SECTION DMS
DRIVE MODE SYSTEM

CONTENTS

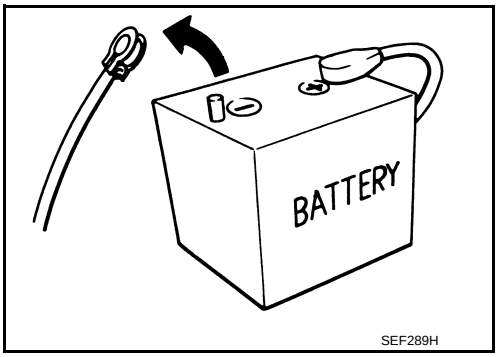
PRECAUTION

PRECAUTIONS

Precautions for Removing Battery Terminal

INFOID:0000000011010012

- With the adoption of Auto ACC function, ACC power is automatically supplied by operating the intelligent key or remote keyless entry or by opening/closing the driver side door. In addition, ACC power is supplied even after the ignition switch is turned to the OFF position, i.e. ACC power is supplied for a certain fixed time.
- When disconnecting the 12V battery terminal, turn off the ACC power before disconnecting the 12V battery terminal, observing “How to disconnect 12V battery terminal” described below.
  NOTE:
  Some ECUs operate for a certain fixed time even after ignition switch is turned OFF and ignition power supply is stopped. If the battery terminal is disconnected before ECU stops, accidental DTC detection or ECU data damage may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.



HOW TO DISCONNECT 12V BATTERY TERMINAL

Disconnect 12V battery terminal according to Instruction 1 or Instruction 2 described below.
For vehicles parked by ignition switch OFF, refer to Instruction 2.

INSTRUCTION 1

1. Open the hood.
2. Turn key switch to the OFF position with the driver side door opened.
3. Get out of the vehicle and close the driver side door.
4. Wait at least 3 minutes. For vehicle with the engine listed below, remove the battery terminal after a lapse of the specified time.

D4D engine	: 20 minutes
HRA2DDT	: 12 minutes
K9K engine	: 4 minutes
M9R engine	: 4 minutes
R9M engine	: 4 minutes
V9X engine	: 4 minutes

CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.

5. Remove 12V battery terminal.
   CAUTION:
   After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

INSTRUCTION 2 (FOR VEHICLES PARKED BY IGNITION SWITCH OFF)

1. Unlock the door with intelligent key or remote keyless entry.
   NOTE:
   At this moment, ACC power is supplied.
2. Open the driver side door.
3. Open the hood.
4. Close the driver side door.
5. Wait at least 3 minutes.

CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.

6. Remove 12V battery terminal.

CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

SYSTEM DESCRIPTION

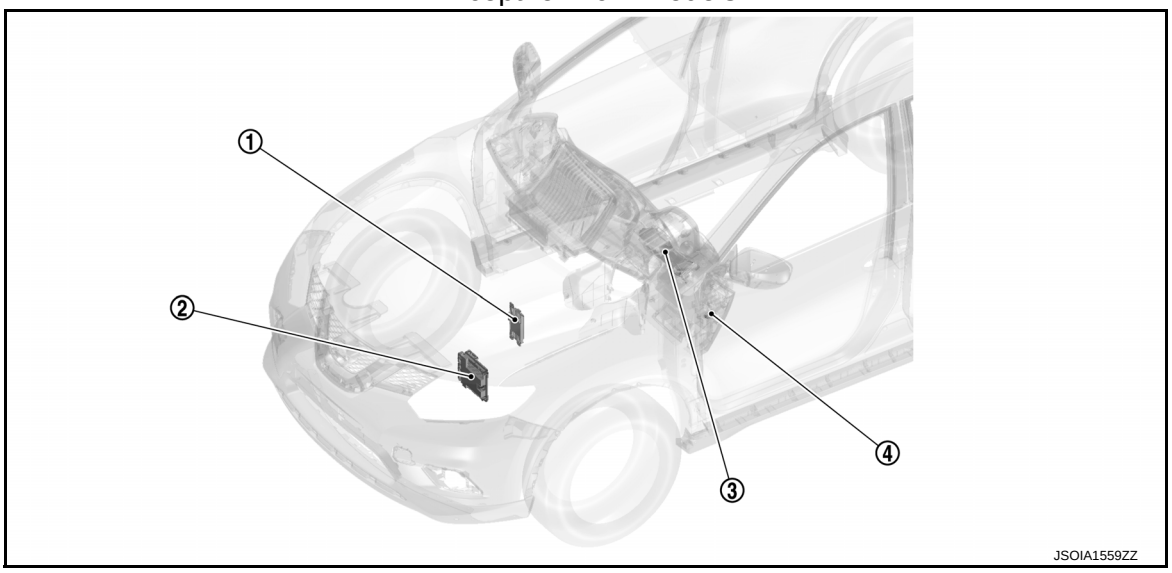
COMPONENT PARTS

Component Parts Location

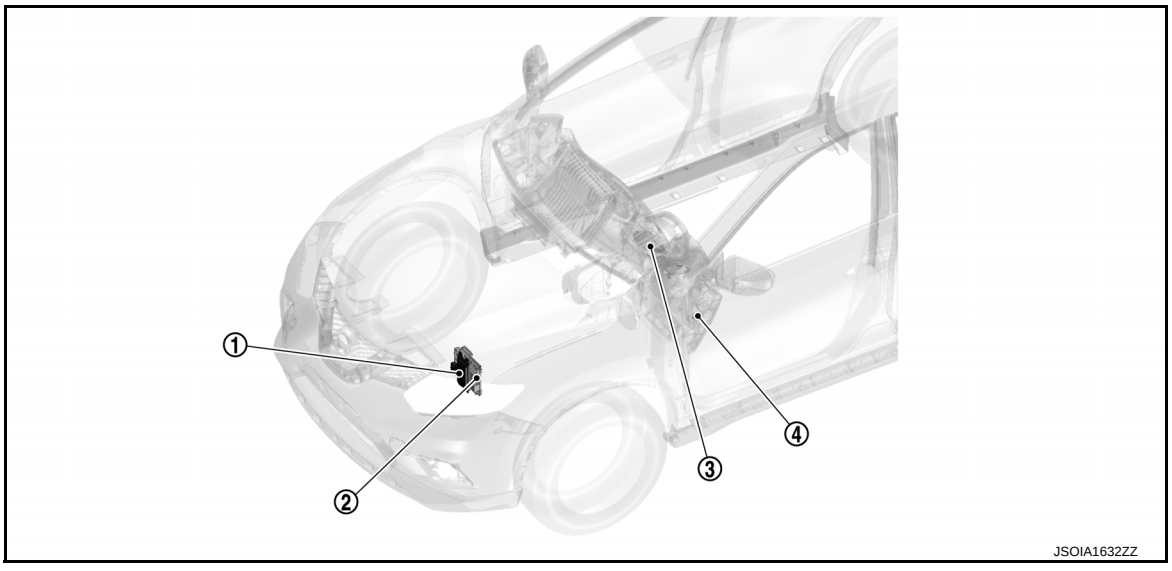
INFOID:0000000010623742

LHD MODELS

Except for R9M Models

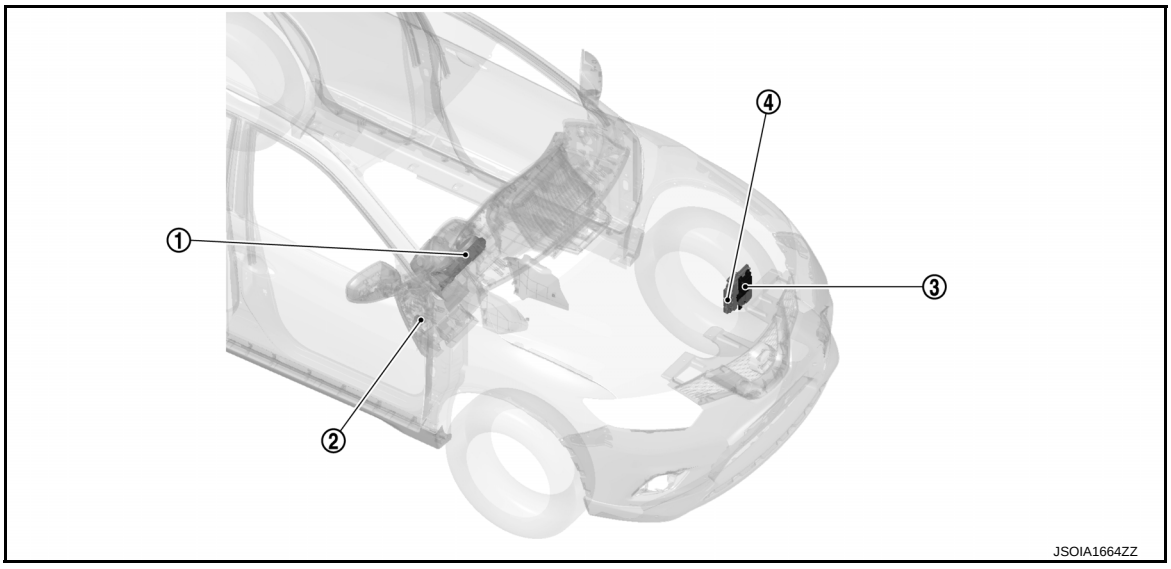


R9M Models



No.	Component	Function
①	TCM	• The TCM receives the following signal via CAN communications from the combination meter. - ECO mode switch signal • The TCM transmits the following signal via CAN communications to the ECM. - ECO mode signal Refer to TM-235, "CVT CONTROL SYSTEM : Component Parts Location" (Except for R9M), TM-466, "CVT CONTROL SYSTEM : Component Parts Location" (R9M) for detailed installation location.
②	ECM	• The ECM receives the following signal via CAN communications from the TCM. - ECO mode signal • The ECM transmits the following signal via CAN communications to the combination meter. - ECO mode indicator signal Refer to EC-28, "ENGINE CONTROL SYSTEM : Component Parts Location" (MR20DD), EC-440, "Component Parts Location" (QR25DE), EC-812, "Component Parts Location" (R9M) for detailed installation location.
③	Combination meter	• The combination meter transmits the following signal via CAN communications to the TCM. - ECO mode switch signal • The combination meter receives the following signal via CAN communications from the ECM. - ECO mode indicator signal Refer to MWI-7, "METER SYSTEM : Component Parts Location" for detailed installation location.
④	ECO mode switch	Refer to DMS-6, "ECO Mode Switch".

RHD MODELS



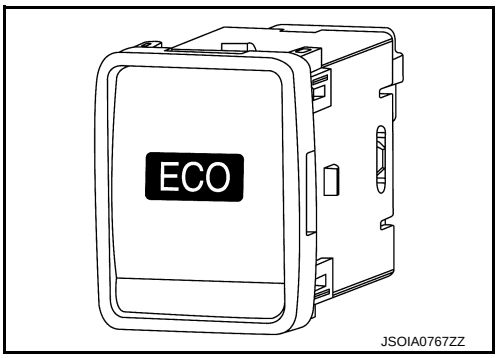
No.	Component	Function
①	Combination meter	• The combination meter transmits the following signal via CAN communications to the TCM. - ECO mode switch signal • The combination meter receives the following signal via CAN communications from the ECM. - ECO mode indicator signal Refer to MWI-7, "METER SYSTEM : Component Parts Location" for detailed installation location.
②	ECO mode switch	Refer to DMS-6, "ECO Mode Switch".

No.	Component	Function
③	TCM	• The TCM receives the following signal via CAN communications from the combination meter. - ECO mode switch signal • The TCM transmits the following signal via CAN communications to the ECM. - ECO mode signal Refer to TM-466, "CVT CONTROL SYSTEM : Component Parts Location" for detailed installation location.
④	ECM	• The ECM receives the following signal via CAN communications from the TCM. - ECO mode signal • The ECM transmits the following signal via CAN communications to the combination meter. - ECO mode indicator signal Refer to EC-812, "Component Parts Location" for detailed installation location.

ECO Mode Switch

INFOID:0000000010623743

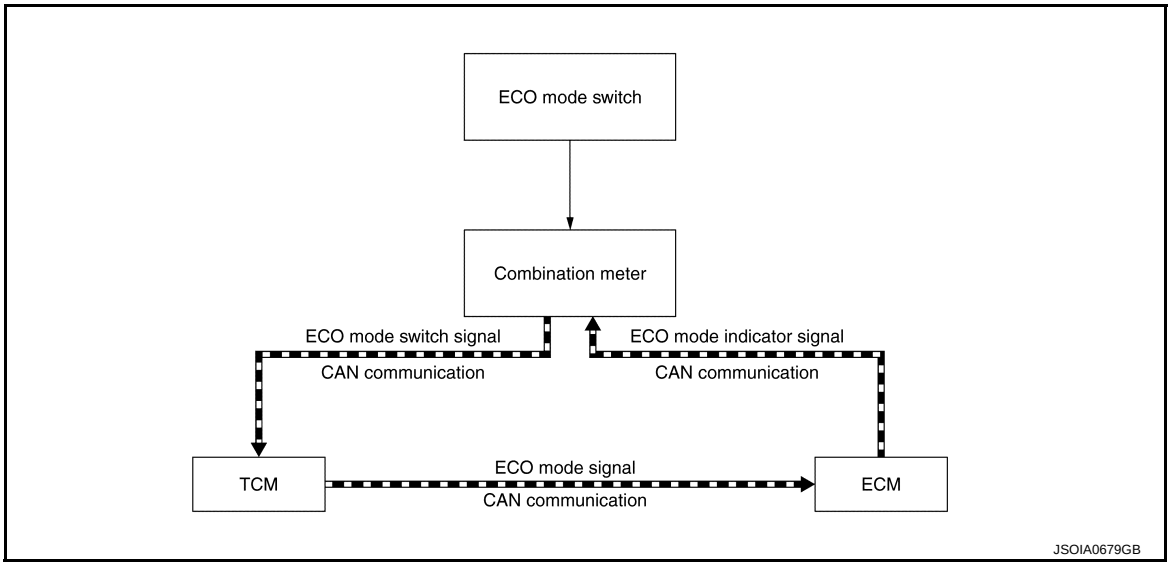
- The ECO mode switch is installed to the instrument lower panel.
- When the ECO mode indicator on the combination meter is OFF and the ECO mode switch is pressed, the ECO mode is active and the ECO mode indicator is ON.
- When the ECO mode indicator on the combination meter is ON and the ECO mode switch is pressed, the ECO mode is cancelled and the ECO mode indicator is OFF.



SYSTEM
ECO MODE CONTROL
ECO MODE CONTROL : System Description

INFOID:0000000010623744

SYSTEM DIAGRAM



SYSTEM DISCRIPTION

- TCM receives ECO mode switch signal (ON/OFF) from combination meter via CAN communication. TCM transmits ECO mode signal to ECM via CAN communication according to the signal.
- ECM transmits ECO mode indicator signal to combination meter via CAN communication. Combination meter displays ECO mode indicator according to the signal.

NOTE:

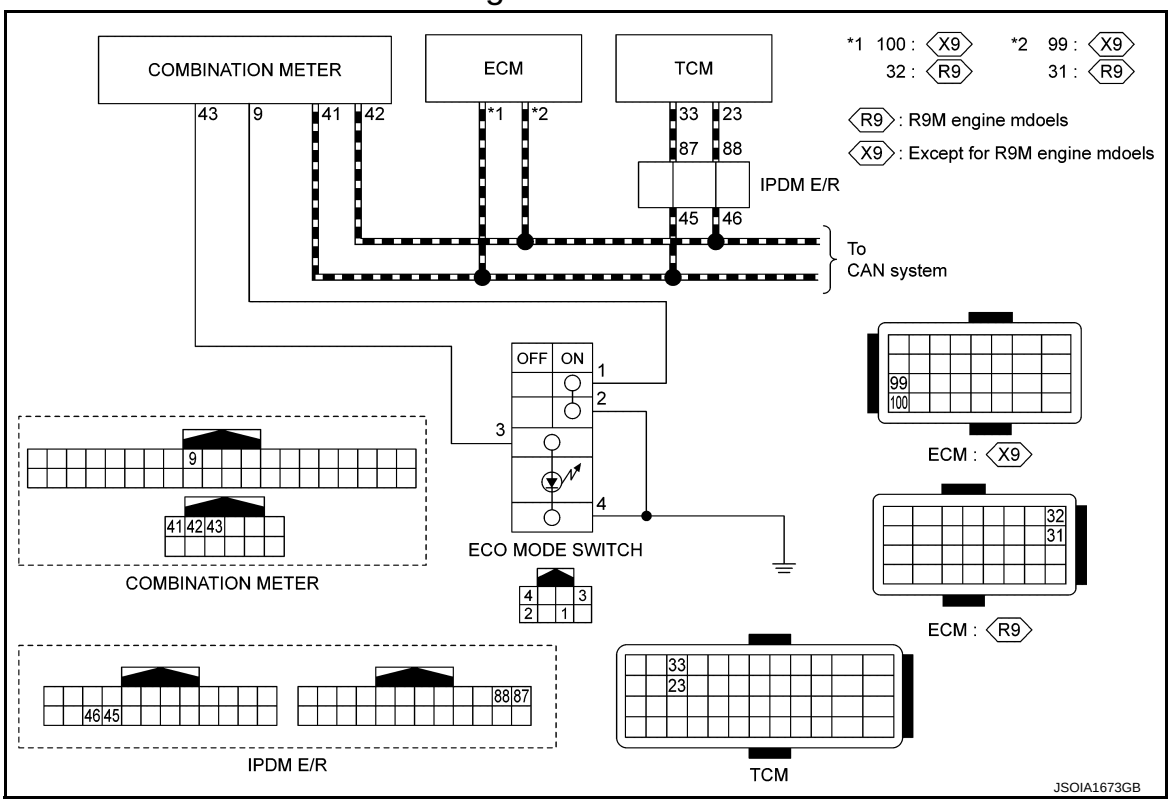
- When the ignition switch is turned ON while the ECO mode indicator stays ON, the ECO mode indicator automatically turns ON at the next ignition switch ON.
- The ECO mode system cannot be turned off while the accelerator pedal is depressed even if the ECO mode switch is pushed to OFF. (ECO mode indicator turns OFF.)
  Release the accelerator pedal to turn off the ECO mode system.
  (Except for R9M)

ECU Control

- For TCM control, refer to TM-267, "ECO MODE SYSTEM : System Description" (Except for R9M), TM-503, "ECO MODE SYSTEM : System Description" (R9M).
- For ECM control, refer to EC-65, "ECO MODE SYSTEM : System Description" (MR20DD), EC-478, "ECO MODE CONTROL : System Description" (QR25DE), EC-868, "ECO MODE SYSTEM : System Description" (R9M).

ECO MODE CONTROL : Circuit Diagram

INFOID:0000000010623745



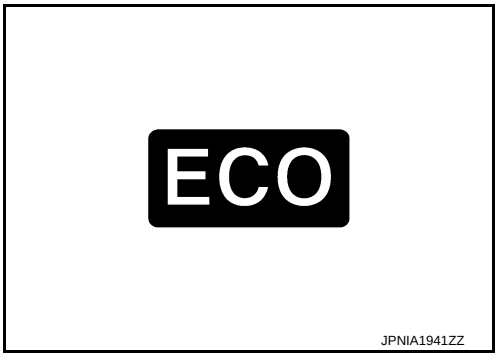
INFORMATION DISPLAY (COMBINATION METER)

INFORMATION DISPLAY (COMBINATION METER) : ECO Mode Indicator

INFOID:0000000010623746

DESIGN/PURPOSE

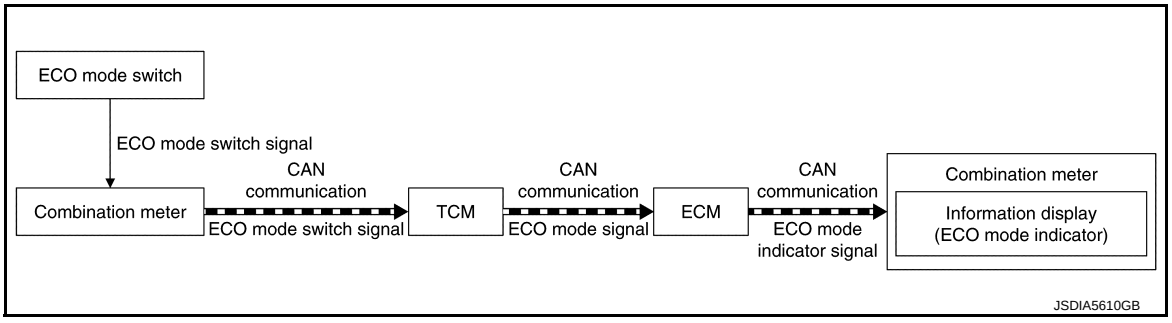
The ECO mode indicator informs the driver that the vehicle is in ECO mode.



OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combination meter, refer to MWI-103, "Fail-Safe".

SYSTEM DIAGRAM



SIGNAL PATH

- TCM receives ECO mode switch signal (ON/OFF) from combination meter via CAN communication. Based on the signal, TCM transmits ECO mode signal to ECM via CAN communication.
- ECM transmits ECO mode indicator signal to combination meter via CAN communication. Based on the signal, combination meter illuminates ECO mode indicator.

LIGHTING CONDITION

When all of the following conditions are satisfied.

- Ignition switch: ON
- The ECO mode switch is pressed when the ECO mode indicator is OFF

NOTE:

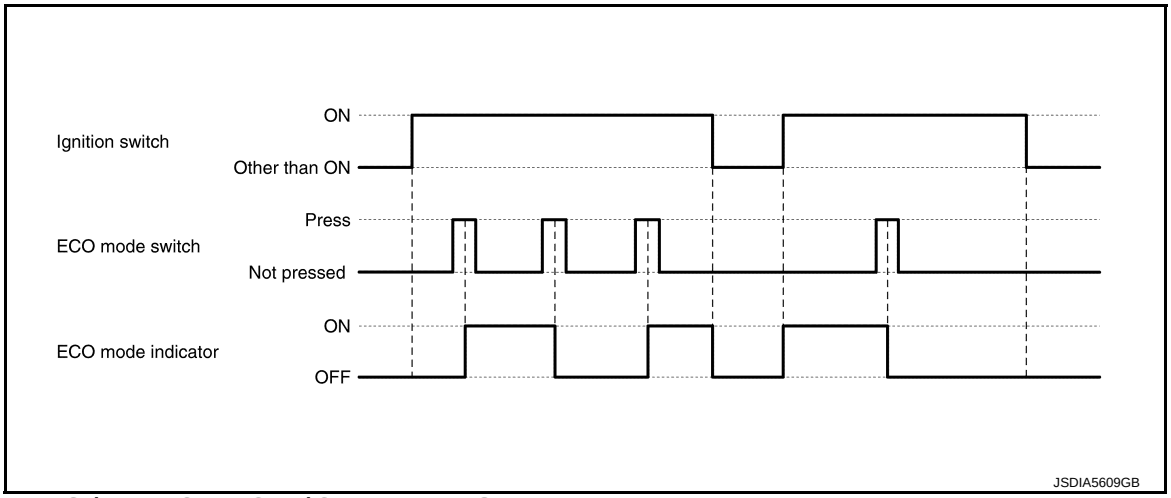
When the ignition switch is turned ON while the ECO mode indicator stays ON, the ECO mode indicator automatically turns ON at the next ignition switch ON.

SHUTOFF CONDITION

When any of the condition listed below is satisfied.

- Ignition switch: Other than ON
- The ECO mode switch is pressed when the ECO mode indicator is ON.

TIMING CHART



WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)

INFOID:0000000010623748

Item	Reference
ECO mode indicator	Refer to DMS-8, "INFORMATION DISPLAY (COMBINATION METER) : ECO Mode Indicator".

ECU DIAGNOSIS INFORMATION

ECO MODE

List of ECU Reference

INFOID:0000000010623749

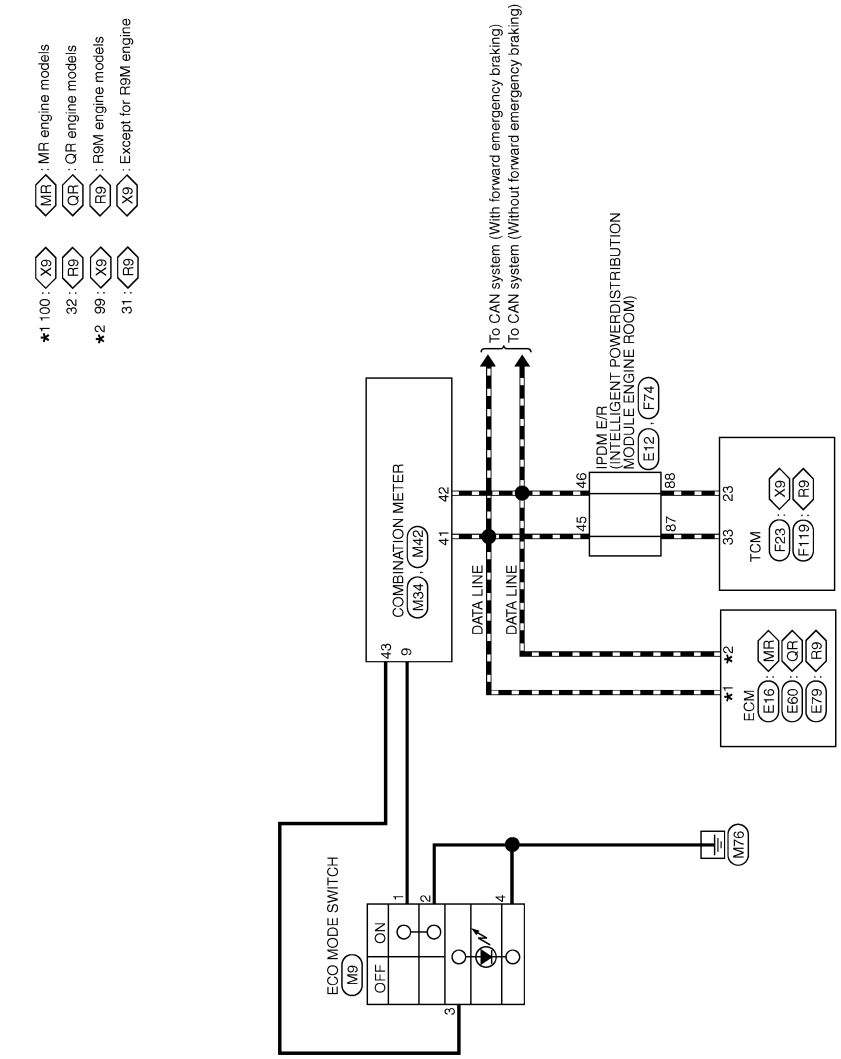
ECU		Reference
TCM	Except for R9M	TM-277, "Reference Value"
		TM-284, "Fail-safe"
		TM-287, "DTC Inspection Priority Chart"
		TM-288, "DTC Index"
	R9M	TM-515, "Reference Value"
		TM-522, "Fail-safe"
		TM-528, "DTC Inspection Priority Chart"
		TM-529, "DTC Index"
ECM	MR20DD	EC-89, "Reference Value"
		EC-103, "Fail-safe"
		EC-107, "DTC Inspection Priority Chart"
		EC-109, "DTC Index"
	QR25DE	EC-501, "Reference Value"
		EC-513, "Fail Safe"
		EC-515, "DTC Inspection Priority Chart"
		EC-517, "DTC Index"
	R9M	EC-889, "Reference Value"
		EC-901, "Fail-safe"
		EC-907, "DTC Inspection Priority Chart"
		EC-908, "DTC Index"
Combination meter		MWI-93, "Reference Value"
		MWI-103, "Fail-Safe"
		MWI-105, "DTC Inspection Priority Chart"
		MWI-105, "DTC Index"

WIRING DIAGRAM

ECO MODE SYSTEM

Wiring Diagram

INFOID:0000000010623750



ECO MODE SYSTEM

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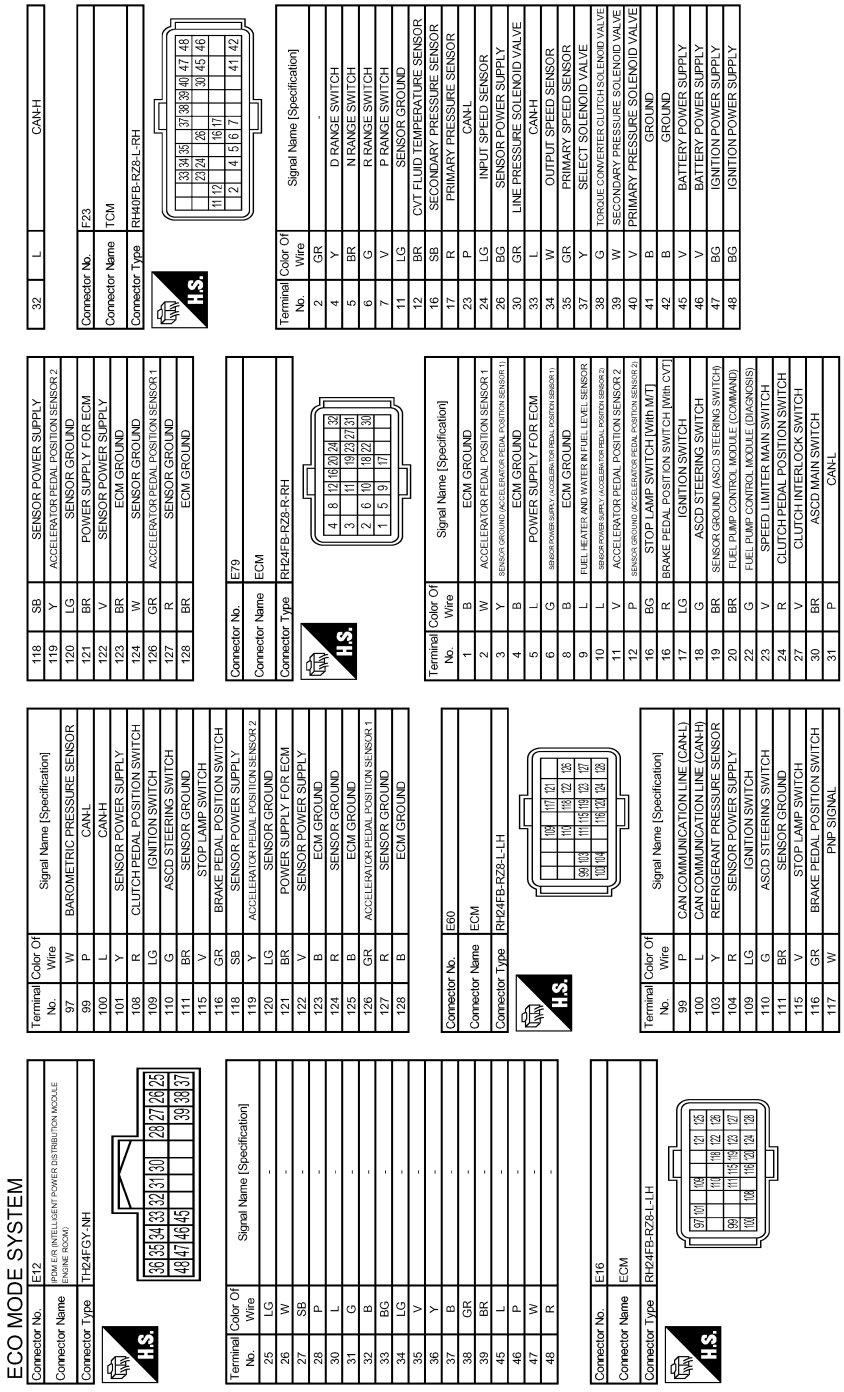

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ECO MODE SYSTEM

Connector No.	F74
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH24FB-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
87	L	-
88	P	-
89	W	-
90	R	-
92	GR	-
93	G	- [With R9M Engine]
93	P	- [With MR20 or QR25 Engine]
94	SB	-
95	LG	-
96	W	-
97	P	-
98	Y	-
99	BG	-
100	LG	-
101	V	-
102	Y	-
105	W	-
106	BR	-
107	V	-
110	SB	-

Connector No.	F119
Connector Name	TCM
Connector Type	RH40FB-RZ8-L-LH

Terminal No.	Color Of Wire	Signal Name [Specification]
1	P	ELECTRIC OIL PUMP RELAY
2	GR	-
4	Y	D RANGE SWITCH
5	BR	N RANGE SWITCH
6	G	R RANGE SWITCH
7	V	P RANGE SWITCH
11	LG	SENSOR GROUND
12	BR	CVT FLUID TEMPERATURE SENSOR
14	V	G SENSOR
16	SB	SECONDARY PRESSURE SENSOR
17	R	PRIMARY PRESSURE SENSOR
23	P	CAN-L
24	LG	INPUT SPEED SENSOR
25	R	ELECTRIC OIL PUMP COMMAND SIGNAL
26	BG	SENSOR POWER SUPPLY
30	GR	LINE PRESSURE SOLENOID VALVE
32	SB	ELECTRIC OIL PUMP STATUS SIGNAL
33	L	CAN-H
34	W	OUTPUT SPEED SENSOR
35	GR	PRIMARY SPEED SENSOR
37	Y	SELECT SOLENOID VALVE
38	G	TORQUE CONVERTER CLUTCH SOLENOID VALVE
39	W	SECONDARY PRESSURE SOLENOID VALVE
40	V	PRIMARY PRESSURE SOLENOID VALVE
41	B	GROUND
42	B	GROUND
45	V	BATTERY POWER SUPPLY
46	V	BATTERY POWER SUPPLY
47	BG	IGNITION POWER SUPPLY
48	BG	IGNITION POWER SUPPLY

Connector No.	M9
Connector Name	ECO MODE SWITCH
Connector Type	TH08FGY-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	-
2	GR	-
3	G	-
4	GR	-

Connector No.	M34
Connector Name	COMBINATION METER
Connector Type	TH40FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GROUND
7	BG	SECURITY SIGNAL
9	GR	ECO MODE SWITCH SIGNAL
15	L	AMBIENT SENSOR SIGNAL
17	BG	METER CONTROL SWITCH GROUND
18	SB	TRIP RESET SWITCH SIGNAL
20	Y	AMBIENT SENSOR GROUND
21	L	STEERING SWITCH GROUND
22	Y	STEERING SWITCH SIGNAL A
23	GR	STEERING SWITCH SIGNAL B
25	V	BRAKE FLUID LEVEL SWITCH SIGNAL
28	Y	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE)
30	LG	MANUAL MODE SIGNAL
31	SB	NON-MANUAL MODE SIGNAL
32	BG	MANUAL MODE SHIFT UP SIGNAL
33	BR	MANUAL MODE SHIFT DOWN SIGNAL

36	GR	ILLUMINATION CONTROL SWITCH SIGNAL (+)
37	V	ILLUMINATION CONTROL SWITCH SIGNAL (-)
38	G	VEHICLE SPEED SIGNAL (8-PULSE)
39	W	VEHICLE SPEED SIGNAL (2-PULSE)

Connector No.	M42
Connector Name	COMBINATION METER
Connector Type	TH12FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
41	L	CAN-H
42	P	CAN-L
43	W	ILLUMINATION CONTROL SIGNAL
44	LA/B	FUEL LEVEL SENSOR GROUND
45	LA/G	BATTERY POWER SUPPLY
46	LA/BR	IGNITION SIGNAL [Without ISS]
46	V	IGNITION SIGNAL [With ISS]
47	SB	AV COMMUNICATION SIGNAL (H)
48	LG	AV COMMUNICATION SIGNAL (L)
49	Y	OIL LEVEL SENSOR SIGNAL
50	BG	OIL LEVEL SENSOR GROUND
51	LA/L	FUEL LEVEL SENSOR SIGNAL
52	B	GROUND

JROWC2866GB

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000010623751

DETAILED FLOW

1.OBTAIN INFORMATION ABOUT SYMPTOM

Interview the customer to obtain as much information as possible about the conditions and environment under which the malfunction occurs.

>> GO TO 2.

2.CHECK SYMPTOM

- Check the symptom based on the information obtained from the customer.
- Check if any other malfunctions are present.

>> GO TO 3.

3.DTC/SYSTEM DIGANOSIS

Perform a DTC/system diagnosis and repair or replace any malfunctioning part.

>> GO TO 4.

4.FINAL CHECK

Check that the ECO mode functions normally.

Does it operation normally?

YES >> End of trouble diagnosis
NO >> GO TO 2.

DTC/CIRCUIT DIAGNOSIS

ECO MODE SWITCH

Component Function Check

INFOID:0000000010623752

1. CHECK ECO MODE SWITCH OPERATION

1. Turn ignition switch ON.
2. Check ECO mode indicator turns ON/OFF on combination meter when turn ECO mode switch ON/OFF.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to DMS-18, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010623753

1. DETECT MALFUNCTIONING ITEMS

What is malfunction item?

ECO mode switch illumination does not turn ON>>GO TO 2.
ECO mode indicator does not turn ON>>GO TO 7.

2. CHECK ECO MODE SWITCH ILLUMINATION POWER SUPPLY (PART 1)

1. Turn OFF the headlamp.
2. Turn ignition switch OFF.
3. Disconnect ECO mode switch harness connector.
4. Turn ignition switch ON.
5. Turn ON the headlamp.
6. Check the voltage between ECO mode switch harness connector terminals.

ECO mode switch			Voltage (Approx.)
Connector	+	–	
	Terminal		
M9	3	4	12 V

Is the inspection result normal?

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

3. CHECK INTERMITTENT INCIDENTE

Refer to GI-44, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace ECO mode switch. Refer to DMS-19, "Removal and Installation".
NO >> Replace the fuse after repair the applicable circuit.

4. CHECK ECO MODE SWITCH ILLUMINATION POWER SUPPLY (PART 2)

Check the voltage between ECO mode switch harness connector and ground.

+		–	Voltage (Approx.)
ECO mode switch			
Connector	Terminal		
M9	3	Ground	12 V

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 5.

5.CHECK CIRCUIT BETWEEN COMBINATION METER AND ECO MODE SWITCH

1. Disconnect combination meter connector M43.
2. Check the continuity between combination meter harness connector terminal and ECO mode switch harness connector terminal.

Combination meter		ECO mode switch		Continuity
Connector	Terminal	Connector	Terminal	
M42	43	M9	3	Existed

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 11.
NO >> Repair or replace malfunctioning parts.

6.CHECK GROUND CIRCUIT

1. Turn OFF the headlamp.
2. Turn ignition switch OFF.
3. Check continuity between ECO mode switch harness connector terminal and ground.

ECO mode switch		—	Continuity
Connector	Terminal		
M9	4	Ground	Existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-44, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

7.CHECK ECO MODE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECO mode switch connector.
3. Turn ignition switch ON.
4. Check voltage between ECO mode switch harness connector terminals.

ECO mode switch			Voltage (Approx.)
Connector	+	–	
	Terminal		
M9	1	2	10 V

Is the inspection result normal?

YES >> GO TO 12.
NO >> GO TO 8.

8.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check the continuity between ECO mode switch harness connector and ground.

ECO mode switch		—	Continuity
Connector	Terminal		
M9	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair or replace malfunctioning parts.

9.CHECK CIRCUIT BETWEEN COMBINATION METER AND ECO MODE SWITCH (PART 1)

1. Disconnect combination meter harness connector M34.

2. Check continuity between combination meter harness connector terminal and ECO mode switch harness connector terminal.

Combination meter		ECO mode switch		Continuity
Connector	Terminal	Connector	Terminal	
M34	9	M9	1	Existed

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair or replace malfunctioning parts.

10. CHECK CIRCUIT BETWEEN COMBINATION METER AND ECO MODE SWITCH (PART 2)

Check continuity between combination meter harness connector terminal and ground.

Combination meter		—	Continuity
Connector	Terminal		
M34	9	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 11.
NO >> Repair or replace malfunctioning parts.

11. CHECK COMBINATION METER INPUT/OUTPUT SIGNAL

1. Connect all of disconnected connectors.
2. Check input/output signal of combination meter. Refer to MWI-93, "Reference Value".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-44, "Intermittent Incident".
NO >> Replace combination meter. Refer to MWI-151, "Removal and Installation".

12. CHECK ECO MODE SWITCH

Check ECO mode switch. Refer to DMS-17, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-44, "Intermittent Incident".
NO >> Replace ECO mode switch. Refer to MWI-151, "Removal and Installation".

Component Inspection

INFOID:0000000010623754

1. CHECK ECO MODE SWITCH

Check continuity between ECO mode switch connector terminals.

ECO mode switch	Condition	Continuity
Terminal		
1 – 2	ECO mode switch is depressed.	Existed
	ECO mode switch is released.	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace ECO mode switch. Refer to DMS-19, "Removal and Installation".

SYMPTOM DIAGNOSIS

THE ECO MODE INDICATOR DOES NOT TURN ON

Description

INFOID:0000000010623755

The ECO mode indicator does not turn ON when the ECO mode switch is operated.

Diagnosis Procedure

INFOID:0000000010623756

1.PERFORM COMBINATION METER ON BOARD DIAGNOSIS

Perform combination meter on board diagnosis and check ECO mode indicator is turns ON. Refer to MWI-84, "On Board Diagnosis Function".

Is the check result normal?

YES >> GO TO 2.
NO >> Replace combination meter. Refer to MWI-151, "Removal and Installation".

2.CHECK DTC (TCM)

With CONSULT

1. Start the engine.
2. Check “Self Diagnostic Results” in “TRANSMISSION”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to TM-288, "DTC Index" (except for R9M), TM-529, "DTC Index" (R9M).
NO >> GO TO 3.

3.CHECK DTC (ECM)

With CONSULT

Check “Self Diagnostic Results” in “ENGINE”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to EC-109, "DTC Index" (MR20DD), EC-517, "DTC Index" (QR25DE), EC-908, "DTC Index" (R9M).
NO >> GO TO 4.

4.CHECK DTC (COMBINATION METER)

With CONSULT

Check “Self Diagnostic Results” in “METER/M&A”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to MWI-105, "DTC Index".
NO >> GO TO 5.

5.CHECK COMBINATION METER INPUT/OUTPUT SIGNAL

With CONSULT

1. Select “Data Monitor” in “METER/M&A”.
2. Select “ECO MODE IND”.
3. Check that “ECO MODE IND” turns ON/OFF when ECO mode switch is operated. Refer to MWI-93, "Reference Value".

Is any DTC detected?

YES >> Replace combination meter. Refer to MWI-151, "Removal and Installation".
NO >> GO TO 6.

6.CHECK ECO MODE SWITCH CIRCUIT

Check ECO mode switch circuit. Refer to DMS-15, "Diagnosis Procedure".

Is the check result normal?

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

REMOVAL AND INSTALLATION

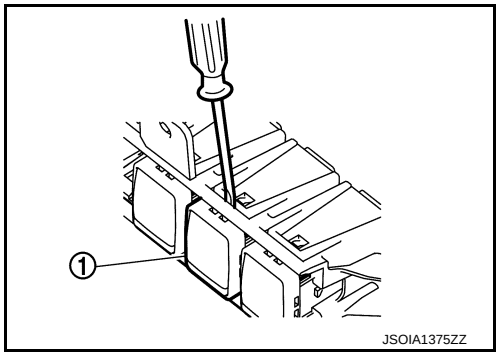
ECO MODE SWITCH

Removal and Installation

INFOID:0000000010623757

REMOVAL

1. Remove instrument lower panel (driver side) or instrument lower panel RH (for Australia). Refer to IP-14, "Removal and Installation" (LHD models), IP-41, "Removal and Installation" (RHD models).
2. Remove switch bracket from instrument lower panel.
3. Remove ECO mode switch ① from switch bracket.
   NOTE:
   For design of ECO mode switch, refer to DMS-6, "ECO Mode Switch".



INSTALLATION

Install in the reverse order of removal.