

SECTION PCS

POWER CONTROL SYSTEM

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

CONTENTS

IPDM E/R		B2099 IGNITION RELAY OFF STUCK	14
FUNCTION DIAGNOSIS	2	Description	14
RELAY CONTROL SYSTEM	2	DTC Logic	14
System Diagram	2	Diagnosis Procedure	14
System Description	3	POWER SUPPLY AND GROUND CIRCUIT	15
Component Parts Location	4	Diagnosis Procedure	15
SIGNAL BUFFER SYSTEM	5	ECU DIAGNOSIS	16
System Diagram	5	IPDM E/R (INTELLIGENT POWER DISTRI-	
System Description	5	BUTION MODULE ENGINE ROOM)	16
Component Parts Location	5	Reference Value	16
POWER CONSUMPTION CONTROL SYS-		Wiring Diagram - IPDM E/R -	21
TEM	6	Fail Safe	24
System Diagram	6	DTC Index	26
System Description	6	PRECAUTION	27
Component Parts Location	7	PRECAUTIONS	27
DIAGNOSIS SYSTEM (IPDM E/R)	8	Precaution for Supplemental Restraint System	
Diagnosis Description	8	(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	
CONSULT-III Function (IPDM E/R)	10	SIONER"	27
COMPONENT DIAGNOSIS	13	ON-VEHICLE REPAIR	28
U1000 CAN COMM CIRCUIT	13	IPDM E/R (INTELLIGENT POWER DISTRI-	
Description	13	BUTION MODULE ENGINE ROOM)	28
DTC Logic	13	Exploded View	28
Diagnosis Procedure	13	Removal and Installation	28

RELAY CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

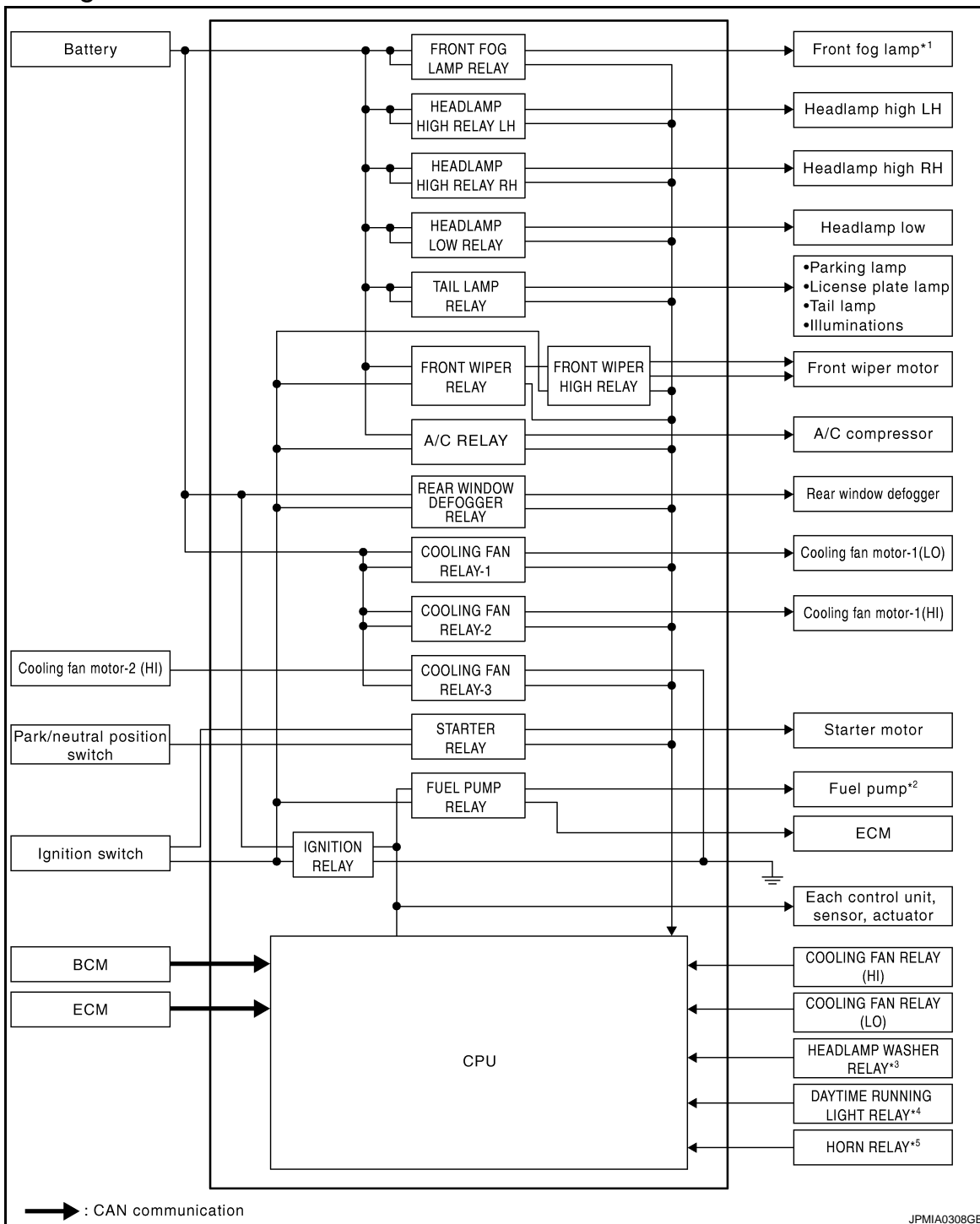
[IPDM E/R]

FUNCTION DIAGNOSIS

RELAY CONTROL SYSTEM

System Diagram

INFOID:000000001160952



NOTE:

- *1: With front fog lamp system
- *2: MR engine and QR engine models
- *3: With headlamp washer system
- *4: With daytime running light system
- *5: With vehicle security system

RELAY CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

[IPDM E/R]

System Description

INFOID:000000001160953

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
Headlamp low relay	Low beam request signal	BCM (CAN)	<ul style="list-style-type: none"> Headlamp low Aiming motor (manual aiming) 	<ul style="list-style-type: none"> EXL-13 (xenon headlamp) EXL-237 (halogen headlamp)
<ul style="list-style-type: none"> Headlamp high relay RH Headlamp high relay LH 	High beam request signal		Headlamp high	
Front fog lamp relay	Front fog light request signal	BCM (CAN)	Front fog lamp NOTE: With front fog lamp system	EXL-24
Tail lamp relay	Position light request signal	BCM (CAN)	<ul style="list-style-type: none"> Parking lamp License plate lamp Tail lamp NOTE: Without daytime running light system only	EXL-28
			Illuminations	INL-11
<ul style="list-style-type: none"> Front wiper relay Front wiper high relay 	Front wiper request signal	BCM (CAN)	Front wiper	WW-6
	Front wiper auto stop signal	Front wiper motor		
Rear window defogger relay	Rear window defogger switch signal	BCM (CAN)	Rear window defogger	DEF-4
Starter relay	Ignition and starter request signal	BCM (CAN)	Starter motor	<ul style="list-style-type: none"> SEC-16 (with Intelligent Key) SEC-235 (without Intelligent Key)
<ul style="list-style-type: none"> Cooling fan relay-1 Cooling fan relay-2 Cooling fan relay-3 Cooling fan relay-4 Cooling fan relay-5 	Cooling fan speed request signal	ECM (CAN)	Cooling fan	<ul style="list-style-type: none"> ECM-53 (MR20DE) ECQ-58 [QR25DE (with EURO-OBD)] ECQ-407 [QR25DE (without EURO-OBD)] ECR-49 (M9R)
A/C relay	A/C compressor request signal	ECM (CAN)	A/C compressor (magnet clutch)	HAC-8
Ignition relay	Ignition switch ON signal	Ignition switch	Each control unit, sensor, actuator and relay (Ignition power supply)	PCS-14
Headlamp washer relay NOTE: With headlamp washer system	Headlamp washer request signal	BCM (CAN)	Headlamp washer	WW-14

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

RELAY CONTROL SYSTEM

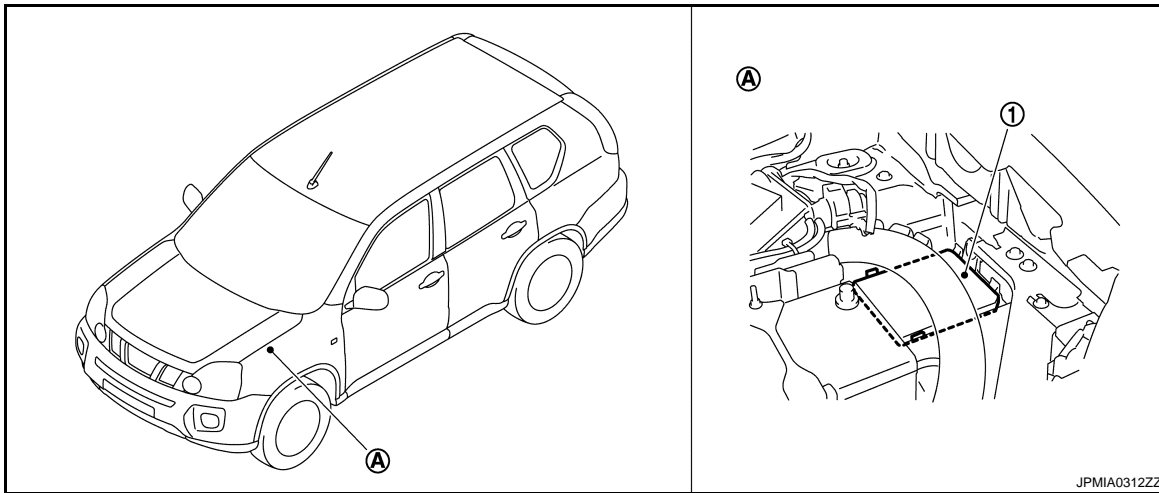
< FUNCTION DIAGNOSIS >

[IPDM E/R]

Control relay	Input/output	Transmit unit	Control part	Reference page
Horn relay NOTE: With vehicle security system	Theft warning horn request signal	BCM (CAN)	Horn	<ul style="list-style-type: none"> • SEC-21 (with Intelligent Key) • SEC-239 (without Intelligent Key)
Daytime running light relay NOTE: With daytime running light system	Daytime running light request signal	BCM (CAN)	<ul style="list-style-type: none"> • Parking lamp • License plate lamp • Tail lamp 	<ul style="list-style-type: none"> • EXL-16 (daytime running light system) • EXL-30 (parking, license plate, tail lamps system)

Component Parts Location

INFOID:000000001160954

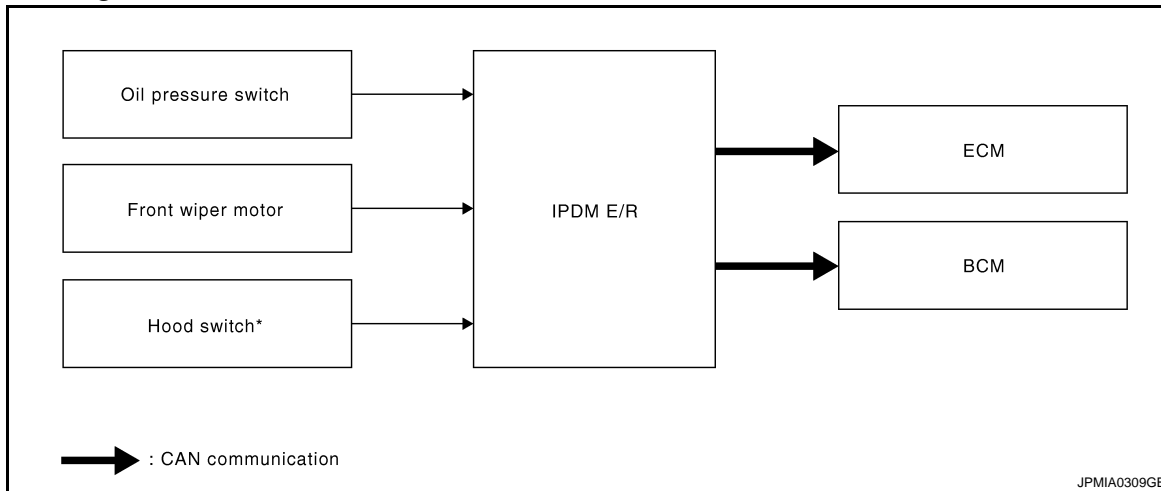


JPMIA0312ZZ

1. IPDM E/R
- A. Engine room (left side)

SIGNAL BUFFER SYSTEM

System Diagram



NOTE:

*: With vehicle security system

System Description

INFOID:000000001160956

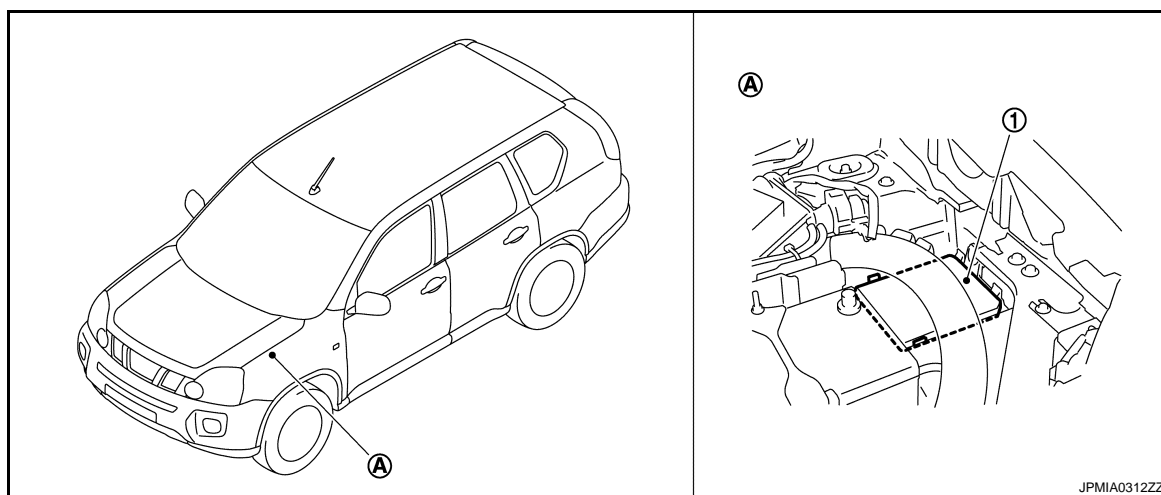
- IPDM E/R reads the status of the oil pressure switch and transmits the oil pressure switch signal to BCM and ECM* via CAN communication. Refer to [MWI-18. "WARNING LAMPS/INDICATOR LAMPS : System Diagram"](#).
- IPDM E/R receives the front wiper auto stop signal status from front wiper motor and transmits the front wiper auto stop signal to BCM via CAN communication. Refer to [WW-6. "System Diagram"](#).
- IPDM E/R reads the status of the hood switch and transmits the hood switch signal to BCM via CAN communication. Refer to [SEC-21. "System Diagram"](#) (with Intelligent Key system), [SEC-239. "System Diagram"](#) (without Intelligent Key system).

NOTE:

*: MR engine and QR engine models

Component Parts Location

INFOID:000000001303551



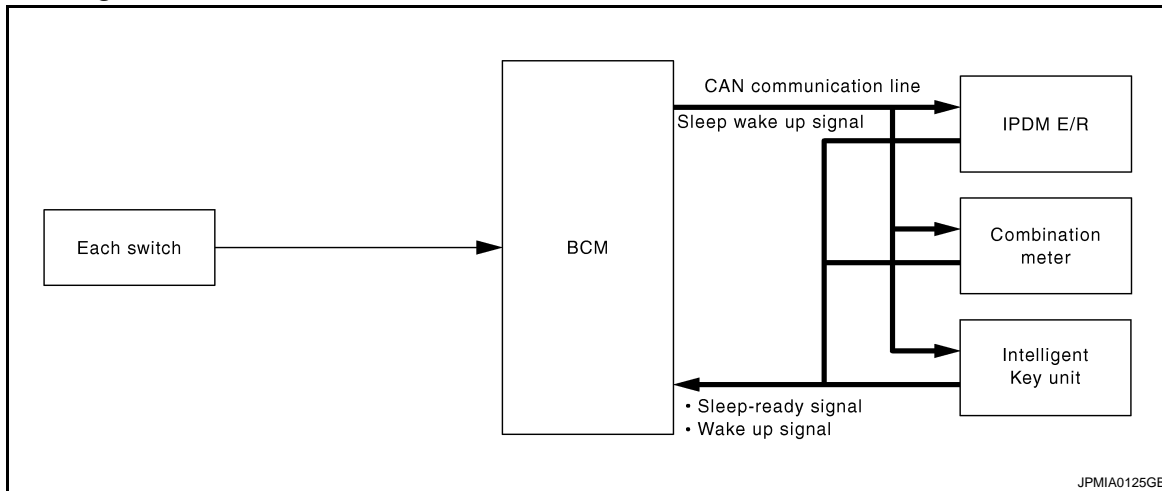
1. IPDM E/R
- A. Engine room (left side)

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

PCS

POWER CONSUMPTION CONTROL SYSTEM

System Diagram



System Description

INFOID:000000001160959

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
 - Ignition relay ON or OFF stuck detection
 - Outputting signals to actuators
 - Switches or relays operating
 - Auto active test is starting
 - Communicating with CONSULT-III
 - Hood switch status is changed (with vehicle security system)
 - 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.

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
 - The hood switch status changes.
 - An output request is received from a control unit via CAN communication.

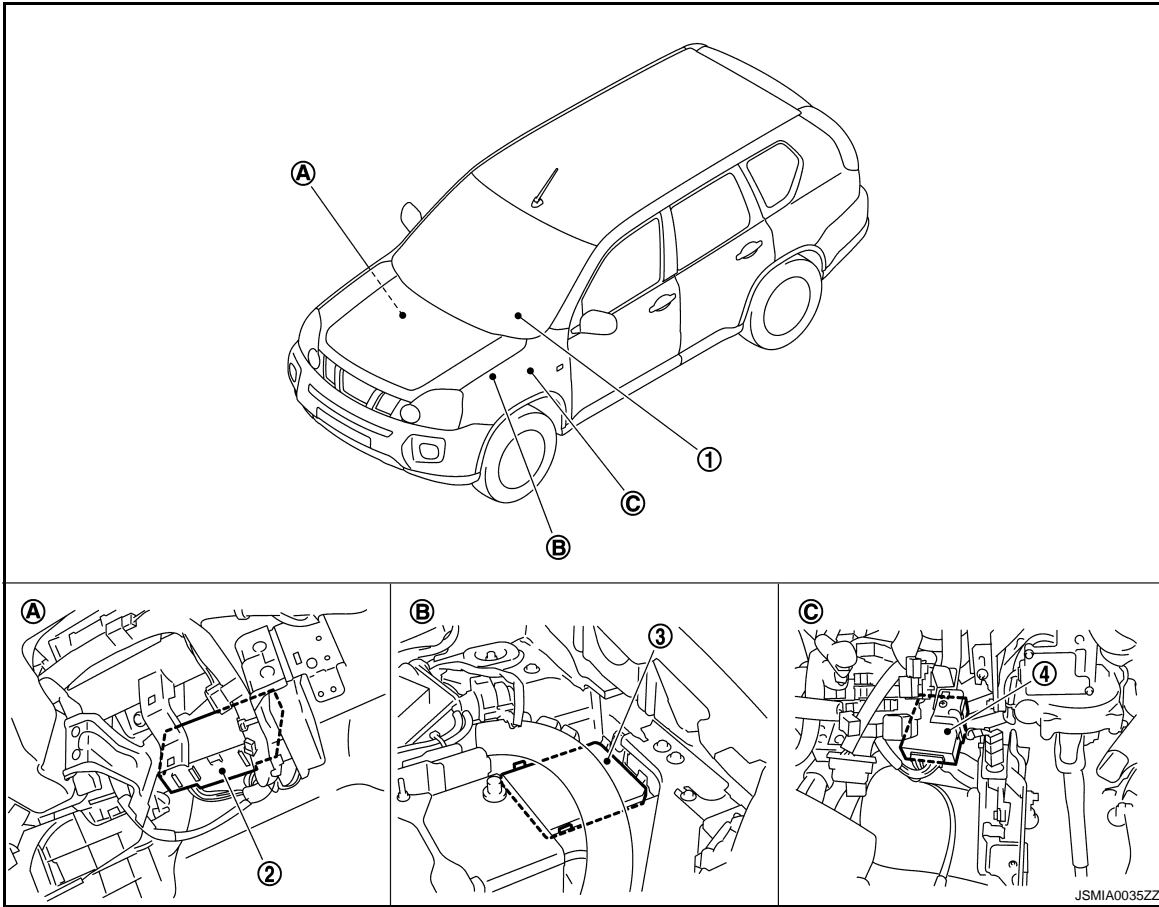
POWER CONSUMPTION CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

[IPDM E/R]

Component Parts Location

INFOID:000000001312062



- 1. Combination meter
- 4. Intelligent Key unit
- A. Over the glove box

- 2. BCM
- B. Engine room (left side)

- 3. IPDM E/R
- C. Over the instrument lower panel (driver side)

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

PCS

DIAGNOSIS SYSTEM (IPDM E/R)

Diagnosis Description

INFOID:000000001160961

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 warning lamp
- Rear window defogger
- Front wiper (LO, HI)
- Parking lamps
- License plate lamps
- Tail lamps
- Front fog lamps
- Headlamps (LO, HI)
- A/C compressor (magnet clutch)
- Cooling fan (LO, MID, HI)

Operation procedure

1. Close the hood and lift the wiper arms from the windshield. (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 driver door switch 20 times. Then turn the ignition switch OFF.

CAUTION:

Close passenger door.

4. Turn the ignition switch ON within 10 seconds. Then the horn sounds once and the auto active test starts.

NOTE:

Only a vehicle with the vehicle security system, the horn sounds.

5. The oil pressure warning lamp starts blinking when the auto active test starts.
6. After a series of the following operations is repeated 3 times, auto active test is completed.

NOTE:

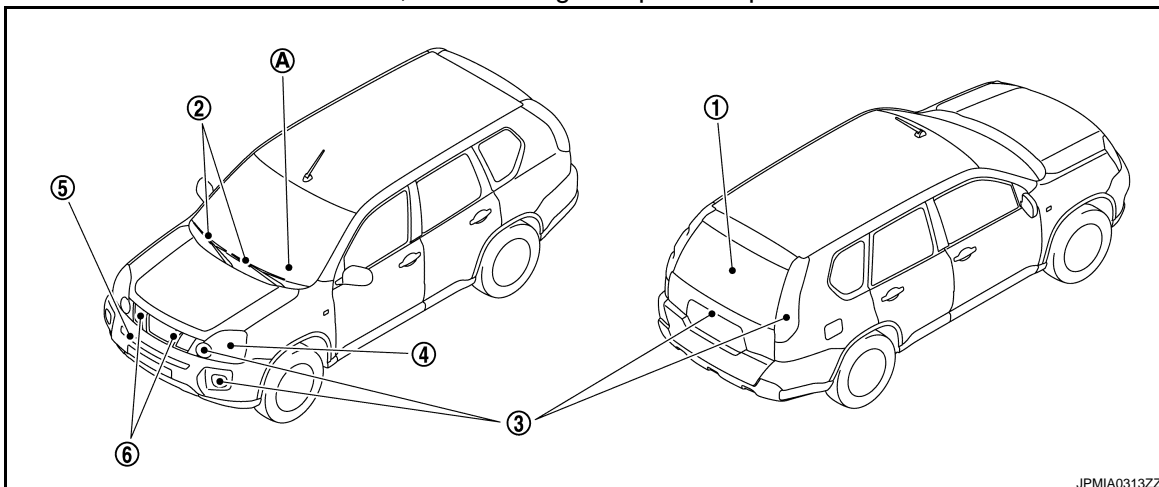
When auto active test mode has to be cancelled halfway through test, turn ignition switch OFF.

CAUTION:

- **If auto active test mode cannot be actuated, check door switch system.**
- **Never start the engine.**

Inspection in auto active test mode

When auto active test mode is actuated, the following 6 steps are repeated 3 times.



JPMIA0313ZZ

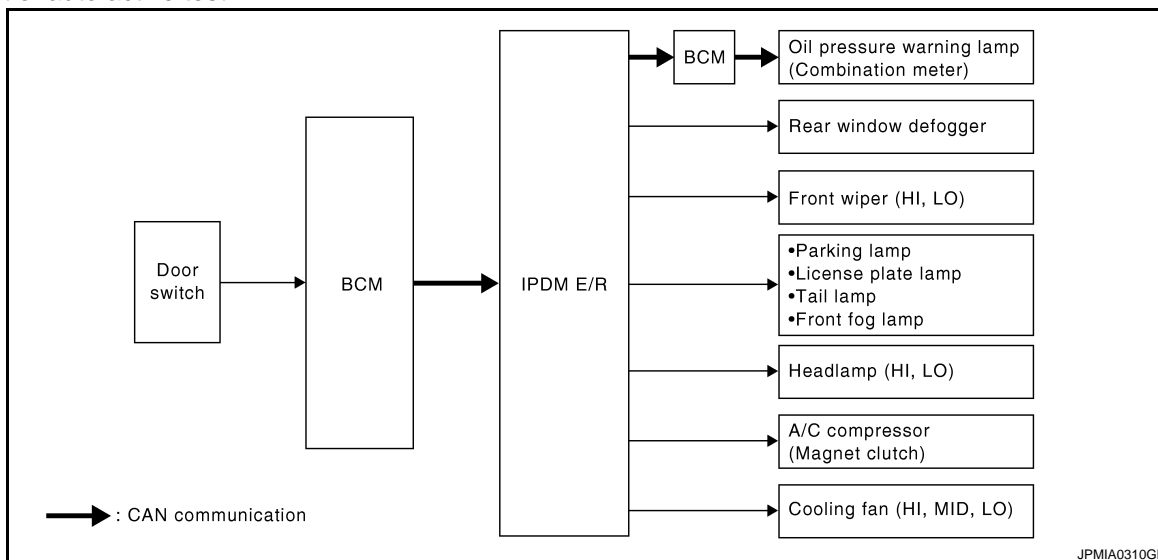
DIAGNOSIS SYSTEM (IPDM E/R)

< FUNCTION DIAGNOSIS >

[IPDM E/R]

Operation sequence	Inspection location	Operation
A	Oil pressure warning lamp	Blinks continuously during operation of auto active test.
1	Rear window defogger	10 seconds
2	Front wiper	LO for 5 seconds → HI for 5 seconds
3	<ul style="list-style-type: none"> • Parking lamps • License plate lamps • Tail lamps • Front fog lamps 	10 seconds
4	Headlamps	LO ↔ HI 5 times
5	A/C compressor (magnet clutch)	ON ↔ OFF 5 times
6	Cooling fan	LO for 5 seconds → MID for 3 seconds → HI for 2 seconds

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
Rear window defogger does not operate	Perform auto active test. Does the rear window defogger operate?	YES	BCM signal input circuit
		NO	<ul style="list-style-type: none"> • Rear window defogger • Rear window defogger ground circuit • Harness or connector between IPDM E/R and rear window defogger • IPDM E/R
Any of the following components do not operate • Parking lamps • License plate lamps • Tail lamps • Front fog lamps • Headlamps (HI, LO) • Front wiper (HI, LO)	Perform auto active test. Does the applicable system operate?	YES	BCM signal input circuit
		NO	<ul style="list-style-type: none"> • Lamp or motor • Lamp or motor ground circuit • Harness or connector between IPDM E/R and applicable system • IPDM E/R

DIAGNOSIS SYSTEM (IPDM E/R)

< FUNCTION DIAGNOSIS >

[IPDM E/R]

Symptom	Inspection contents	Possible cause
A/C compressor does not operate	Perform auto active test. Does the magnet clutch operate?	YES <ul style="list-style-type: none"> • Communication signal between BCM and auto amp. • BCM • CAN communication signal between BCM and ECM • CAN communication signal between ECM and IPDM E/R
		NO <ul style="list-style-type: none"> • Magnet clutch • Harness or connector between IPDM E/R and magnet clutch • IPDM E/R
Oil pressure warning lamp does not operate	Perform auto active test. Does the oil pressure warning lamp blink?	YES <ul style="list-style-type: none"> • Harness or connector between IPDM E/R and oil pressure switch • Oil pressure switch • IPDM E/R
		NO <ul style="list-style-type: none"> • CAN communication signal between IPDM E/R and BCM • CAN communication signal between BCM and combination meter • Combination meter
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-2 power supply circuit • Cooling fan motor-1 ground circuit • Cooling fan relay-4 or cooling fan relay-5 power supply circuit • Cooling fan relay-5 ground circuit • Harness or connector between IPDM E/R and cooling fan motor • Harness or connector between IPDM E/R, and cooling fan relay-4 or cooling fan relay-5 • Harness or connector between cooling fan motor-2, and cooling fan relay-4 or cooling fan relay-5 • Cooling fan relay-4 or cooling fan relay-5 • Cooling fan motor • IPDM E/R

CONSULT-III Function (IPDM E/R)

INFOID:000000001160962

APPLICATION ITEM

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

Diagnosis mode	Description
Self Diagnostic Result	Displays the diagnosis results judged by IPDM E/R.
Data Monitor	Displays the real-time input/output data from IPDM E/R input/output data.
Active Test	IPDM E/R can provide a drive signal to electronic components to check their operations.
CAN Diag Support MNTR	The results of transmit/receive diagnosis of CAN communication can be read.

SELF DIAGNOSTIC

Refer to [PCS-26, "DTC Index"](#).

DATA MONITOR

Monitor item

DIAGNOSIS SYSTEM (IPDM E/R)

< FUNCTION DIAGNOSIS >

[IPDM E/R]

Monitor Item [Unit]	MAIN SIGNALS	Description	A
MOTOR FAN REQ [1 - 4]	×	Displays the value of the cooling fan speed signal received from ECM via CAN communication.	B
AC COMP REQ [Off/On]	×	Displays the status of the A/C compressor request signal received from ECM via CAN communication.	C
TAIL&CLR REQ [Off/On]	×	Displays the status of the position light request signal received from BCM via CAN communication.	D
HL LO REQ [Off/On]	×	Displays the status of the low beam request signal received from BCM via CAN communication.	E
HL HI REQ [Off/On]	×	Displays the status of the high beam request signal received from BCM via CAN communication.	F
FR FOG REQ [Off/On]	×	Displays the status of the front fog light request signal received from BCM via CAN communication. NOTE: This item is monitored only the vehicle with front fog lamp system.	G
HL WASHER REQ [Off/On]		Displays the status of the headlamp washer request signal received from BCM via CAN communication. NOTE: This item is monitored only the vehicle with headlamp washer system.	H
FR WIP REQ [Stop/1LOW/Low/Hi]	×	Displays the status of the front wiper request signal received from BCM via CAN communication.	I
WIP AUTO STOP [STOP P/ACT P]	×	Displays the status of the front wiper auto stop signal judged by IPDM E/R.	J
WIP PROT [Off/BLOCK]	×	Displays the status of the front wiper fail-safe operation judged by IPDM E/R.	K
ST RLY REQ [Off/On]		Displays the status of the ignition and starter request signal received from BCM via CAN communication.	L
IGN RLY [Off/On]	×	Displays the status of the ignition relay judged by IPDM E/R.	PCS
RR DEF REQ [Off/On]	×	Displays the status of the rear defogger request signal received from BCM via CAN communication.	N
OIL P SW [Open/Close]		Displays the status of the oil pressure switch judged by IPDM E/R.	O
REV SW [Off/On]		NOTE: This item is indicated, but not monitored.	P
DTRL REQ [Off/On]		Displays the status of the daytime running light request signal received from BCM via CAN communication. NOTE: This item is monitored only the vehicle with daytime running light system.	
HOOD SW [Off/On]		Displays the status of the hood switch judged by IPDM E/R. NOTE: This item is monitored only the vehicle with the vehicle security system.	
THFT HRN REQ [Off/On]		Displays the status of the theft warning horn request signal received from BCM via CAN communication. NOTE: This item is monitored only the vehicle with the vehicle security system.	
HORN CHIRP [Off/On]		NOTE: This item is indicated, but not monitored.	

ACTIVE TEST

Test item

DIAGNOSIS SYSTEM (IPDM E/R)

< FUNCTION DIAGNOSIS >

[IPDM E/R]

Test item	Operation	Description
REAR DEFOGGER	Off	OFF
	On	Operates the rear window defogger relay.
FRONT WIPER	Off	OFF
	Lo	Operates the front wiper relay.
	Hi	Operates the front wiper relay and front wiper high relay.
MOTOR FAN	1	OFF
	2	Operates the cooling fan relay (LO operation).
	3	Operates the cooling fan relay (MID operation).
	4	Operates the cooling fan relay (HI operation).
HEAD LAMP WASHER	On	Operates the headlamp washer relay for 1 second.
EXTERNAL LAMPS	Off	OFF
	TAIL	Operates the tail lamp relay and the daytime running light relay. NOTE: Daytime running light relay is with daytime running light system only.
	Lo	Operates the headlamp low relay.
	Hi	Operates the headlamp low relay and ON/OFF the headlamp high relay at 4 seconds intervals.
	Fog	Operates the front fog lamp relay. NOTE: This item can test only the vehicle with front fog lamp system.
HORN	On	Operates horn relay for 20 ms. NOTE: This item can test only the vehicle with vehicle security system.

COMPONENT DIAGNOSIS

U1000 CAN COMM CIRCUIT

Description

INFOID:000000001160963

CAN (Controller Area Network) is a serial communication line for real time applications. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicle is equipped with many electronic control unit, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H, CAN-L) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Signal Chart. Refer to [LAN-25, "CAN Communication Signal Chart"](#).

DTC Logic

INFOID:000000001160964

DTC DETECTION LOGIC

DTC	CONSULT-III 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.	Any item (or items) of the following listed below is malfunctioning in CAN communication system. <ul style="list-style-type: none"> Transmission Receiving (ECM) Receiving (BCM)

Diagnosis Procedure

INFOID:000000001160965

1. PERFORM SELF DIAGNOSTIC

1. Turn ignition switch ON and wait for 2 seconds or more.
2. Check "Self Diagnostic Result".

Is "CAN COMM CIRCUIT" displayed?

- YES >> Refer to [LAN-13, "Trouble Diagnosis Flow Chart"](#).
 NO >> Refer to [GI-39, "Intermittent Incident"](#).

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

B2099 IGNITION RELAY OFF STUCK

< COMPONENT DIAGNOSIS >

[IPDM E/R]

B2099 IGNITION RELAY OFF STUCK

Description

INFOID:000000001160969

The ignition relay integrated in IPDM E/R is operated with ignition switch ON signal from the ignition switch.

DTC Logic

INFOID:000000001160970

DTC DETECTION LOGIC

DTC	CONSULT-III display description	DTC Detection Condition	Possible causes
B2099	IGN RELAY OFF	When CPU detects the ignition relay is OFF, it is received the ignition relay signal (ON) by CAN communication more than one second from BCM.	Ignition relay

Diagnosis Procedure

INFOID:000000001160971

1. PERFORM SELF DIAGNOSIS

1. Turn the ignition switch ON.
2. Select "Self Diagnostic Result" of "IPDM E/R". Erase DTC.
3. Turn ignition switch OFF.
4. Turn the ignition switch ON. Check "Self Diagnostic Result" again.

Is "IGN RELAY OFF" displayed?

- YES >> Replace IPDM E/R.
NO >> Refer to [GI-39, "Intermittent Incident"](#).

POWER SUPPLY AND GROUND CIRCUIT

< COMPONENT DIAGNOSIS >

[IPDM E/R]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000001160974

1.CHECK FUSIBLE LINK

Check that the following IPDM E/R fusible link is not blown.

Terminal No.	Signal name	Fusible link No.
1	Battery power supply	C
2		E
6		K

Is the fusible link fusing?

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

2.CHECK POWER SUPPLY CIRCUIT

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

Terminals		(-)	Voltage (Approx.)
IPDM E/R			
Connector	Terminal	Ground	Battery voltage
E9	1		
	2		
E10	6		

Is the measurement value normal?

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

3.CHECK GROUND CIRCUIT

Check continuity between IPDM E/R harness connectors and ground.

IPDM E/R		Ground	Continuity
Connector	Terminal		Exist
E11	11		Exist
E13	25		

Does continuity exist?

- YES >> INSPECTION END
NO >> Repair harness or connector.

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 >

[IPDM E/R]

ECU DIAGNOSIS

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

Reference Value

INFOID:000000001160975

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 - 4
AC COMP REQ	Engine running	A/C switch OFF	Off
		A/C switch ON (Compressor is operating)	On
TAIL&CLR REQ	Lighting switch OFF		Off
	Lighting switch 1ST, 2ND or AUTO (Light is illuminated)		On
HL LO REQ	Lighting switch OFF		Off
	Lighting switch 2ND or AUTO (Light is illuminated)		On
HL HI REQ	Lighting switch OFF		Off
	Lighting switch HI (Light is illuminated)		On
FR FOG REQ	Lighting switch 2ND or AUTO (Light is illuminated)	Front fog lamp switch OFF	Off
		Front fog lamp switch ON	On
HL WASHER REQ NOTE: This item is monitored only on the vehicle with headlamp washer.	Ignition switch ON, and low beam headlamp is ON	Front washer switch OFF	Off
		Front washer switch ON (When headlamp washer is operating)	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 NOTE: Vehicle without Intelligent Key system indicates only "ON", and it does not change.	When Intelligent Key is outside the vehicle, and the push switch is pushed		Off
	When Intelligent Key is inside the vehicle, and the push switch is pushed		On
IGN RLY	Ignition switch OFF or ACC		Off
	Ignition switch ON		On
RR DEF REQ	Ignition switch ON	Rear window defogger switch OFF	Off
		Rear window defogger switch ON (Rear window defogger is operating)	On
OIL P SW	Ignition switch OFF, ACC or engine running		Open
	Ignition switch ON		Close

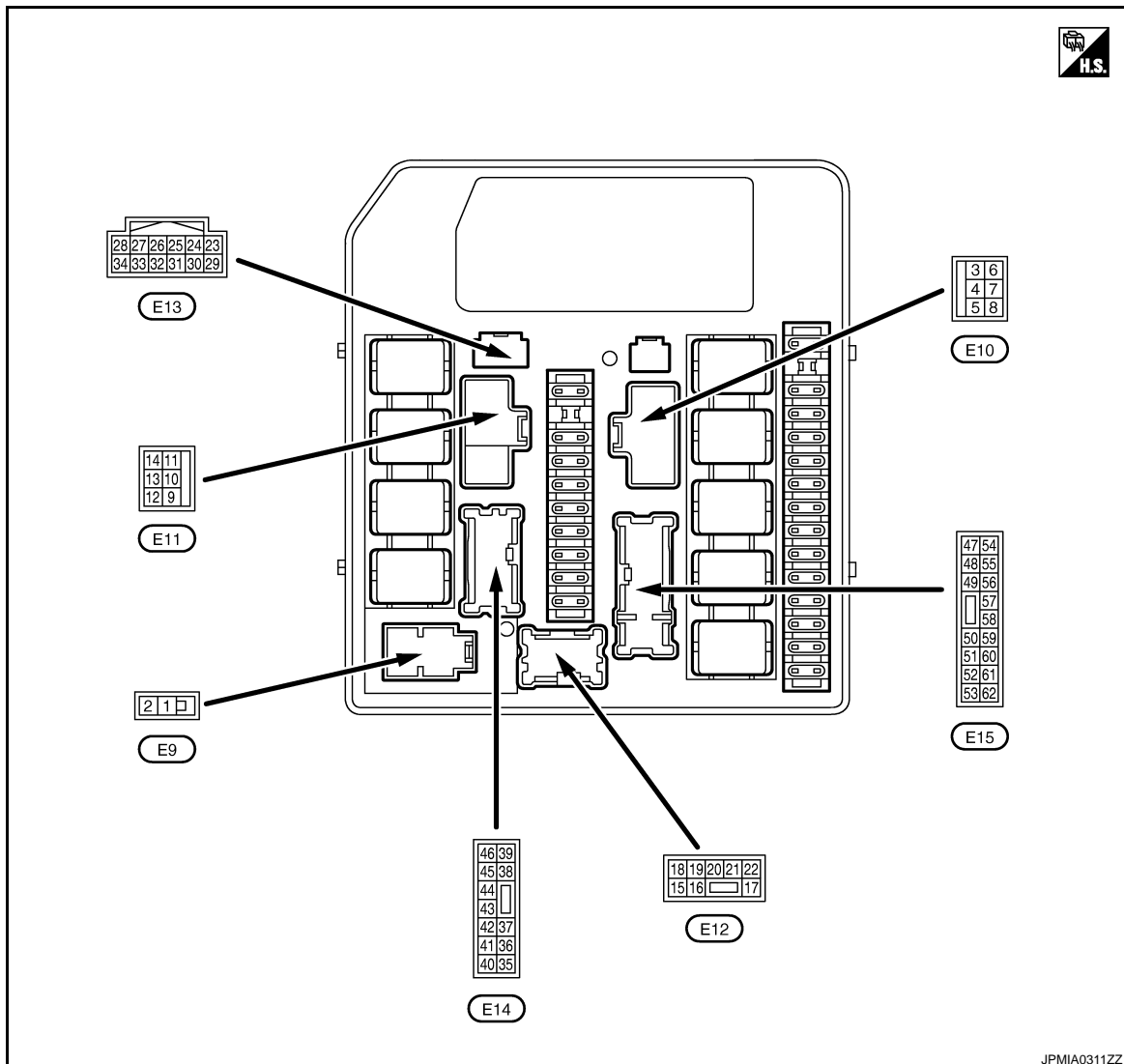
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS >

[IPDM E/R]

Monitor Item	Condition	Value/Status
REV SW	NOTE: This item is indicated, but not monitored.	Off
DTRL REQ NOTE: This item is monitored only on the vehicle with the daytime running light system.	Daytime running light system is not operated with lighting switch OFF.	Off
	Any of the condition below • Daytime running light system is operated. • Lighting switch 1ST, 2ND or AUTO (Light is illuminated)	On
HOOD SW NOTE: This item is monitored only on the vehicle with the vehicle security system.	Close the hood	Off
	Open the hood	On
THFT HRN REQ NOTE: This item is monitored only on the vehicle with the vehicle security system.	Not operation	Off
	Horn is activated with vehicle security system.	On
HORN CHIRP	NOTE: This item is indicated, but not monitored.	Off

TERMINAL LAYOUT



PHYSICAL VALUES

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 >

[IPDM E/R]

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	-	Signal name	Input/ Output			
1 (G)	Ground	Battery power supply	Input	Ignition switch OFF		Battery voltage
2 (R)	Ground	Battery power supply	Input	Ignition switch OFF		Battery voltage
3 (O)*1 (BR)*2	Ground	Starter relay power supply	Output	When engine is clanking		Battery voltage
				When engine is not clanking		0 V
4 (W)	Ground	Cooling fan relay-1 power supply	Output	Cooling fan operation	OFF	0 V
					MID or HI	Battery voltage
5 (R)	Ground	Ignition switch START	Input	Ignition switch OFF, ACC or ON		0 V
				Ignition switch START		Battery voltage
6 (BR)	Ground	Battery power supply (Cooling fan relay)	Input	Ignition switch OFF		Battery voltage
7 (P)	Ground	Cooling fan motor-2 (HI) ground	—	Cooling fan operation	OFF	Battery voltage
					HI	0 V
8 (G)	Ground	Cooling fan relay-2 power supply	Output	Cooling fan operation	OFF	0 V
					HI	Battery voltage
11 (B)	Ground	Ground	—	Ignition switch ON		0 V
12 (O)*3 (G)*4	Ground	Rear window defogger relay power supply	Output	Ignition switch ON	Rear window defogger switch OFF	0 V
					Rear window defogger switch ON	Battery voltage
15*5 (SB)	Ground	Daytime running light relay control	Output	<ul style="list-style-type: none"> • Parking lamp • License plate lamp • Tail lamp 	Turn off	Battery voltage
					Turn on	0 V
16*6 (Y)	Ground	Front fog lamp (LH)	Output	Lighting switch 1ST	Front fog lamp switch OFF	0 V
					Front fog lamp switch ON	Battery voltage
17*6 (W)	Ground	Front fog lamp (RH)	Output	Lighting switch 1ST	Front fog lamp switch OFF	0 V
					Front fog lamp switch ON	Battery voltage
18 (L)	Ground	Headlamp LO (LH)	Output	Lighting switch OFF		0 V
				Lighting switch 2ND		Battery voltage
19*7 (R)	Ground	Headlamp aiming motor power supply	Output	Lighting switch OFF		0 V
				Lighting switch 2ND		Battery voltage
20 (SB)	Ground	Headlamp LO (RH)	Output	Lighting switch OFF		0 V
				Lighting switch 2ND		Battery voltage
21 (G)	Ground	Headlamp HI (LH)	Output	Lighting switch OFF		0 V
				<ul style="list-style-type: none"> • Lighting switch 2ND and HI • lighting switch PASS 		Battery voltage
22 (LG)	Ground	Headlamp HI (RH)	Output	Lighting switch OFF		0 V
				<ul style="list-style-type: none"> • Lighting switch 2ND and HI • lighting switch PASS 		Battery voltage
23 (W)	Ground	Oil pressure switch	Input	Ignition switch ON	Engine stopped	0 V
					Engine running	Battery voltage

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

< ECU DIAGNOSIS >

[IPDM E/R]

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
		Signal name	Input/ Output			
24 (Y)	Ground	Front wiper auto stop	Input	Ignition switch ON	Front wiper stop position	0 V
					Any position other than front wiper stop position	Battery voltage
25 (B)	Ground	Ground	—	Ignition switch ON		0 V
26 (P)	—	CAN-L	Input/ Output	—		—
27 (L)	—	CAN-H	Input/ Output	—		—
31 (V)	Ground	Cooling fan relay-4 control	Output	Cooling fan operation	OFF	Battery voltage
					LO	0 V
32*1 (LG)	Ground	ETC relay control	Input	After passing approximately 2 seconds or more after turning the ignition switch from ON to OFF		Battery voltage
				<ul style="list-style-type: none"> • Ignition switch ON • For approximately 2 seconds after turning ignition switch from ON to OFF 		0 V
33*1 (GR)	Ground	Fuel pump relay control	Input	Ignition switch OFF		0 V
				Ignition switch ON	Engine stopped	Battery voltage
					Engine running	0.8 V
34*8 (Y)	Ground	Hood switch	Input	Close the hood		Battery voltage
				Open the hood		0 V
35*9 (W)	Ground	Headlamp washer relay control	Output	Ignition switch ON	When headlamp washer is not operating	Battery voltage
					When headlamp washer is operating	0 V
37 (R)	Ground	Tail, license plate lamps and illuminations	Output	Lighting switch OFF		0 V
				Lighting switch 1ST		Battery voltage
38*10 (O)*1 (GR)*2	Ground	Parking lamp (LH)	Output	Lighting switch OFF		0 V
				Lighting switch 1ST		Battery voltage
39*10 (GR)	Ground	Parking lamp (RH)	Output	Lighting switch OFF		0 V
				Lighting switch 1ST		Battery voltage
40 (V)	Ground	Ignition relay power supply	Output	Ignition switch OFF or ACC		0 V
				Ignition switch ON		Battery voltage
41 (O)*1 (L)*2	Ground	Ignition relay power supply	Output	Ignition switch OFF or ACC		0 V
				Ignition switch ON		Battery voltage
42 (L)	Ground	Front wiper HI	Output	Ignition switch ON	Front wiper switch OFF	0 V
					Front wiper switch HI	Battery voltage
43 (G)	Ground	Front wiper LO	Output	Ignition switch ON	Front wiper switch OFF	0 V
					Front wiper switch LO	Battery voltage
45 (Y)	Ground	Starter relay power supply	Input	Ignition switch ON (Except M/T models)	Selector lever "P" or "N"	Battery voltage
					Selector lever in any position other than "P" or "N"	0 V
				Ignition switch ON (M/T models)		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 >

[IPDM E/R]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)	
		Signal name	Input/ Output			
+	-					
46*1 (W)	Ground	Fuel pump relay power supply	Output	<ul style="list-style-type: none"> • Ignition switch OFF or ACC • After passing approximately 1 second or more after turning the ignition switch ON 	0 V	
				<ul style="list-style-type: none"> • For approximately 1 second after turning the ignition switch ON • Engine running 	Battery voltage	
47 (BR)*1 (G)*2	Ground	ECM relay power supply	Output	After passing approximately 20 seconds or more after turning the ignition switch from ON to OFF	0 V	
				<ul style="list-style-type: none"> • Ignition switch ON • For approximately 20 seconds after turning ignition switch from ON to OFF 	Battery voltage	
48 (R)*1 (V)*2	Ground	ECM relay power supply	Output	After passing approximately 20 seconds or more after turning the ignition switch from ON to OFF	0 V	
				<ul style="list-style-type: none"> • Ignition switch ON • For approximately 20 seconds after turning ignition switch from ON to OFF 	Battery voltage	
50 (G)	Ground	Cooling fan relay-5 control	Output	Cooling fan operation	OFF	
					MID or HI	0 V
51 (W)	Ground	ECM relay control	Output	After passing approximately 20 seconds or more after turning the ignition switch from ON to OFF	Battery voltage	
				<ul style="list-style-type: none"> • Ignition switch ON • For approximately 20 seconds after turning ignition switch from ON to OFF 	0 V	
52*1 (P)	Ground	ETC relay power supply	Output	After passing approximately 2 seconds or more after turning the ignition switch from ON to OFF	0 V	
				<ul style="list-style-type: none"> • Ignition switch ON • For approximately 2 seconds after turning ignition switch from ON to OFF 	Battery voltage	
55 (O)	Ground	A/C relay power supply	Output	Engine stopped	0 V	
				Engine running	A/C switch OFF	0 V
					A/C switch ON (A/C compressor is operating)	Battery voltage
56 (L)	Ground	Ignition switch ON	Input	Ignition switch OFF or ACC	0 V	
				Ignition switch ON	Battery voltage	
57*8 (V)	Ground	Horn relay control	Output	The horn is not activated	Battery voltage	
				The horn is activated	0 V	
58 (Y)	Ground	Ignition relay power supply	Output	Ignition switch OFF or ACC	0 V	
				Ignition switch ON	Battery voltage	
59 (GR)	Ground	Ignition relay power supply	Output	Ignition switch OFF or ACC	0 V	
				Ignition switch ON	Battery voltage	
60 (SB)	Ground	Ignition relay power supply	Output	Ignition switch OFF or ACC	0 V	
				Ignition switch ON	Battery voltage	
61 (O)	Ground	ECM power supply	Output	Ignition switch OFF	Battery voltage	

*1: MR engine and QR engine models

*2: M9R engine models

*3: MR engine models

*4: QR engine and M9R engine models

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

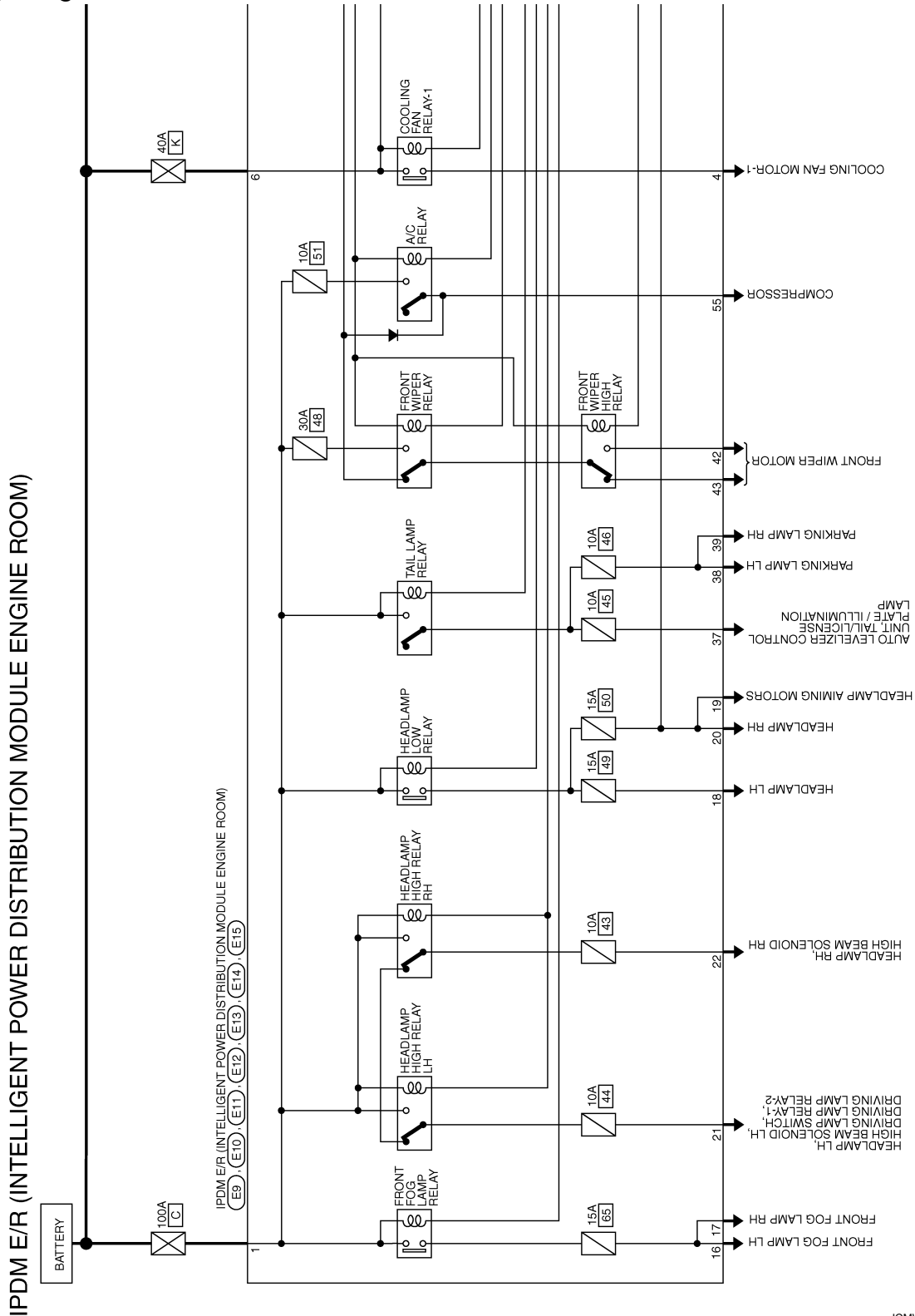
[IPDM E/R]

< ECU DIAGNOSIS >

- *5: With daytime running light system
- *6: With front fog lamp system
- *7: Halogen type headlamp
- *8: With vehicle security system
- *9: With headlamp washer system
- *10: Without daytime running light system

Wiring Diagram - IPDM E/R -

INFOID:000000001160976



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

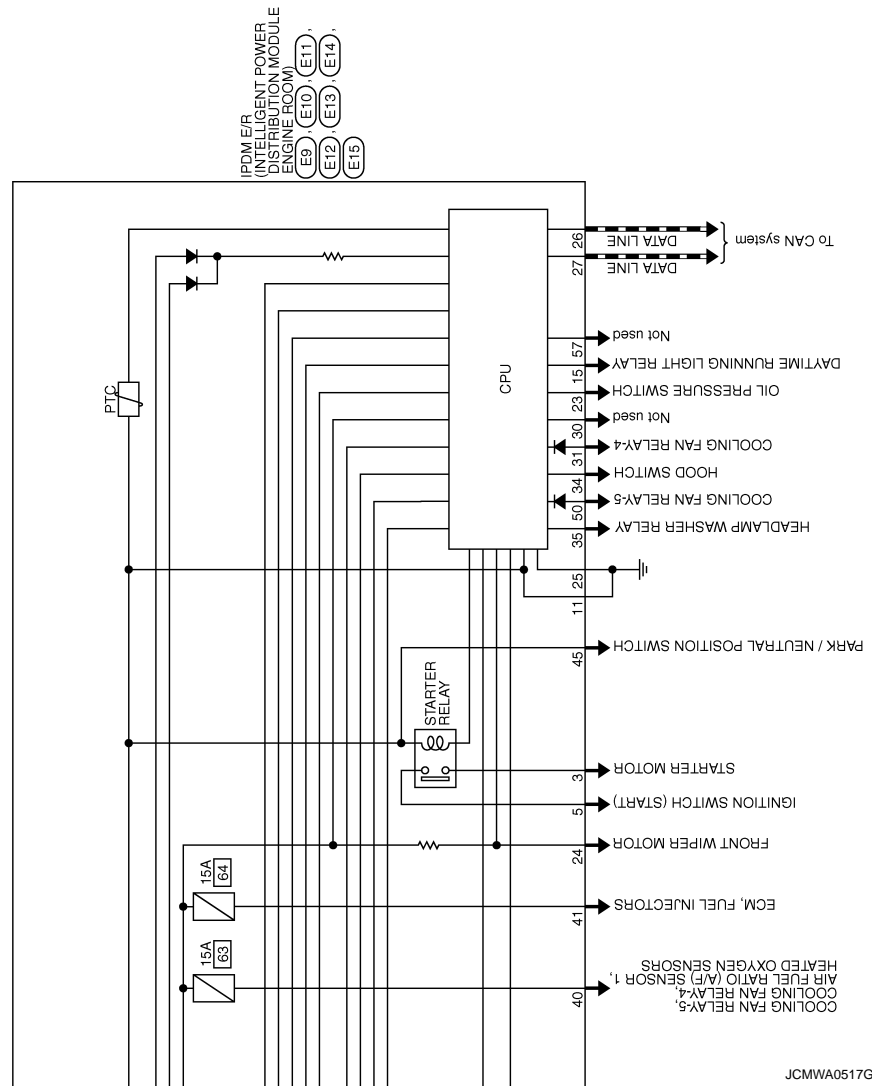
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
(E9), (E10), (E11), (E12), (E13), (E14), (E15)

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

PCS

2007/02/28

JCMWA0515GE



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 >

[IPDM E/R]

Control part	Fail-safe in operation
Cooling fan	<ul style="list-style-type: none"> The cooling fan relay-1, the cooling fan relay-2, the cooling fan relay-3 and the cooling fan relay-5 turn ON when the ignition switch is turned ON The cooling fan relay-1, the cooling fan relay-2, the cooling fan relay-3 and the cooling fan relay-5 turn OFF when the ignition switch is turned OFF Cooling fan relay-4 OFF
A/C compressor	A/C relay OFF

If no CAN communication is available with BCM

Control part	Fail-safe in operation
Headlamp	<ul style="list-style-type: none"> The headlamp low relay turns ON when the ignition switch is turned ON The headlamp low relay turns OFF when the ignition switch is turned OFF Headlamp high relay OFF
<ul style="list-style-type: none"> Parking lamps License plate lamps Tail lamps Illuminations 	<ul style="list-style-type: none"> The tail lamp relay and the daytime running light relay*¹ turn ON when the ignition switch is turned ON The tail lamp relay and the daytime running light relay*¹ turn OFF 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 front 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.
Front fog lamps	Front fog lamp relay OFF
Starter motor	Starter relay OFF
Rear window defogger	Rear window defogger relay OFF
Headlamp washer* ²	Headlamp washer relay OFF
Horn* ³	Horn relay OFF

NOTE:

- *1: With daytime running light system
- *2: With headlamp washer system
- *3: With vehicle security system

Ignition relay malfunction detection function

- IPDM E/R monitors status of ignition relay by the voltage at ignition relay contact circuit inside it.
- IPDM E/R judges that the ignition relay is error, if status of the ignition relay and ignition switch ON signal (CAN) *.
- If the ignition relay cannot turn OFF due to contact seizure, it activates the tail lamp relay and daytime running light relay* for 10 minutes to alert the user to the ignition relay malfunction when the ignition switch is turned OFF.

DTC	Ignition switch	Ignition relay	Tail lamp relay and daytime running light relay*
—	ON	ON	—
—	OFF	OFF	—
—	OFF	ON	ON (10 minutes)
B2099: IGN RLY OFF	ON	OFF	—

NOTE:

- The tail lamp relay and the daytime running light relay* are turned OFF when the ignition switch is turned ON.
- *: With daytime running light system

Front wiper control

IPDM E/R detects the front wiper stop position with the front wiper auto stop signal.

When the front wiper auto stop signal is in the conditions listed below, IPDM E/R repeats a front wiper 10 seconds operation and 20 seconds stop five times.

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

< ECU DIAGNOSIS >

[IPDM E/R]

Ignition switch	Front wiper switch	Front wiper auto stop signal
ON	OFF	The front wiper auto stop signal (stop position) cannot be input for 10 seconds.
	ON	The front wiper auto stop 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.

DTC Index

INFOID:000000001160978

CONSULT display	Fail-safe	Timing ^{NOTE}		Reference page
No DTC is detected. further testing may be required.	—	—	—	—
U1000: CAN COMM CIRCUIT	×	CRNT	PAST	PCS-13
B2099: IGN RELAY OFF	—	CRNT	PAST	PCS-14

NOTE:

The details of time display are as follows.

- CRNT: The malfunctions that are detected now.
- PAST: The number is indicated when it is normal at present and a malfunction was detected in the past.

PRECAUTION

PRECAUTIONS

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

INFOID:000000001160979

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 AIRBAG" and "SEAT BELT" of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the "SRS AIRBAG".
- 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.

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

PCS

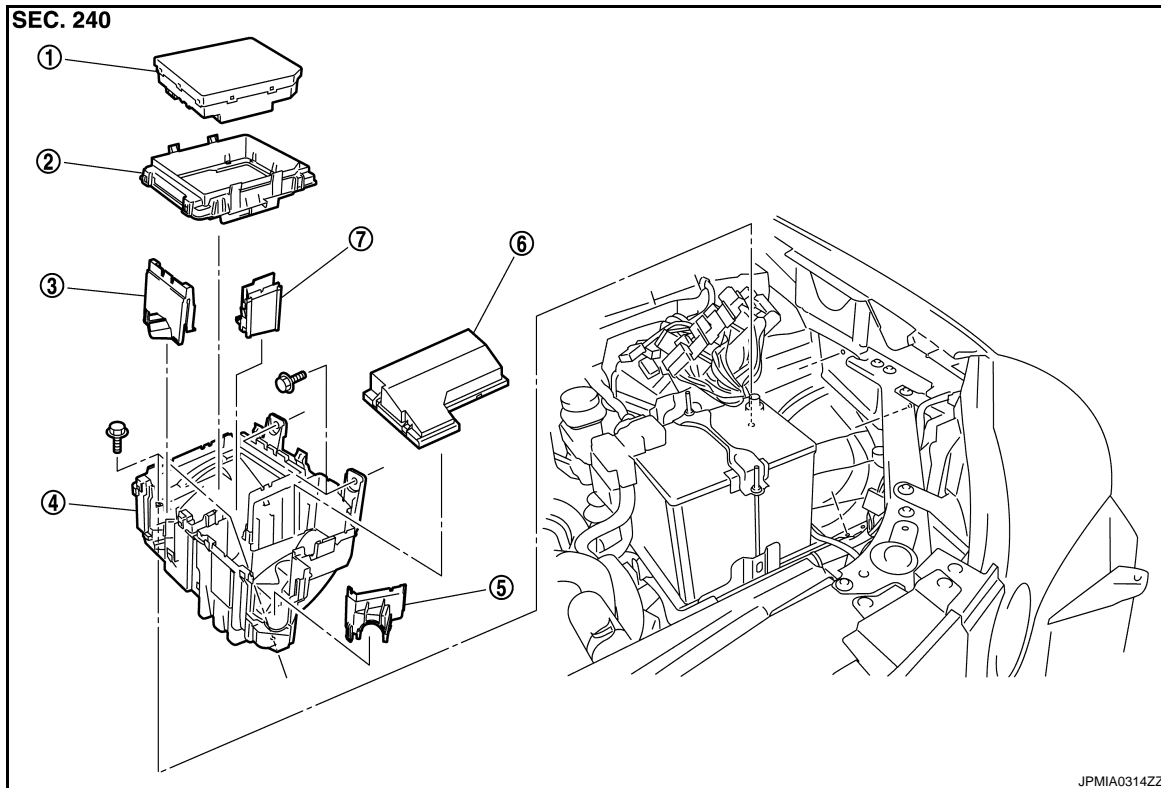
N
O
P

ON-VEHICLE REPAIR

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

Exploded View

INFOID:000000001160980



- | | | |
|---------------------|---------------------|--------------------------------------|
| 1. IPDM E/R | 2. IPDM E/R bracket | 3. IPDM E/R cover A |
| 4. IPDM E/R cover B | 5. Harness cover A | 6. Fuse and fusible link block cover |
| 7. Harness cover B | | |

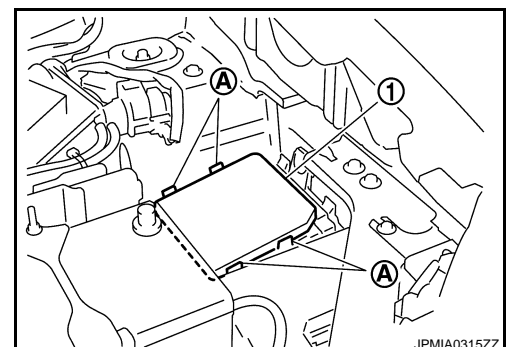
Removal and Installation

INFOID:000000001160981

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

REMOVAL

1. Remove air duct (inlet). Refer to [EM-25, "Exploded View"](#) (MR20DE), [EM-150, "Exploded View"](#) (QR25DE), [EM-263, "Exploded View"](#) (M9R).
2. Remove battery. Refer to [PG-133, "Exploded View"](#).
3. Remove IPDM E/R (1) while pushing and opening pawls (A).
4. Disconnect connectors from IPDM E/R.

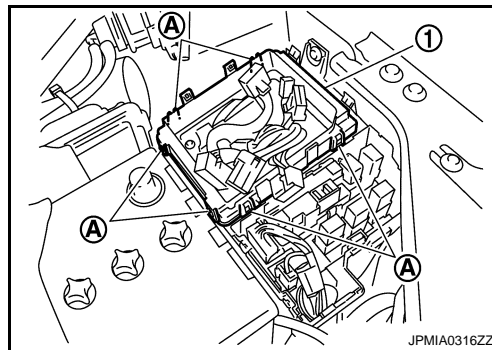


IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

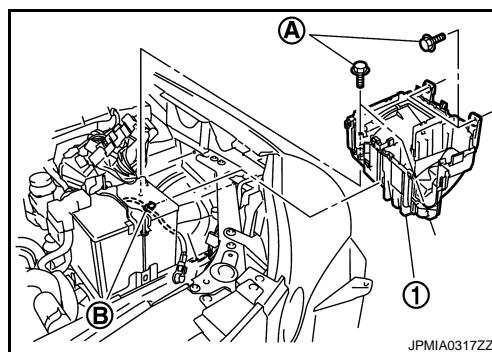
[IPDM E/R]

< ON-VEHICLE REPAIR >

5. Remove fuse and fusible link block cover.
6. Unlock all pawls (A) of IPDM E/R bracket, and remove IPDM E/R bracket (1).



7. Unlock pawls of IPDM E/R cover A, harness cover A and harness cover B, remove them.
8. Disconnect connectors connected to fuse and fusible link block upper side, and remove fuse and fusible link block.
9. Remove IPDM E/R cover B mounting bolts (A) and battery cable fixed clip (B), and remove IPDM E/R cover B (1).



INSTALLATION

Install in the reverse order of removal.

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

PCS