

SECTION **PCS**

POWER CONTROL SYSTEM

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

CONTENTS

<p style="text-align: center;">IPDM E/R</p> <p>PRECAUTION 2</p> <p>PRECAUTIONS 2</p> <p style="padding-left: 20px;">Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 2</p> <p>SYSTEM DESCRIPTION 3</p> <p>COMPONENT PARTS 3</p> <p style="padding-left: 20px;">Component Parts Location 3</p> <p>SYSTEM 4</p> <p>RELAY CONTROL SYSTEM 4</p> <p style="padding-left: 20px;">RELAY CONTROL SYSTEM : System Diagram 4</p> <p style="padding-left: 20px;">RELAY CONTROL SYSTEM : System Description 5</p> <p>POWER CONTROL SYSTEM 5</p> <p style="padding-left: 20px;">POWER CONTROL SYSTEM : System Diagram 5</p> <p style="padding-left: 20px;">POWER CONTROL SYSTEM : System Description 5</p> <p>SIGNAL BUFFER SYSTEM 5</p> <p style="padding-left: 20px;">SIGNAL BUFFER SYSTEM : System Diagram 6</p> <p style="padding-left: 20px;">SIGNAL BUFFER SYSTEM : System Description 6</p> <p>POWER CONSUMPTION CONTROL SYSTEM 6</p> <p style="padding-left: 20px;">POWER CONSUMPTION CONTROL SYSTEM : System Diagram 6</p> <p style="padding-left: 20px;">POWER CONSUMPTION CONTROL SYSTEM : System Description 6</p>	<p>DIAGNOSIS SYSTEM (IPDM E/R) 8</p> <p style="padding-left: 20px;">Diagnosis Description 8</p> <p style="padding-left: 20px;">CONSULT Function (IPDM E/R) 10</p> <p>ECU DIAGNOSIS INFORMATION 12</p> <p>IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) 12</p> <p style="padding-left: 20px;">Reference Value 12</p> <p style="padding-left: 20px;">Terminal Layout 13</p> <p style="padding-left: 20px;">Physical Values 13</p> <p style="padding-left: 20px;">Fail Safe 16</p> <p style="padding-left: 20px;">DTC Index 17</p> <p>WIRING DIAGRAM 19</p> <p>IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) 19</p> <p style="padding-left: 20px;">Wiring Diagram 19</p> <p>DTC/CIRCUIT DIAGNOSIS 23</p> <p>U1000 CAN COMM CIRCUIT 23</p> <p style="padding-left: 20px;">Description 23</p> <p style="padding-left: 20px;">DTC Logic 23</p> <p style="padding-left: 20px;">Diagnosis Procedure 23</p> <p>POWER SUPPLY AND GROUND CIRCUIT 24</p> <p style="padding-left: 20px;">Diagnosis Procedure 24</p> <p>REMOVAL AND INSTALLATION 25</p> <p>IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) 25</p> <p style="padding-left: 20px;">Removal and Installation 25</p>
---	---

PCS

PRECAUTION

PRECAUTIONS

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

INFOID:000000012519566

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.

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

WARNING:

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

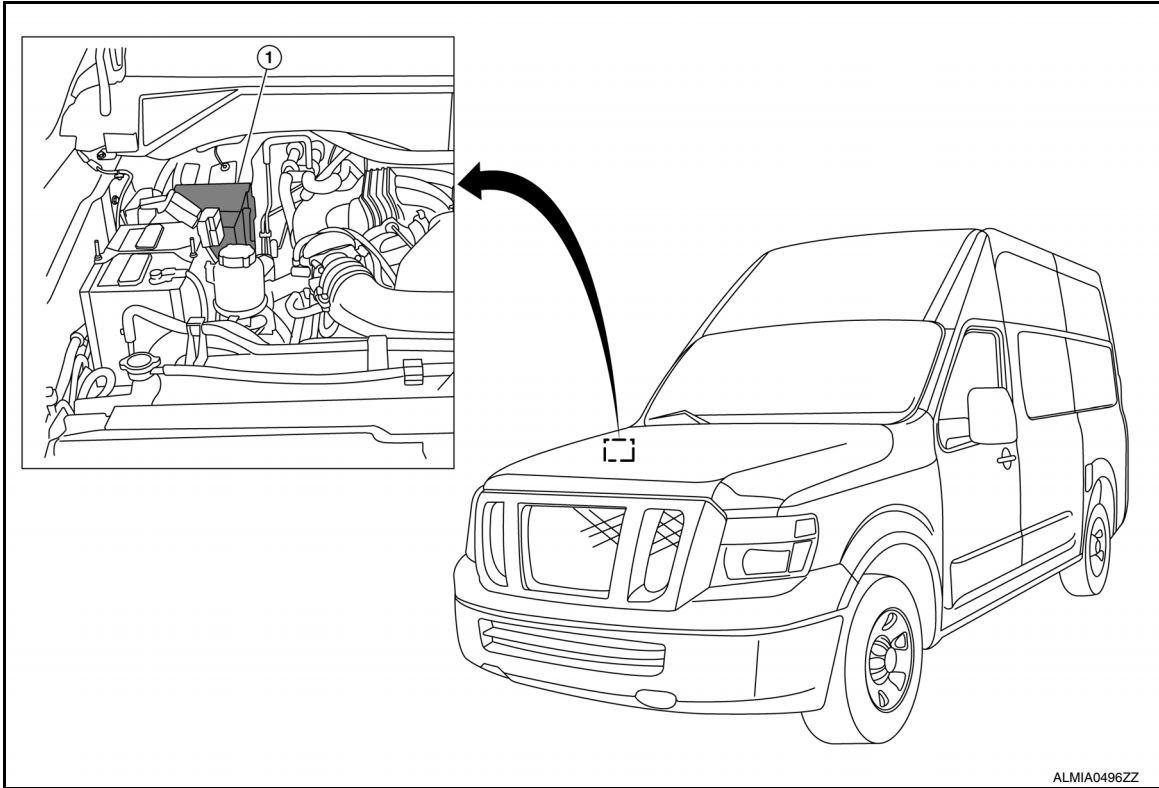
< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000012519567



- 1. IPDM E/R

A
B
C
D
E
F
G
H
I
J
K
L

PCS

N
O
P

SYSTEM

< SYSTEM DESCRIPTION >

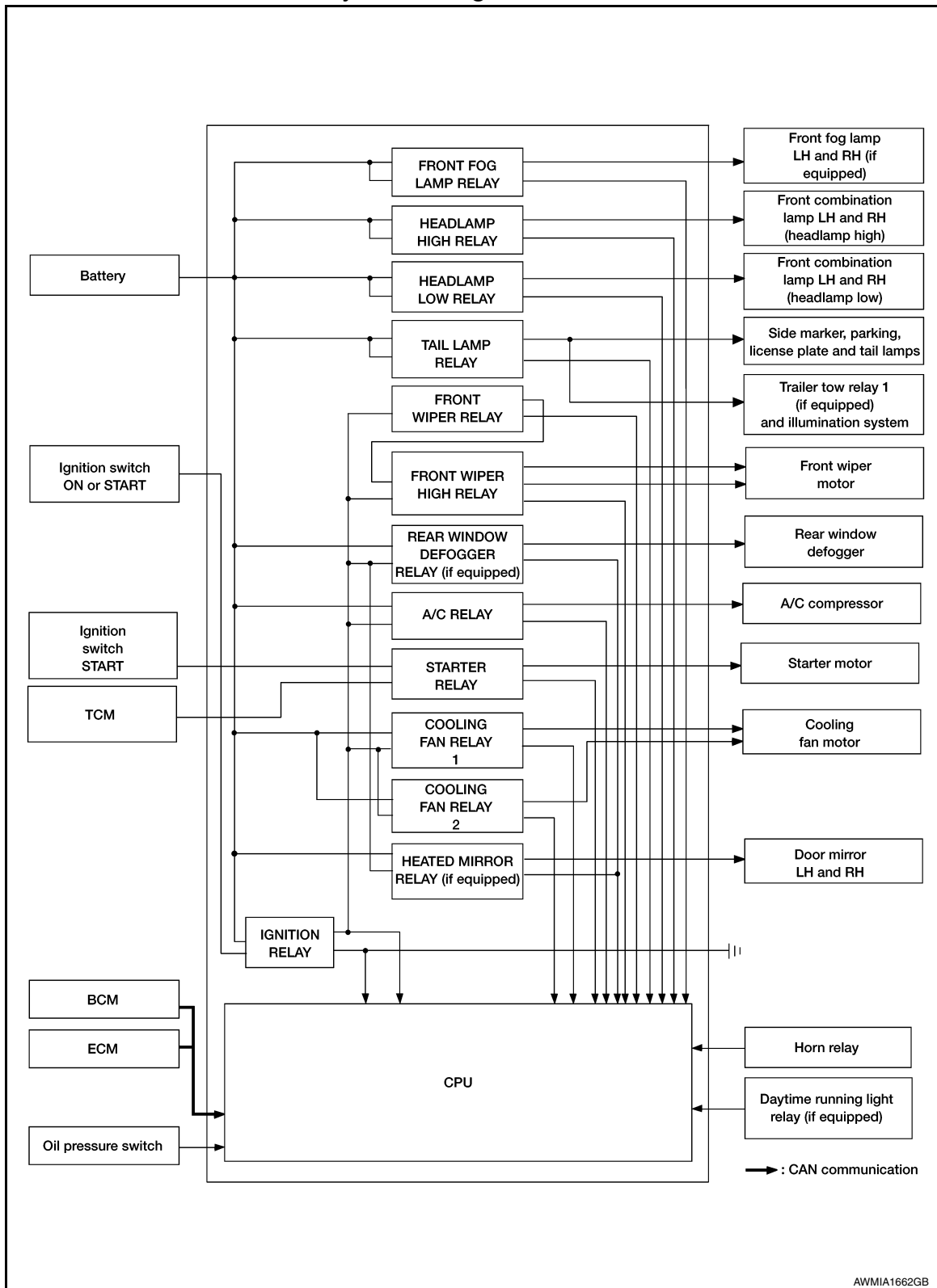
[IPDM E/R]

SYSTEM

RELAY CONTROL SYSTEM

RELAY CONTROL SYSTEM : System Diagram

INFOID:000000012519568



AWMIA1662GB

SYSTEM

< SYSTEM DESCRIPTION >

[IPDM E/R]

RELAY CONTROL SYSTEM : System Description

INFOID:000000012519569

IPDM E/R activates the internal control circuit to perform the relay ON-OFF control according to the input signals from various sensors and the request signals received from control units via CAN communication.

CAUTION:

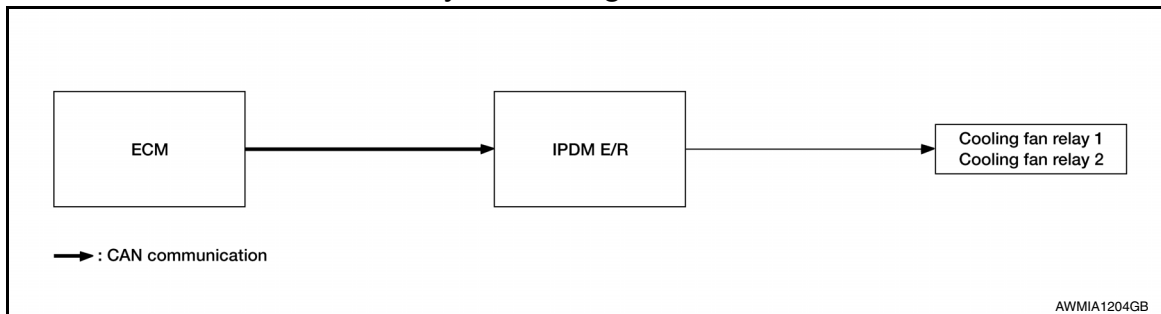
IPDM E/R integrated relays cannot be removed.

Control relay	Input/output	Transmit unit	Control part	Reference page
<ul style="list-style-type: none"> Headlamp high relay Headlamp low relay 	<ul style="list-style-type: none"> High beam request signal Low beam request signal 	BCM (CAN)	<ul style="list-style-type: none"> Headlamp high Headlamp low Daytime running light relay 2 	EXL-8 EXL-9
Tail lamp relay	Position light request signal	BCM (CAN)	<ul style="list-style-type: none"> Side marker lamps Parking lamps License plate lamps Tail lamps Trailer tow relay 1 Illumination system 	EXL-12 INL-10
Front fog lamp relay	Fog lamp request signal	BCM (CAN)	Front fog lamps	EXL-10
<ul style="list-style-type: none"> Front wiper relay Front wiper high relay 	Front wiper request signal	BCM (CAN)	Front wiper motor	WW-5
Rear window defogger relay	Rear window defogger request signal	BCM (CAN)	Rear window defogger	DEF-8
A/C relay	A/C request signal	<ul style="list-style-type: none"> BCM (CAN) ECM (CAN) 	A/C compressor	HAC-127
Starter relay	Ignition switch START signal	TCM	Starter motor	STR-8
Cooling fan relay 1 Cooling fan relay 2	Cooling fan request signal	ECM (CAN)	Cooling fan motor (low) Cooling fan motor (hi)	EC-45 (VQ40DE) EC-497 (VK56DE)
Heated mirror relay	Heated mirror request signal	BCM (CAN)	Door mirrors	MIR-4
Ignition relay	Ignition switch ON or START signal	Ignition switch	Ignition switch ON or START power	EC-41 (VQ40DE) EC-493 (VK56DE)

POWER CONTROL SYSTEM

POWER CONTROL SYSTEM : System Diagram

INFOID:000000012519570



POWER CONTROL SYSTEM : System Description

INFOID:000000012519571

COOLING FAN CONTROL

IPDM E/R controls the cooling fan according to the status of the cooling fan speed request signal received from ECM via CAN communication. Refer to [LAN-7, "CAN COMMUNICATION SYSTEM : System Description"](#).

SIGNAL BUFFER SYSTEM

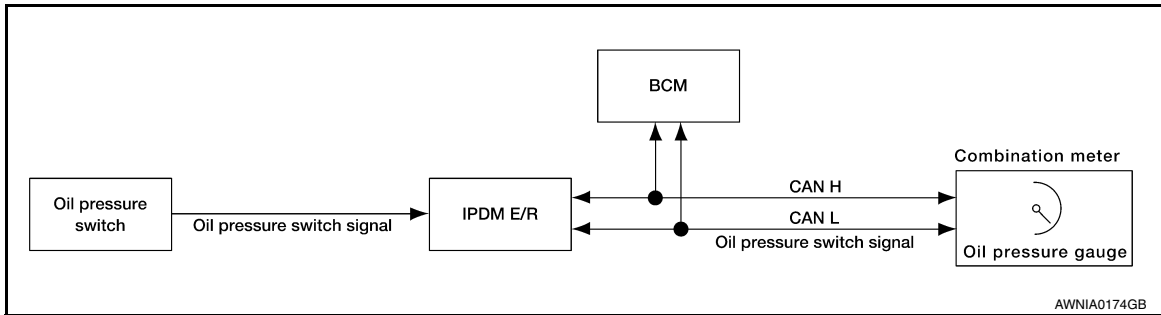
SYSTEM

< SYSTEM DESCRIPTION >

[IPDM E/R]

SIGNAL BUFFER SYSTEM : System Diagram

INFOID:000000012519572



SIGNAL BUFFER SYSTEM : System Description

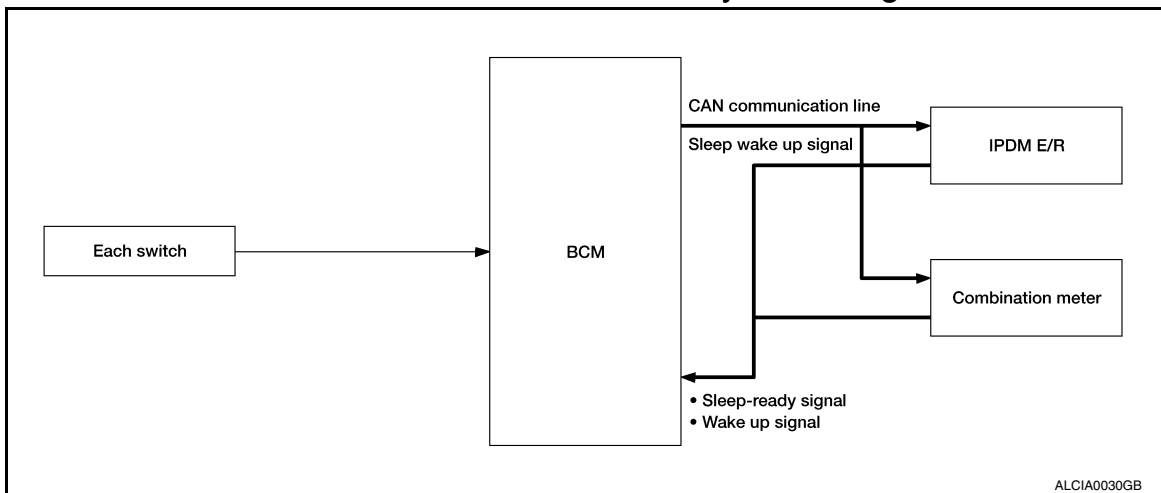
INFOID:000000012519573

IPDM E/R reads the status of the oil pressure switch and transmits the oil pressure switch signal to BCM via CAN communication. Refer to [LAN-7, "CAN COMMUNICATION SYSTEM : System Description"](#).

POWER CONSUMPTION CONTROL SYSTEM

POWER CONSUMPTION CONTROL SYSTEM : System Diagram

INFOID:000000012519574



POWER CONSUMPTION CONTROL SYSTEM : System Description

INFOID:000000012519575

OUTLINE

- IPDM E/R incorporates a power consumption control function that reduces the power consumption according to the vehicle status.
- IPDM E/R changes its status (control mode) with the sleep wake-up signal received from BCM via CAN communication.

Normal mode (wake-up)

- CAN communication is normally performed with other control units.
- Individual unit control by IPDM E/R is normally performed.

Low power consumption mode (sleep)

- Low power consumption control is active.
- CAN transmission is stopped.

SLEEP MODE ACTIVATION

- IPDM E/R judges that the sleep-ready conditions are fulfilled when the ignition switch is OFF and none of the conditions below are present. Then it transmits a sleep-ready signal (ready) to BCM via CAN communication.
 - Front wiper fail-safe operation
 - Outputting signals to actuators
 - Switches or relays operating
 - Auto active test is starting

SYSTEM

[IPDM E/R]

< SYSTEM DESCRIPTION >

- Emergency OFF
- Output requests are being received from control units via CAN communication.
- IPDM E/R stops CAN communication and enters the low power consumption mode when it receives a sleep wake up signal (sleep) from BCM and the sleep-ready conditions are fulfilled.

A

WAKE-UP OPERATION

- IPDM E/R changes from the low power consumption mode to the normal mode when it receives a sleep wake-up signal (wake-up) from BCM or any of the following conditions is fulfilled. In addition, it transmits a sleep-ready signal (not-ready) to BCM via CAN communication to report the CAN communication start.
- Ignition switch ON
- An output request is received from a control unit via CAN communication.

B

C

D

E

F

G

H

I

J

K

L

PCS

N

O

P

DIAGNOSIS SYSTEM (IPDM E/R)

Diagnosis Description

INFOID:000000012519576

AUTO ACTIVE TEST

Description

In auto active test mode, the IPDM E/R sends a drive signal to the following systems to check their operation.

- Oil pressure low warning indicator
- Rear window defogger (if equipped)
- Front wipers
- Tail, license plate, side marker and parking lamps
- Front fog lamps (if equipped)
- Headlamps (Hi, Lo)
- A/C compressor (magnetic clutch)
- Cooling fan

Operation Procedure

1. Close the hood and front door RH, and lift the wiper arms from the windshield (to prevent windshield damage due to wiper operation).
NOTE:
 When auto active test is performed with hood opened, sprinkle water on windshield beforehand.
2. Turn ignition switch OFF.
3. Turn the ignition switch ON and, within 20 seconds, press the front door switch LH 10 times. Then turn the ignition switch OFF.
4. Turn the ignition switch ON within 10 seconds. After that, the horn sounds once and the auto active test starts.
5. After a series of the following operations is repeated 3 times, auto active test is completed.

NOTE:

When auto active test mode has to be cancelled halfway through test, turn ignition switch OFF.

CAUTION:

- **If auto active test mode cannot be actuated, check door switch system. Refer to [DLK-50, "Description"](#).**
- **Do not start the engine.**

Inspection in Auto Active Test Mode

When auto active test mode is actuated, the following operation sequence is repeated 3 times.

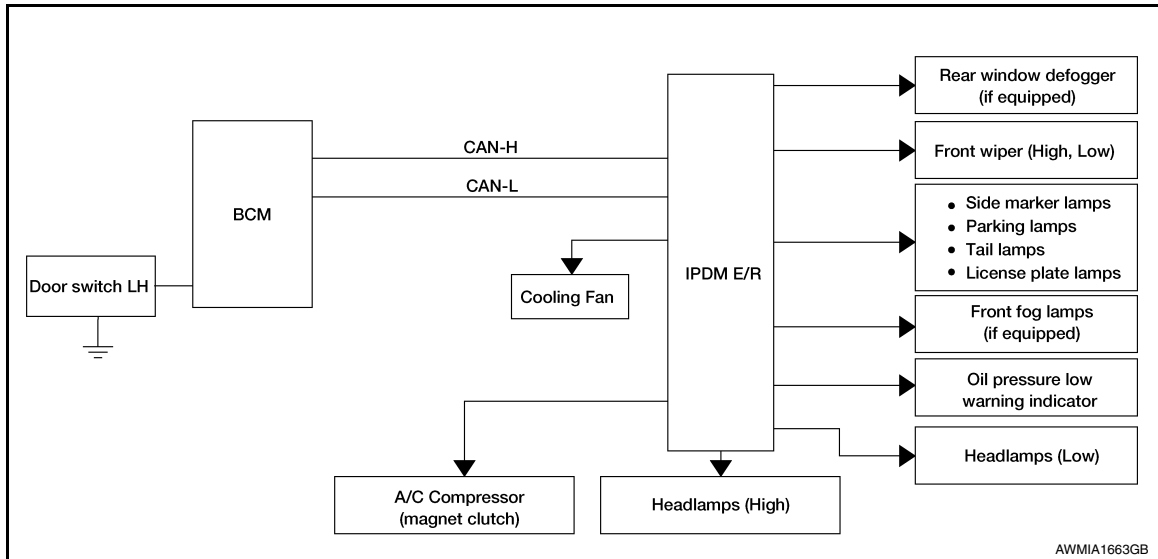
Operation sequence	Inspection Location	Operation
1	Oil pressure low warning indicator	Blinks continuously during operation of auto active test
2	Rear window defogger (if equipped)	10 seconds
3	Front wipers	LO for 5 seconds → HI for 5 seconds
4	Tail, license plate, side marker, parking lamps and front fog lamps (if equipped)	10 seconds
5	Headlamps	LO for 10 seconds → HI on-off for 5 seconds
6	A/C compressor	ON ⇔ OFF 5 times
7	Cooling fan	10 seconds

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

[IPDM E/R]

Concept of auto active test



- IPDM E/R starts the auto active test with the door switch signals transmitted by BCM via CAN communication. Therefore, the CAN communication line between IPDM E/R and BCM is considered normal if the auto active test starts successfully.
- The auto active test facilitates troubleshooting if any systems controlled by IPDM E/R cannot be operated.

Diagnosis chart in auto active test mode

Symptom	Inspection contents	Possible cause
Oil pressure low warning indicator does not operate	Perform auto active test. Does the oil pressure low warning indicator blink?	YES <ul style="list-style-type: none"> • IPDM E/R signal input circuit • CAN communication signal between ECM and combination meter • Oil pressure switch wiring • Oil pressure switch
		NO <ul style="list-style-type: none"> • CAN communication signal between IPDM E/R, BCM and combination meter
Rear window defogger (if equipped) does not operate	Perform auto active test. Does the rear window defogger operate?	YES <ul style="list-style-type: none"> • BCM signal input circuit
		NO <ul style="list-style-type: none"> • Harness or connector between front air control • CAN communication signal between BCM and IPDM E/R • Rear window defogger • Rear window defogger ground • IPDM E/R
Any of the following components do not operate <ul style="list-style-type: none"> • Front wipers • Tail lamps • License plate lamps • Parking lamps • Front fog lamps (if equipped) • Headlamps (Hi, Lo) • Side marker lamps 	Perform auto active test. Does the applicable system operate?	YES <ul style="list-style-type: none"> • BCM signal input system
		NO <ul style="list-style-type: none"> • Lamp or front wiper motor malfunction • Lamp or front wiper motor ground circuit • Harness or connector between IPDM E/R and applicable system • IPDM E/R

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

PCS

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

[IPDM E/R]

Symptom	Inspection contents		Possible cause
A/C compressor does not operate	Perform auto active test. Does the A/C compressor operate?	YES	<ul style="list-style-type: none"> • BCM signal input circuit • CAN communication signal between BCM and ECM • CAN communication signal between ECM and IPDM E/R
		NO	<ul style="list-style-type: none"> • Magnetic clutch malfunction • Harness or connector between IPDM E/R and magnetic clutch • IPDM E/R (integrated relay malfunction)
Cooling fan does not operate	Perform auto active test. Does the cooling fan operate?	YES	<ul style="list-style-type: none"> • ECM signal input circuit • CAN communication signal between ECM and IPDM E/R
		NO	<ul style="list-style-type: none"> • Cooling fan motor malfunction • Harness or connector between IPDM E/R and cooling fan • IPDM E/R (integrated relay malfunction)

CONSULT Function (IPDM E/R)

INFOID:000000012519577

APPLICATION ITEM

CONSULT performs the following functions via CAN communication with IPDM E/R.

Direct Diagnostic Mode	Description
Self Diagnostic Result	The IPDM E/R self diagnostic results are displayed.
Data Monitor	The IPDM E/R input/output data is displayed in real time.
Active Test	The IPDM E/R activates outputs to test components.
CAN Diag Support Mntr	The result of transmit/receive diagnosis of CAN communication is displayed.

SELF DIAGNOSTIC RESULT

Refer to [PCS-17, "DTC Index"](#).

DATA MONITOR

Monitor Item [Unit]	Main Signals	Description
MOTOR FAN REQ [1/2/3/4]	×	Indicates cooling fan speed signal received from ECM on CAN communication line
AC COMP REQ [On/Off]	×	Indicates A/C compressor request signal received from ECM on CAN communication line
TAIL&CLR REQ [On/Off]	×	Indicates position light request signal received from BCM on CAN communication line
HL LO REQ [On/Off]	×	Indicates low beam request signal received from BCM on CAN communication line
HL HI REQ [On/Off]	×	Indicates high beam request signal received from BCM on CAN communication line
FR FOG REQ [On/Off]	×	Indicates fog lamp request signal received from BCM on CAN communication line
FR WIP REQ [Stop/1LOW/Low/Hi]	×	Indicates front wiper request signal received from BCM on CAN communication line

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

[IPDM E/R]

Monitor Item [Unit]	Main Signals	Description
WIP AUTO STOP [STOP P/ACT P]	×	Indicates condition of front wiper auto stop signal
WIP PROT [Off/BLOCK]	×	Indicates condition of front wiper fail-safe operation
ST RLY REQ [On/Off]		Indicates starter request signal received from ECM on CAN communication line
IGN RLY [On/Off]	×	Indicates condition of ignition relay
RR DEF REQ [On/Off]	×	Indicates rear defogger request signal received from AV control unit on CAN communication line
OIL P SW [Open/Close]		Indicates condition of oil pressure switch
DTRL REQ [On/Off]		Indicates daytime running light request signal received from BCM on CAN communication line
THFT HRN REQ [On/Off]		Indicates theft warning horn request signal received from BCM on CAN communication line
HORN CHIRP [On/Off]		Indicates horn reminder signal received from BCM on CAN communication line

ACTIVE TEST

Test item	Description
REAR DEFOGGER	This test is able to check rear defogger operation [On/Off].
FRONT WIPER	This test is able to check wiper motor operation [Hi/Lo/Off].
MOTOR FAN	This test is able to check cooling fan operation [4/3/2/1].
EXTERNAL LAMPS	This test is able to check external lamp operation [Hi/Lo/TAIL/Fog/Off].
HORN	This test is able to check horn operation [On].

CAN DIAG SUPPORT MNTR

Refer to [LAN-13. "CAN Diagnostic Support Monitor"](#).

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

PCS

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

[IPDM E/R]

ECU DIAGNOSIS INFORMATION

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

Reference Value

INFOID:0000000012519578

VALUES ON THE DIAGNOSIS TOOL

Monitor Item	Condition		Value/Status
MOTOR FAN REQ	Engine idle speed	Changes depending on engine coolant temperature, air conditioner operation status, vehicle speed, etc.	1, 2, 3, 4
AC COMP REQ	A/C switch OFF		Off
	A/C switch ON		On
TAIL&CLR REQ	Lighting switch OFF		Off
	Lighting switch 1ST, 2ND, HI or AUTO (Light is illuminated)		On
HL LO REQ	Lighting switch OFF		Off
	Lighting switch 2ND HI or AUTO (Light is illuminated)		On
HL HI REQ	Lighting switch OFF		Off
	Lighting switch HI		On
FR FOG REQ	Fog lamp switch OFF		Off
	Fog lamp switch ON		On
FR WIP REQ	Ignition switch ON	Front wiper switch OFF	Stop
		Front wiper switch INT	1LOW
		Front wiper switch LO	Low
		Front wiper switch HI	Hi
WIP AUTO STOP	Ignition switch ON	Front wiper stop position	STOP P
		Any position other than front wiper stop position	ACT P
WIP PROT	Ignition switch ON	Front wiper operates normally	Off
		Front wiper stops at fail-safe operation	BLOCK
ST RLY REQ	Ignition switch OFF or ACC		Off
	Ignition switch START		On
IGN RLY	Ignition switch OFF or ACC		Off
	Ignition switch ON		On
RR DEF REQ	Rear defogger switch OFF		Off
	Rear defogger switch ON		On
OIL P SW	Ignition switch OFF, ACC or engine running		Open
	Ignition switch ON		Close
DTRL REQ	Not operated		Off
	Daytime Running Lights ON		On
THFT HRN REQ	Not operated		Off
	<ul style="list-style-type: none"> Panic alarm is activated Horn is activated with VEHICLE SECURITY (THEFT WARNING) SYSTEM 		On
HORN CHIRP	Not operated		Off
	Door locking with keyfob (horn chirp mode)		On

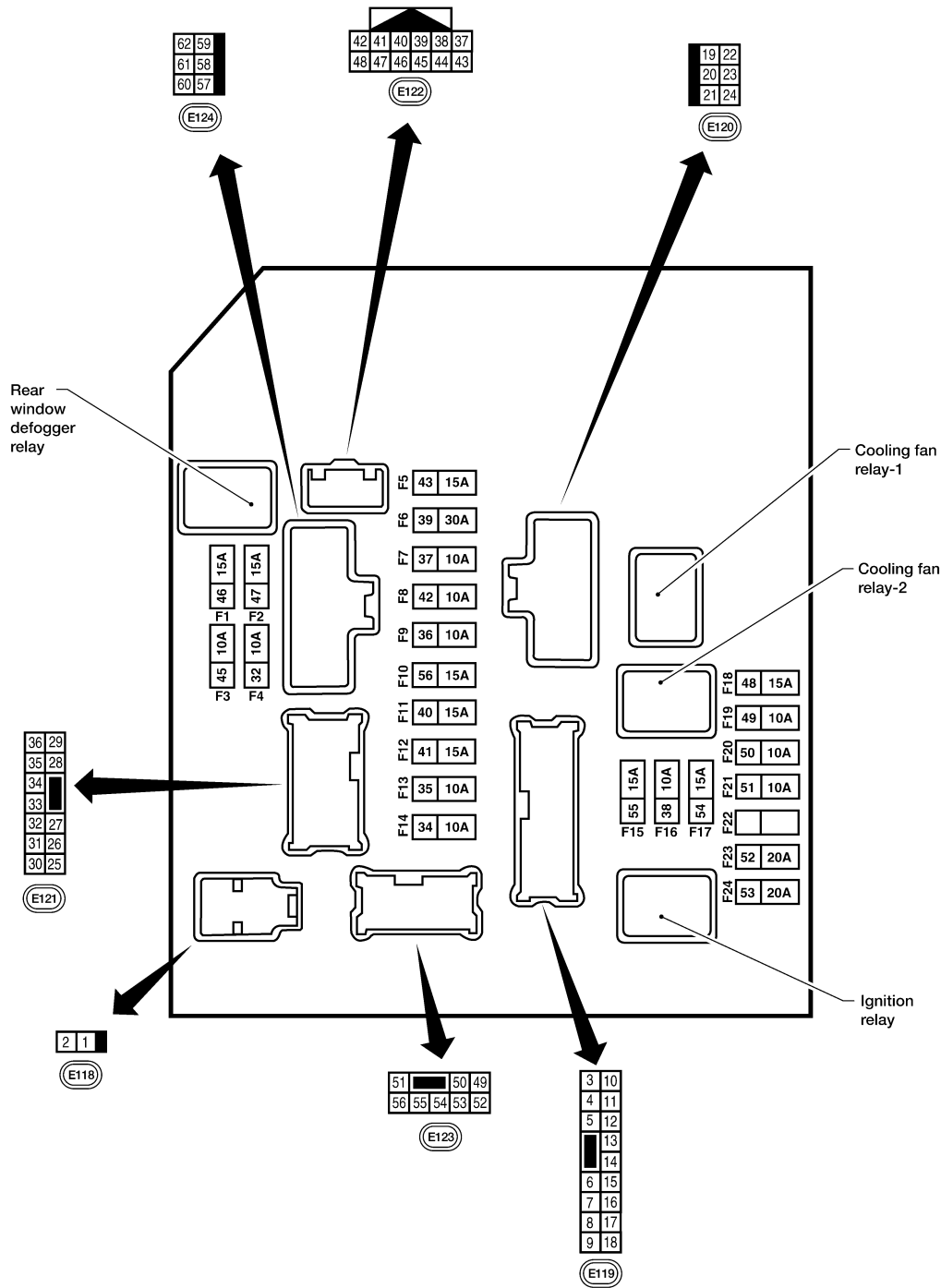
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

[IPDM E/R]

Terminal Layout

INFOID:000000012519579



A
B
C
D
E
F
G
H
I
J
K
L

PCS

N
O
P

NOTE:

Numbers preceded by an "F" represent the fuse numbers imprinted on the IPDM E/R. The other numbers represent the fuse numbers as they appear in the wiring diagrams.

Physical Values

PHYSICAL VALUES

AAMIA1032GB

INFOID:000000012519580

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

[IPDM E/R]

Terminal	Wire color	Signal name	Signal input/output	Measuring condition		Reference value (Approx.)
				Ignition switch	Operation or condition	
1	W/R	Battery power supply	Input	OFF	—	Battery voltage
2	R	Battery power supply	Input	OFF	—	Battery voltage
3	O	ECM relay	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
4	BR	ECM relay	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
6	L	Throttle control motor relay	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
7	W	ECM relay control	Input	—	Ignition switch ON or START	0V
					Ignition switch OFF or ACC	Battery voltage
8	V	Fuse 54	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
10	G	Fuse 45 (Except for Mexico)	Output	ON	Daytime running light system active	0V
					Daytime running light system inactive	Battery voltage
11	W	A/C compressor	Output	ON or START	A/C switch ON or defrost A/C switch	Battery voltage
					A/C switch OFF or defrost A/C switch	0V
12	W	Ignition switch supplied power	Input	—	OFF or ACC	0V
					ON or START	Battery voltage
13	R	Fuel pump relay	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
14	Y	Fuse 49	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
15	GR	Fuse 50	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
16	G	Fuse 51	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
17	W	Fuse 55	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
19	W	Starter motor	Output	START	—	Battery voltage
20	Y	Cooling fan relay 1	Output	—	Conditions correct for cooling fan operation	Battery voltage
					Conditions not correct for cooling fan operation	0V
21	Y	Ignition switch supplied power	Input	—	OFF or ACC	0V
					START	Battery voltage
22	G	Battery power supply	Output	OFF	—	Battery voltage

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

[IPDM E/R]

Terminal	Wire color	Signal name	Signal input/output	Measuring condition		Reference value (Approx.)
				Ignition switch	Operation or condition	
23	G	Door mirror defogger output signal	Output	—	When rear defogger switch is ON	Battery voltage
					When rear defogger switch is OFF	0V
24	W	Cooling fan relay 2	Output	—	Conditions correct for cooling fan operation	Battery voltage
					Conditions not correct for cooling fan operation	0V
26	R	Fuse 41 (Canada only)	Output	ON	Daytime running light system active	0V
					Daytime running light system inactive	Battery voltage
27	SB	Fuse 38 (With trailer tow)	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
28	O	Parking, side marker lamp RH	Output	ON	Lighting switch 1st position OFF	0V
					Lighting switch 1st position ON	Battery voltage
29	R	Parking, side marker lamp LH	Output	ON	Lighting switch 1st position OFF	0V
					Lighting switch 1st position ON	Battery voltage
30	R	Fuse 53	Output	—	Ignition switch ON or START	Battery voltage
					Ignition switch OFF or ACC	0V
32	L	Wiper low speed signal	Output	ON or START	Wiper switch OFF	0V
					Wiper switch LO or INT	Battery voltage
35	SB	Wiper high speed signal	Output	ON or START	Wiper switch OFF, LO, INT	0V
					Wiper switch HI	Battery voltage
38	B	Ground	Input	—	—	0V
39	L	CAN-H	—	ON	—	—
40	P	CAN-L	—	ON	—	—
42	SB	Oil pressure switch	Input	—	Engine running	Battery voltage
					Engine stopped	0V
43	Y	Wiper auto stop signal	Input	ON or START	Wiper switch OFF, LO, INT	Battery voltage
44	BR	Daytime running light relay 1 control (Except for Mexico)	Input	ON	Daytime running light system active	0V
					Daytime running light system inactive	Battery voltage
45	W	Horn relay control	Input	ON	When door locks are operated using keyfob (if equipped) (OFF → ON)*	Battery voltage → 0V
46	GR	Fuel pump relay control	Input	—	Ignition switch ON or START	0V
					Ignition switch OFF or ACC	Battery voltage
47	O	Throttle control motor relay control	Input	—	Ignition switch ON or START	0V
					Ignition switch OFF or ACC	Battery voltage

A
B
C
D
E
F
G
H
I
J
K
L

PCS

N
O
P

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

[IPDM E/R]

Terminal	Wire color	Signal name	Signal input/output	Measuring condition		Reference value (Approx.)
				Ignition switch	Operation or condition	
48	BR	Starter relay (inhibit switch)	Input	ON or START	Selector lever in "P" or "N"	0V
					Selector lever any other position	Battery voltage
49	V	Illumination	Output	ON	Lighting switch must be in the 1st position	OFF Battery voltage
						ON
50	L	Front fog lamp LH	Output	ON	Fog lamp switch	OFF Battery voltage
						ON
51	Y	Front fog lamp RH	Output	ON	Fog lamp switch	OFF Battery voltage
						ON
52	L	LH low beam head-lamp	Output	—	Lighting switch in 2nd position	Battery voltage
54	V	RH low beam head-lamp (USA)	Output	—	Lighting switch in 2nd position	Battery voltage
55	R	LH high beam head-lamp	Output	—	Lighting switch in 2nd position and placed in HIGH or PASS position	Battery voltage
56	Y	RH high beam head-lamp (Canada) Daytime running light relay 2 (USA)	Output	—	Lighting switch in 2nd position and placed in HIGH or PASS position	Battery voltage
57	R	Trailer tow relay 1 (With trailer tow) License plate and tail lamps (without trailer tow)	Output	ON	Lighting switch 1st position	OFF Battery voltage
						ON
59	B	Ground	Input	—	—	0V
60	R	Rear window defogger relay	Output	ON or START	Rear defogger switch ON	Battery voltage
					Rear defogger switch OFF	0V
61	BR	Fuse 32 (With trailer tow)	Output	OFF	—	Battery voltage

*: When horn reminder is ON

Fail Safe

INFOID:0000000012519581

CAN COMMUNICATION CONTROL

When CAN communication with ECM and BCM is impossible, IPDM E/R performs fail-safe control. After CAN communication recovers normally, it also returns to normal control.

If No CAN Communication Is Available With ECM

Control part	Fail-safe in operation
Cooling fan	<ul style="list-style-type: none"> Turns ON the cooling fan relay-2 when the ignition switch is turned ON Turns OFF the cooling fan relay-2 when the ignition switch is turned OFF

If No CAN Communication Is Available With BCM

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

[IPDM E/R]

Control part	Fail-safe in operation
Headlamp	<ul style="list-style-type: none"> • Turns ON the headlamp low relay when the ignition switch is turned ON • Turns OFF the headlamp low relay when the ignition switch is turned OFF • Headlamp high relay OFF
<ul style="list-style-type: none"> • Side marker lamps • Parking lamps • License plate lamps • Tail lamps 	<ul style="list-style-type: none"> • Turns ON the tail lamp relay when the ignition switch is turned ON • Turns OFF the tail lamp relay when the ignition switch is turned OFF
Front wiper	<ul style="list-style-type: none"> • The status just before activation of fail-safe control is maintained until the ignition switch is turned OFF while the front wiper is operating at LO or HI speed. • The wiper is operated at LO speed until the ignition switch is turned OFF if the fail-safe control is activated while the front wiper is set in the INT mode and the front wiper motor is operating.
Rear window defogger	Rear window defogger relay OFF
A/C compressor	A/C relay OFF

IGNITION RELAY MALFUNCTION DETECTION FUNCTION

- IPDM E/R monitors the voltage at the contact circuit and excitation coil circuit of the ignition relay inside it.
- IPDM E/R judges the ignition relay error if the voltage differs between the contact circuit and the excitation coil circuit.
- If the ignition relay cannot turn OFF due to contact seizure, it activates the tail lamp relay for 10 minutes to alert the user to the ignition relay malfunction when the ignition switch is turned OFF.

Ignition switch	Ignition relay	Tail lamp relay
ON	ON	—
OFF	OFF	—

NOTE:

The tail lamp turns OFF when the ignition switch is turned ON.

FRONT WIPER CONTROL

IPDM E/R detects front wiper stop position by a front wiper auto stop signal.

When a front wiper auto stop signal is in the conditions listed below, IPDM E/R stops power supply to wiper after repeating a front wiper 10 second activation and 20 second stop five times.

Ignition switch	Front wiper switch	Auto stop signal
ON	OFF	Front wiper stop position signal cannot be input for 10 seconds.
	ON	The signal does not change for 10 seconds.

NOTE:

This operation status can be confirmed on the IPDM E/R “DATA MONITOR” that displays “Block” for the item “WIP PROT” while the wiper is stopped.

STARTER MOTOR PROTECTION FUNCTION

IPDM E/R turns OFF the starter control relay to protect the starter motor when the starter control relay remains active for 90 seconds.

DTC Index

INFOID:000000012519582

CONSULT display	Fail-safe	TIME ^{NOTE}		Refer to
No DTC is detected. Further testing may be required.	—	—	—	—
U1000: CAN COMM CIRCUIT	×	CRNT	1 – 39	PCS-23

NOTE:

The details of TIME display are as follows.

- CRNT: The malfunctions that are detected now

A

B

C

D

E

F

G

H

I

J

K

L

PCS

N

O

P

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

[IPDM E/R]

< ECU DIAGNOSIS INFORMATION >

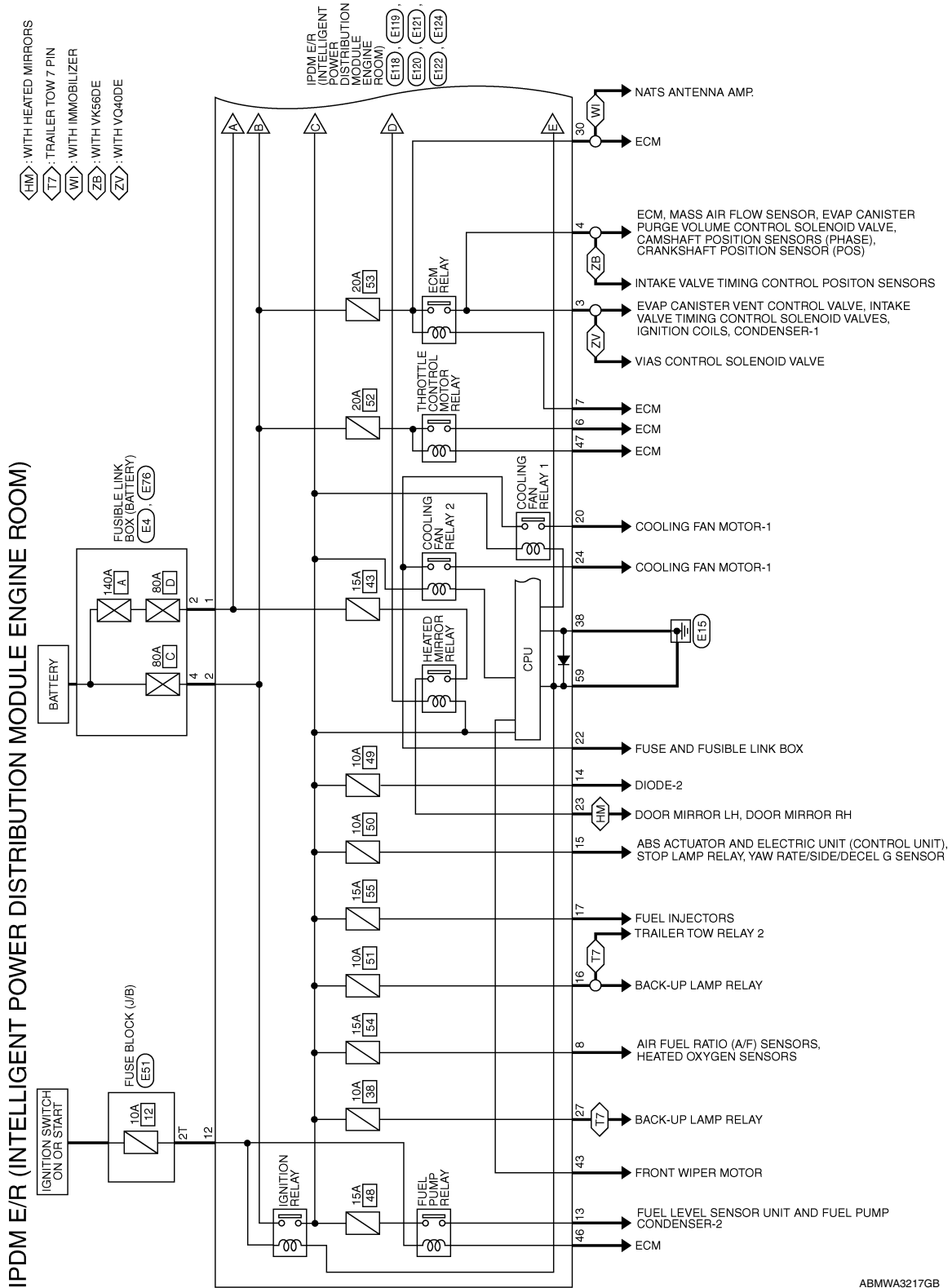
- 1 - 39: The number is indicated when it is normal at present and a malfunction was detected in the past. It increases like 0 → 1 → 2 ··· 38 → 39 after returning to the normal condition whenever IGN OFF → ON. It is fixed to 39 until the self-diagnosis results are erased if it is over 39. It returns to 0 when a malfunction is detected again in the process.

WIRING DIAGRAM

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

Wiring Diagram

INFOID:000000012519583



ABMWA3217GB

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

PCS

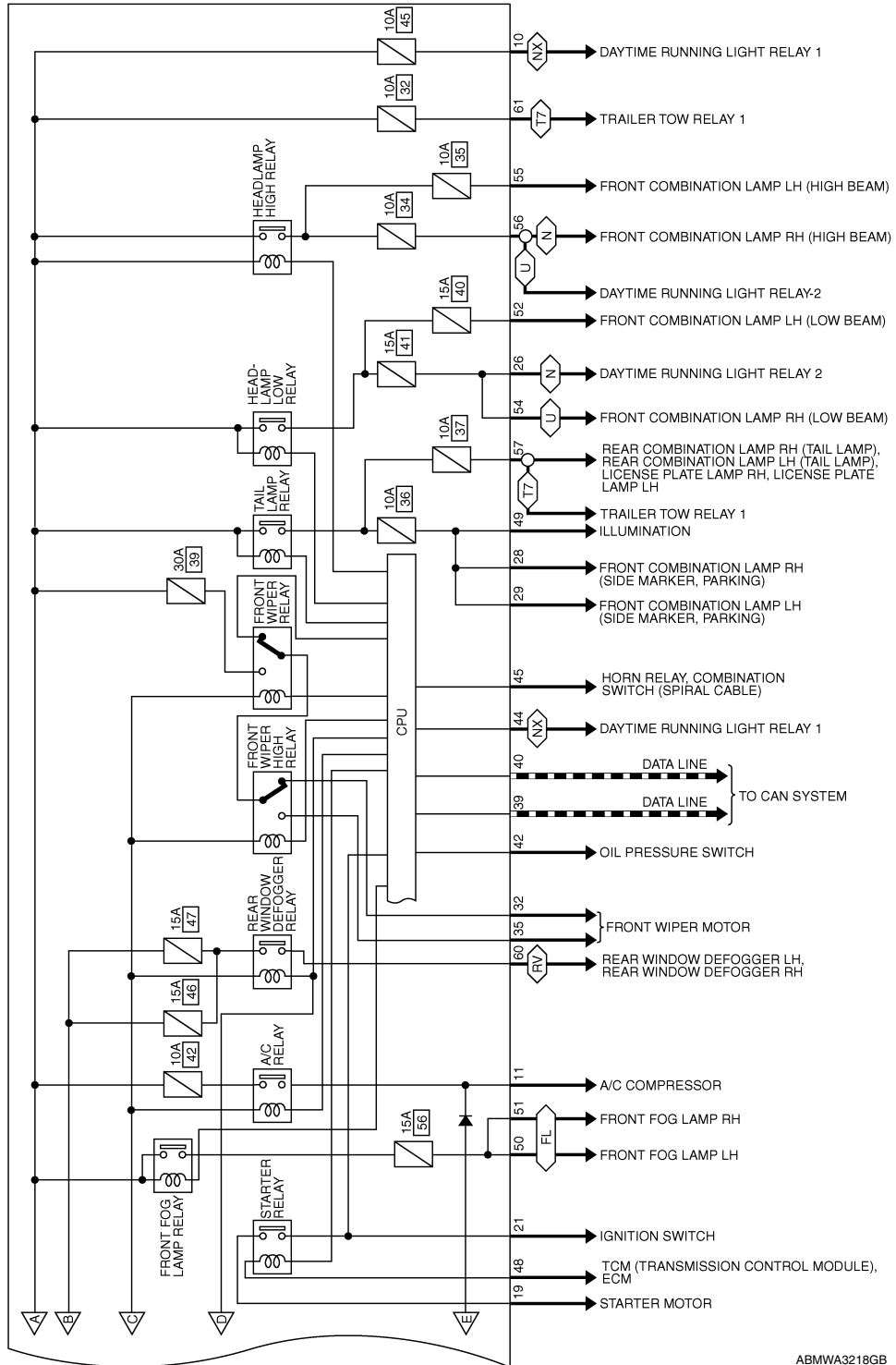
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< WIRING DIAGRAM >

[IPDM E/R]

- FL : WITH FRONT FOG LAMPS
- N : FOR CANADA
- NX : EXCEPT FOR MEXICO
- RV : WITH REAR WINDOW DEFOGGER
- T7 : TRAILER TOW 7 PIN
- U : FOR USA

IPDM E/R
(INTELLIGENT
POWER
DISTRIBUTION
MODULE
ENGINE
ROOM)
(E119), (E120),
(E121), (E122),
(E123), (E124)



ABMWA3218GB

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< WIRING DIAGRAM >

[IPDM E/R]

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) CONNECTORS

Connector No.	E4
Connector Name	FUSIBLE LINK BOX (BATTERY)
Connector Color	BROWN



Terminal No.	2	W/R	Color of Wire	Signal Name
				-

Connector No.	E51
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



Terminal No.	2T	W	Color of Wire	Signal Name
				-

Connector No.	E76
Connector Name	FUSIBLE LINK BOX (BATTERY)
Connector Color	GRAY



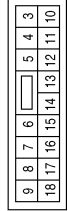
Terminal No.	4	R	Color of Wire	Signal Name
				-

Connector No.	E118
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



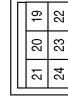
Terminal No.	1	W/R	Color of Wire	Signal Name
	2	R		F/L USM
				F/L MAIN

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	3	O	Color of Wire	Signal Name
	4	BR		IGN COIL
	5	-		ECM VB
	6	L		-
	7	W		ETC
	8	V		ECM RLY CONT
	9	-		O2 SENS IGN
	10	G		-
	11	W		DTRL RLY SUPPLY
	12	W		A/C CLUTCH
	13	R		IGN SW (IG1)
	14	Y		FUEL PUMP MTR
	15	GR		AT ECU IGN
	16	G		ABS ECU IGN
	17	W		REVERSE LAMP IGN
	18	-		INJECTOR
				-

Connector No.	E120
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	19	W	Color of Wire	Signal Name
	20	Y		STARTER MOTOR
	21	Y		MOTOR FAN 1
	22	G		IGN SW (ST)
	23	G		F/L MOTOR FAN
	24	W		HEATED MIRROR
				MOTOR FAN 2

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


PCS

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< WIRING DIAGRAM >

[IPDM E/R]


Connector No.	E123
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BROWN



51	50	49
56	55	54
53	52	

Terminal No.	Color of Wire	Signal Name
49	V	ILLUMINATION
50	L	FR FOG LAMP LH
51	Y	FR FOG LAMP RH
52	L	HEAD/L LO LH
53	-	-
54	V	HEAD/L LO RH
55	R	HEAD/L HI LH
56	Y	HEAD/L HI RH

Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE




42	41	40	38	37
48	47	46	45	44
43				

Terminal No.	Color of Wire	Signal Name
37	-	-
38	B	GND (SIGNAL)
39	L	CAN-H
40	P	CAN-L
41	-	-
42	SB	OIL PRESSURE SW
43	Y	AUTO STOP SW
44	BR	DTRL RLY DRIVE
45	W	HORN RLY CONT
46	GR	FUEL RLY CONT
47	O	ETC RLY CONT
48	BR	NPSW

Terminal No.	Color of Wire	Signal Name
59	B	GND (POWER)
60	R	RR DEF
61	BR	TRAIL RLY SUPPLY
62	-	-

Connector No.	E121
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BROWN



29	28	27	26	25
36	35	34	33	32
31	30			

Terminal No.	Color of Wire	Signal Name
25	-	-
26	R	LEVELIZER
27	SB	TTOW REV LAMP
28	O	CLEARANCE/L RH
29	R	CLEARANCE/L LH
30	R	ECM BAT
31	-	-
32	L	FR WIPER LO
33	-	-
34	-	-
35	SB	FR WIPER HI
36	-	-

Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



59	58	57
62	61	60

Terminal No.	Color of Wire	Signal Name
57	R	TAIL
58	-	-

ABMIA7375GB

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[IPDM E/R]

DTC/CIRCUIT DIAGNOSIS

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000012519584

Refer to [LAN-7, "CAN COMMUNICATION SYSTEM : System Description"](#).

DTC Logic

INFOID:0000000012519585

DTC DETECTION LOGIC

DTC	CONSULT display description	DTC Detection Condition	Possible cause
U1000	CAN COMM CIRCUIT	When IPDM E/R cannot communicate CAN communication signal continuously for 2 seconds or more	In CAN communication system, any item (or items) of the following listed below is malfunctioning. <ul style="list-style-type: none">• Receiving (ECM)• Receiving (BCM)• Receiving (combination meter)• Receiving (TCM)

DTC CONFIRMATION PROCEDURE

Diagnosis Procedure

INFOID:0000000012519586

1. PERFORM SELF DIAGNOSTIC

1. Turn ignition switch ON and wait for 2 seconds or more.
2. Check "SELF-DIAG RESULTS" of IPDM E/R.

Is "CAN COMM CIRCUIT" displayed?

- YES >> Refer to [LAN-16, "Trouble Diagnosis Flow Chart"](#).
NO >> Refer to [GI-43, "Intermittent Incident"](#).

A
B
C
D
E
F
G
H
I
J
K
L

PCS

N
O
P

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[IPDM E/R]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000012519587

Regarding Wiring Diagram information, refer to [PCS-19. "Wiring Diagram"](#).

1. CHECK FUSE AND FUSIBLE LINKS

Check that the following IPDM E/R fuses or fusible link are not blown.

Terminal No.	Signal name	Fuse and fusible link Nos.
1	Battery	A, D
2	Battery	C
12	Ignition switch ON or START	12

Is the fuse blown?

- YES >> Replace the blown fuse or fusible link after repairing the affected circuit.
NO >> GO TO 2

2. CHECK BATTERY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R.
3. Check voltage between IPDM E/R connectors and ground.

Terminals		(-)	Ignition switch position		
(+)			OFF	ON	START
Connector	Terminal				
E118	1	Ground	Battery voltage	Battery voltage	Battery voltage
	2		Battery voltage	Battery voltage	Battery voltage
E119	12		0V	Battery voltage	Battery voltage

Is the measurement value normal?

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

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between IPDM E/R connectors and ground.

IPDM E/R		Ground	Continuity
Connector	Terminal		
E122	38		Yes
E124	59		

Does continuity exist?

- YES >> Inspection End.
NO >> Repair or replace harness.

REMOVAL AND INSTALLATION

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

Removal and Installation

INFOID:0000000012519588

CAUTION:

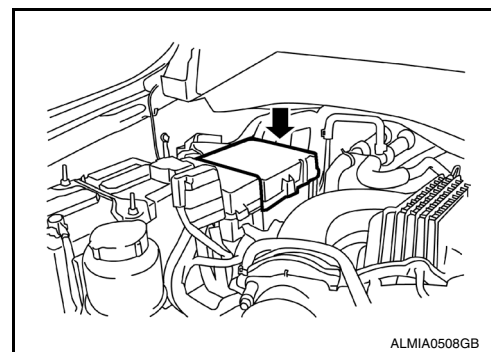
IPDM E/R integrated relays are not serviceable parts, and must not be removed from the unit.

NOTE:

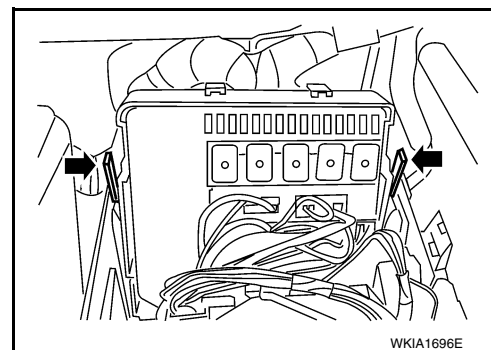
VQ40DE model shown, VK56DE model is similar.

REMOVAL

1. Disconnect the negative battery terminal.
2. Remove the IPDM E/R upper cover.



3. Release the two clips and pull the IPDM E/R up from the case.
4. Disconnect the harness connectors from the IPDM E/R and remove.



INSTALLATION

Installation is in the reverse order of removal.

A
B
C
D
E
F
G
H
I
J
K
L

PCS