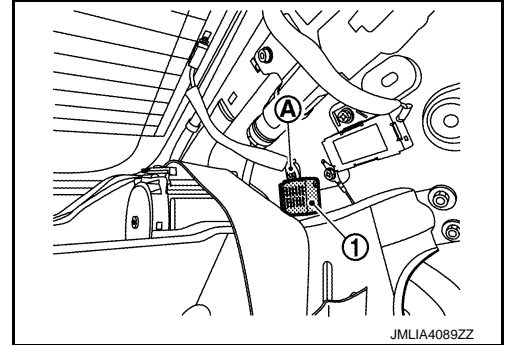
## CONDENSER

### Removal and Installation

INFOID:000000009687131

#### REMOVAL

1. Remove the rear pillar finisher.  
Refer to [INT-33, "Removal and Installation"](#).
2. Remove the condenser mounting bolt (A), and then remove the condenser (1).



#### INSTALLATION

Install in the reverse order of removal.

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