SECTION MWI
METER, WARNING LAMP & INDICATOR

CONTENTS

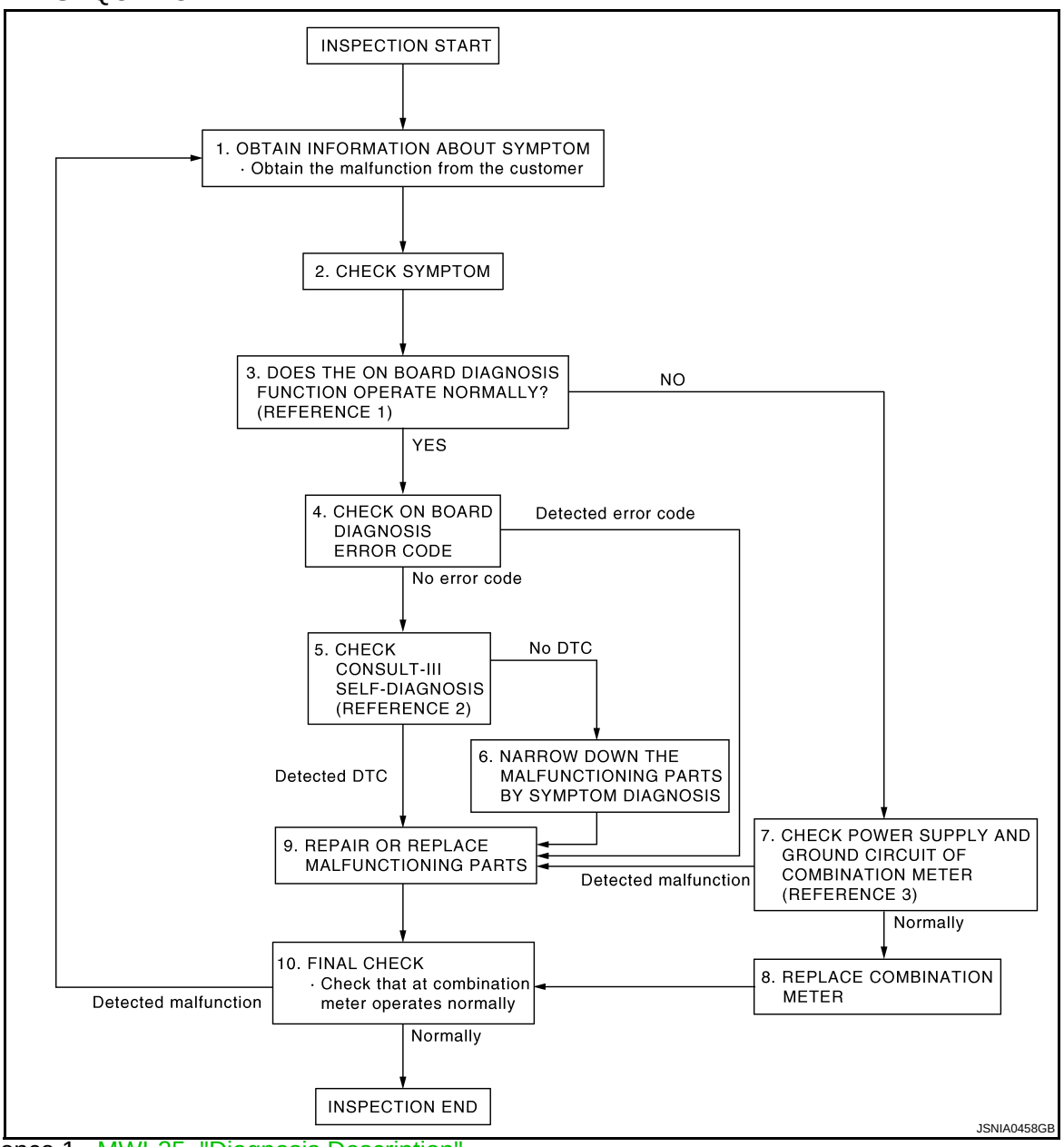
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000001193707

OVERALL SEQUENCE



- Reference 1···MWI-25, "Diagnosis Description".
- Reference 2···MWI-57, "DTC Index".
- Reference 3···MWI-34, "COMBINATION METER : Diagnosis Procedure".

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 occurred.

>> 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.CHECK ON BOARD DIAGNOSIS OPERATION

Check that the on board diagnosis function operates. Refer to MWI-25, "Diagnosis Description".

NOTE:
Perform on board diagnosis, when odo/trip meter is “trip A” or “trip B” display.

Does the on board diagnosis function operate normally?

YES >> GO TO 4.
NO >> GO TO 7.

4.CHECK ON BOARD DIAGNOSIS ERROR CODE

Check if DTC on error code display of on board diagnosis is detected.

If any error code detected?

YES >> Perform diagnosis of the detected error code and go to 9.
NO >> GO TO 5.

5.CHECK CONSULT-III SELF-DIAGNOSIS RESULTS

1. Connect CONSULT-III and perform “Self Diagnostic Result” of combination meter. Refer to MWI-27, "CONSULT-III Function (METER/M&A)".
2. Check if DTC is detected. Refer to MWI-57, "DTC Index".

NOTE:
If “CAN COMM CIRCUIT [U1000]” is displayed, start with the diagnosis for the CAN communication system. Refer to MWI-30, "Diagnosis Procedure".

If any DTC detected?

YES >> GO TO 9.
NO >> GO TO 6.

6.NARROW DOWN THE MALFUNCTIONING PARTS BY SYMPTOM DIAGNOSIS

Perform symptom diagnosis and narrow down the malfunctioning parts.

>> GO TO 9.

7.CHECK POWER SUPPLY AND GROUND CIRCUIT OF COMBINATION METER

Check power supply and ground circuit of combination meter. Refer to MWI-34, "COMBINATION METER : Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 8.
NO >> GO TO 9.

8.REPLACE COMBINATION METER

Replace combination meter.

>> GO TO 10.

9.REPAIR OR REPLACE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

NOTE:
If DTC is displayed, erase DTC after repair or replace malfunctioning parts.

>> GO TO 10.

10.FINAL CHECK

Check that the combination meter operates normally.

Does it operate normally?

YES >> INSPECTION END
NO >> GO TO 1.

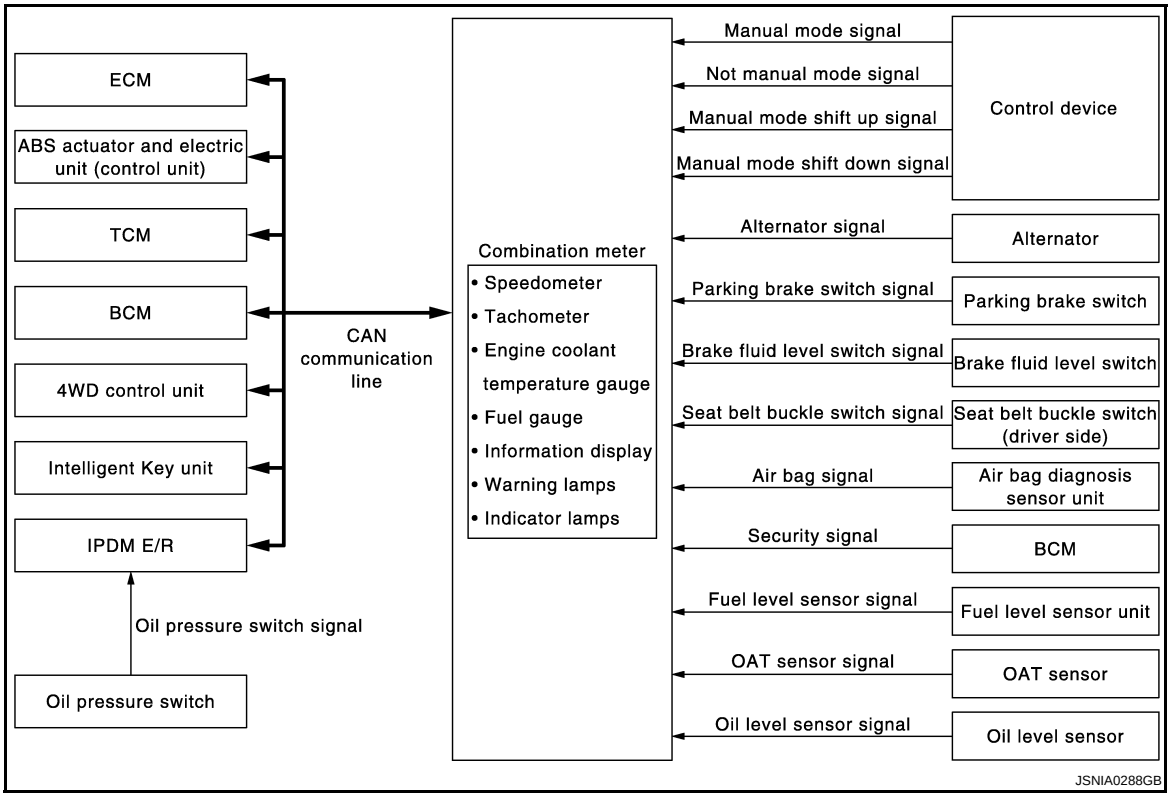
FUNCTION DIAGNOSIS

METER SYSTEM

METER SYSTEM

METER SYSTEM : System Diagram

INFOID:0000000001193708



METER SYSTEM : System Description

INFOID:0000000001193709

COMBINATION METER

- The combination meter receives the information required to control the operation of each gauge, indicator/ warning lamp, and information display via CAN communication from each unit, each switch, and sensor.
- The combination meter incorporates a trip computer that displays messages on the information display according to the information received from various units.
- The combination meter incorporates a buzzer function that sounds an audible alarm with the integrated buzzer device. Refer to WCS-5, "WARNING CHIME SYSTEM : System Description" for further details.
- The combination meter integrates the meter circuit check function and the segment check function that checks the information display operation.

IPDM E/R

- IPDM E/R reads the ON/OFF signals of the oil pressure switch and transmits the oil pressure switch signal to the combination meter via BCM with CAN communication.
- IPDM E/R is equipped with the diagnosis function. It can perform the operation check of oil pressure warning lamp with the auto active test and the diagnosis with CONSULT-III.

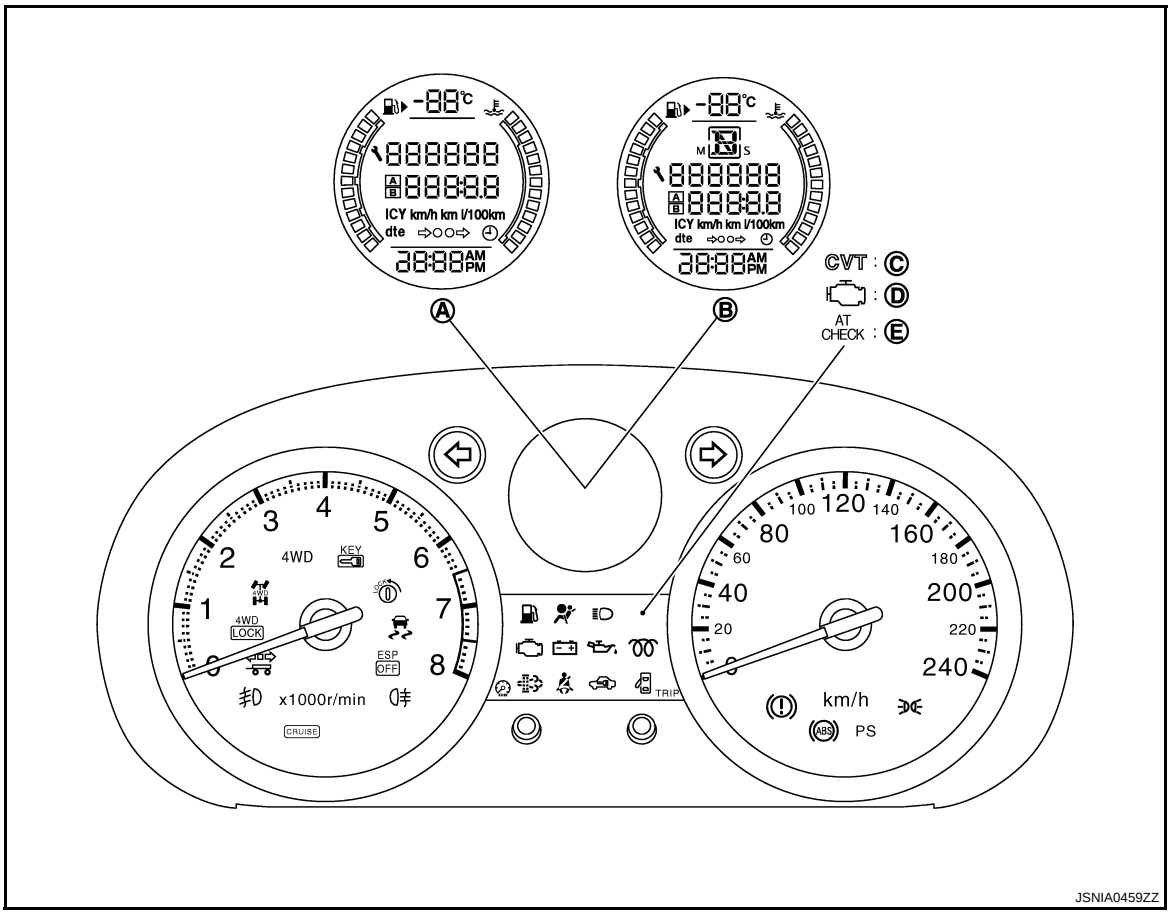
METER CONTROL FUNCTION LIST

System		Description	Signal source
Meter	Speedometer	Receives vehicle speed signal and indicates vehicle speed.	ABS actuator and electric unit (control unit)
	Tachometer	Receives engine speed signal and indicates engine speed.	ECM

System		Description	Signal source
Warning lamp	Oil pressure warning lamp	Receives oil pressure warning lamp signal and illuminates warning lamp.	IPDM E/R
Information display	Fuel gauge	Receives fuel level sensor signal and indicates fuel level.	Fuel level sensor unit
	Engine coolant temperature gauge	Receives engine coolant temperature signal and indicates coolant temperature.	ECM
	Maintenance*1	The remaining distance from the set distance is displayed for 5 seconds after the ignition switch is turned ON.	ABS actuator and electric unit (control unit)
	Oil level	The oil level is displayed according to the oil level sensor signal for 5 seconds after the maintenance display.	Oil level sensor
	Possible driving distance*1	Calculates possible driving distance based on received fuel consumption monitor signal, vehicle speed signals and fuel level sensor signal and displays it.	ECM
			ABS actuator and electric unit (control unit)
			Fuel level sensor unit
	Average fuel consumption*1	Calculates average fuel consumption in a reset-to-reset interval based on received vehicle speed signals and fuel consumption monitor signal and displays it.	ECM
			ABS actuator and electric unit (control unit)
	Average vehicle speed*1	Calculates average vehicle speed in a reset-to-reset interval based on received vehicle speed signals and displays it.	ABS actuator and electric unit (control unit)
	Travel time*1	Displays accumulated key switch ON time from reset to reset.	—
	Odo/trip meter	Calculates accumulated travel distance based on received vehicle speed signals and displays it.	ABS actuator and electric unit (control unit)
	Ambient air temperature	Corrects ambient temperature value based on received OAT sensor signals and displays it.	OAT sensor
	Clock*1	Time is displayed.	—

*1: With NAVI does not display.

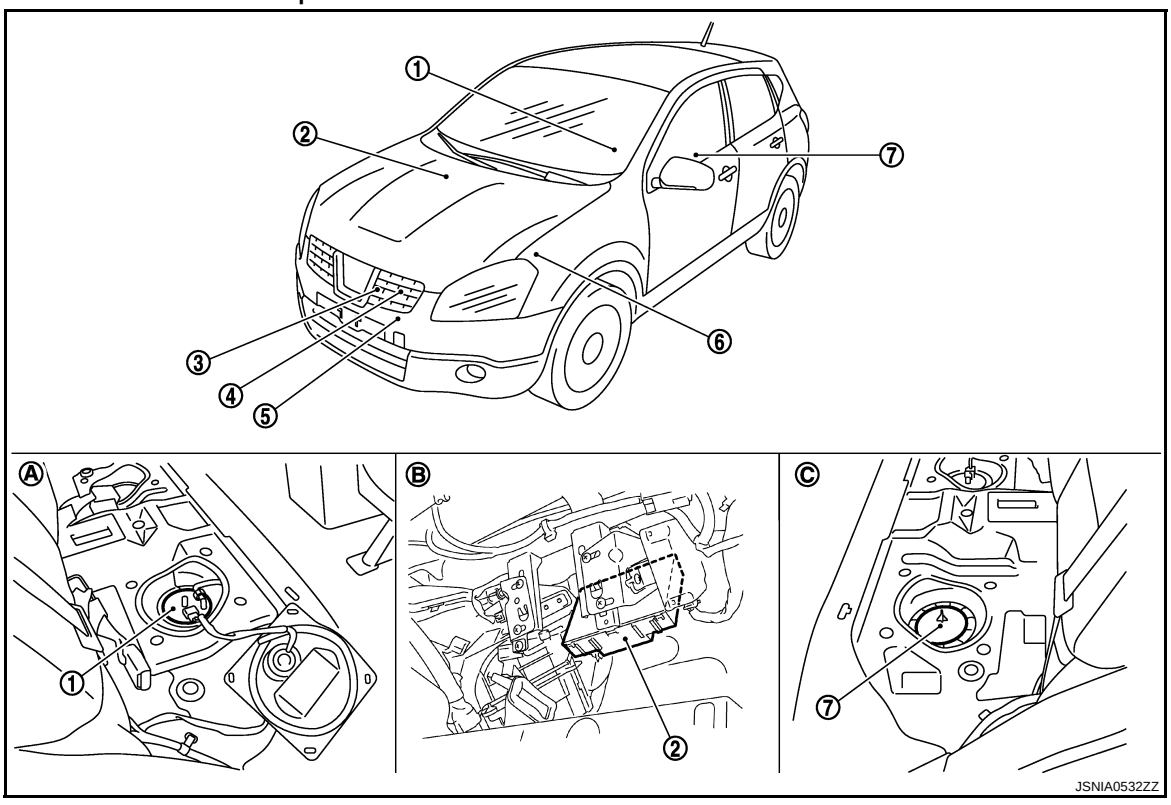
ARRANGEMENT OF COMBINATION METER



A. M/T models
B. Except M/T models
C. CVT models
D. K9K engine models
E. A/T models

METER SYSTEM : Component Parts Location

INFOID:0000000001193710



1. Fuel level sensor unit (main)
2. BCM
3. OAT sensor
4. Oil pressure switch
5. Oil level sensor
6. IPDM E/R
7. Fuel level sensor unit (sub)

A. Lower right side of rear seat
B. Over the glove box
C. Lower left side of rear seat (4WD models)

METER SYSTEM : Component Description

INFOID:0000000001193711

Unit	Description
Combination meter	Controls the following with the signals received from each unit via CAN communication and the signals from switches and sensors. • Speedometer • Tachometer • Warning lamps • Indicator lamps • Information display • Warning chime
IPDM E/R	Reads the ON/OFF signals of the oil pressure switch and transmits the oil pressure switch signal to the combination meter via BCM with CAN communication line.
Fuel level sensor unit	Refer to MWI-36, "2WD : Description" (2WD) or MWI-38, "4WD : Description" (4WD).
Oil pressure switch	Refer to MWI-41, "Description".
ECM	Transmits the following signals to the combination meter with CAN communication line. • Engine speed signal • Engine coolant temperature signal • Fuel consumption monitor signal
ABS actuator and electric unit (control unit)	Transmits the vehicle speed signal to the combination meter with CAN communication line.
BCM	Transmits signals provided by various units to the combination meter with CAN communication line.
Control device	Transmits the following signals to the combination meter. • Manual mode signal • Not manual mode signal • Manual mode shift up signal • Manual mode shift down signal
TCM	Transmits shift position signal to the combination meter.
Oil level sensor	Refer to MWI-32, "Description".
Brake fluid level switch	Transmits the brake fluid level switch signal to the combination meter.
Parking brake switch	Refer to WCS-24, "Description".

METER SYSTEM : Operation Description

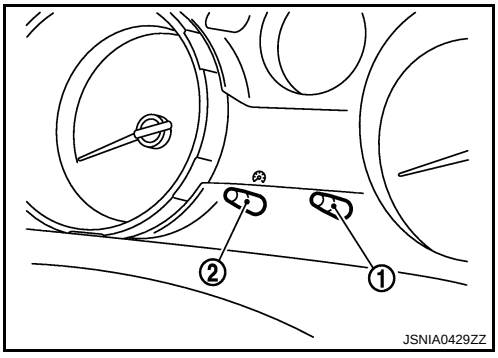
INFOID:0000000001193712

TRIP COMPUTER

- The display switches in the following order when pressing the trip switch (1) of the combination meter.

2 : switch

- Trip A → Trip B → Possible driving distance → Average fuel consumption → Average vehicle speed → Travel time → Trip A.
  NOTE:
  With NAVI: Trip A → Trip B → Trip A.
- The items other than “odo meter” and “possible driving distance” can be reset when pressing and holding the trip switch for 1 second or more.

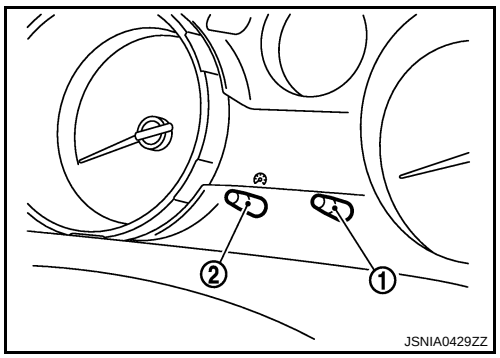


- All items other than “odo meter” and “possible driving distance” can be reset when pressing and holding the trip switch for 3 seconds or more.

MAINTENANCE

1. Turn ignition switch ON.

2. Press and hold the trip switch (1) for 3 seconds or more while displaying the maintenance information to the information display (for approximately 5 seconds after the ignition switch is turned ON).



2 : switch

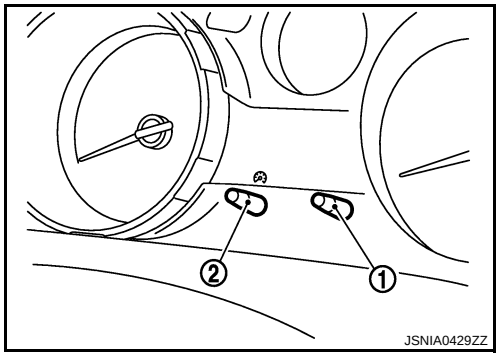
3. The maintenance information is flashed and the system enters in the set/reset mode.
4. The set/reset can be performed with the following operation during flashing.

Trip switch	
Pressed	: Reset
Turn right	: Increase the set distance
Turn left	: Decrease the set distance

5. If trip switch is not input for 5 seconds, then the display goes back to odometer mode, and new interval is set.

CLOCK

- The display switches between 12-hour time display mode and 24-hour time display mode with pressing the switch (2) of the combination meter.



1 : trip switch

- The “hour” display of clock is flashed when pressing and holding the switch for 3 seconds or more, and then the clock switches to the time adjustment mode.

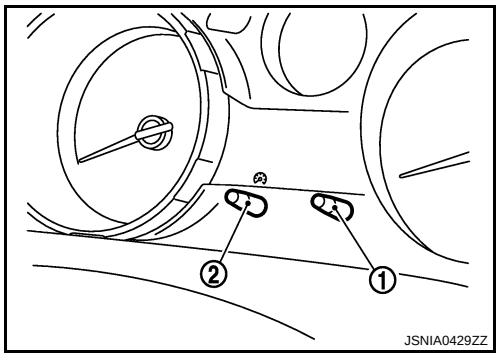
switch	
Pressed	: Changing adjustment “hour” and “minute”
Turn right	: Go
Turn left	: Back

NOTE:
With NAVI system does not display.

METER ILLUMINATION CONTROL

Nighttime Mode

The meter illumination is adjusted to 22 steps by turning the switch (2). (Daytime mode cannot be adjusted.)



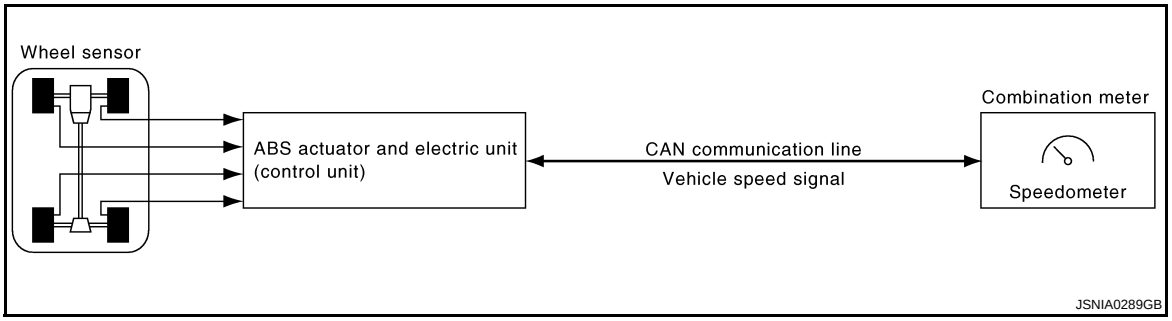
1 : trip switch

switch	
Turn right	: Lightening
Turn left	: Darkening

SPEEDOMETER

SPEEDOMETER : System Diagram

INFOID:0000000001193713



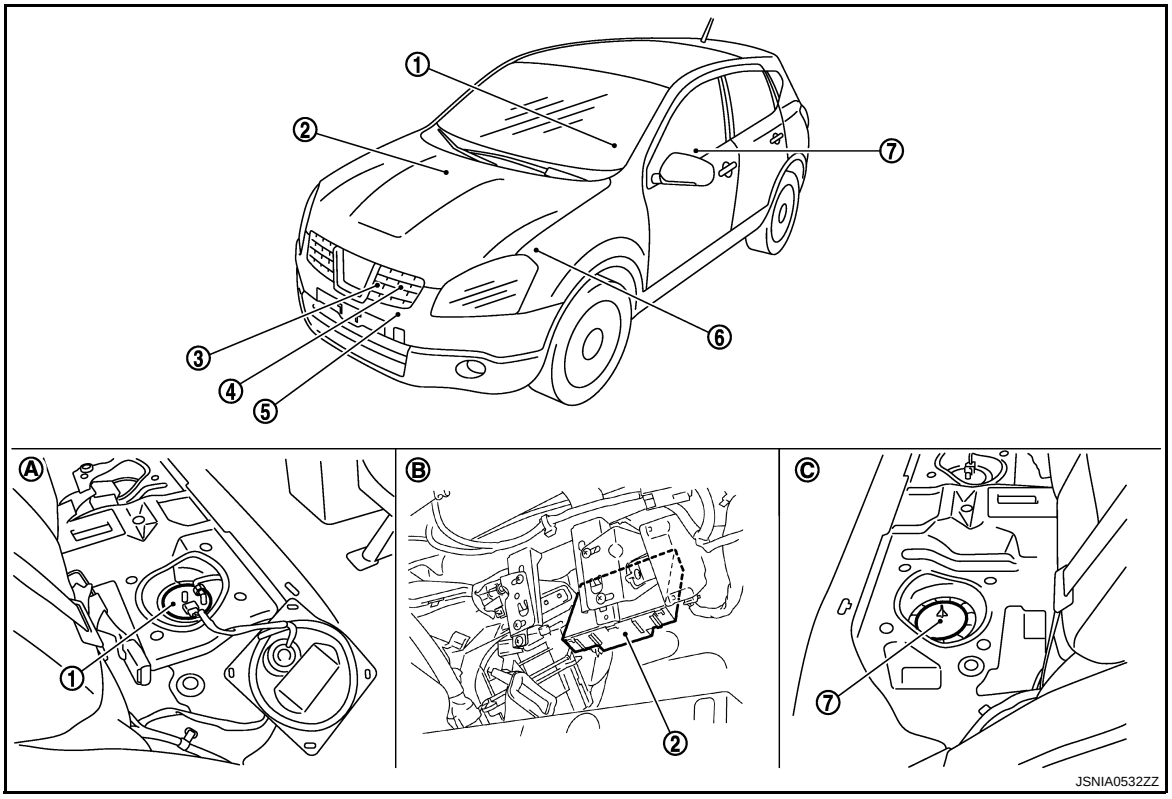
SPEEDOMETER : System Description

INFOID:0000000001193714

- The ABS actuator and electric unit (control unit) converts the rectangular wave signal provided by the wheel sensor to a vehicle speed signal and transmits it to the combination meter via CAN communication.
- The combination meter indicates the vehicle speed to the speedometer according to the vehicle speed signal received via CAN communication.

SPEEDOMETER : Component Parts Location

INFOID:0000000001470336



1. Fuel level sensor unit (main)
2. BCM
3. OAT sensor
4. Oil pressure switch
5. Oil level sensor
6. IPDM E/R
7. Fuel level sensor unit (sub)

A. Lower right side of rear seat
B. Over the glove box
C. Lower left side of rear seat (4WD models)

SPEEDOMETER : Component Description

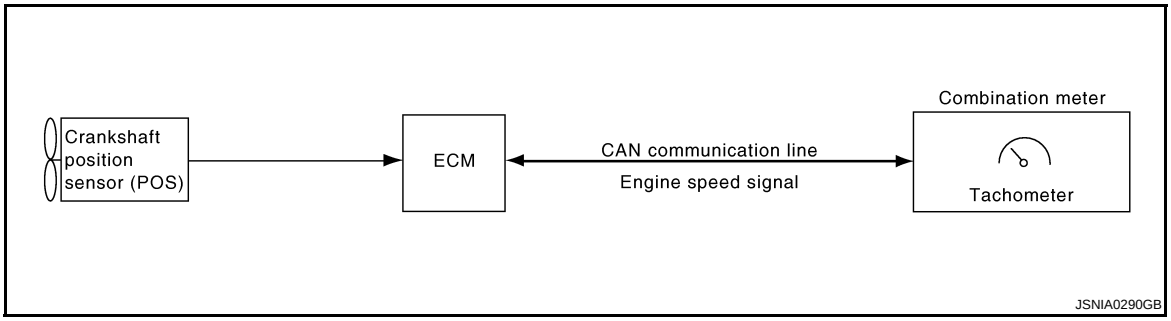
INFOID:0000000001193716

Unit	Description
Combination meter	Indicates the vehicle speed to the speedometer according to the vehicle speed signal received from ABS actuator and electric unit (control unit) via CAN communication.
ABS actuator and electric unit (control unit)	Transmits the vehicle speed signal to the combination meter with CAN communication line.

TACHOMETER

TACHOMETER : System Diagram

INFOID:0000000001193717



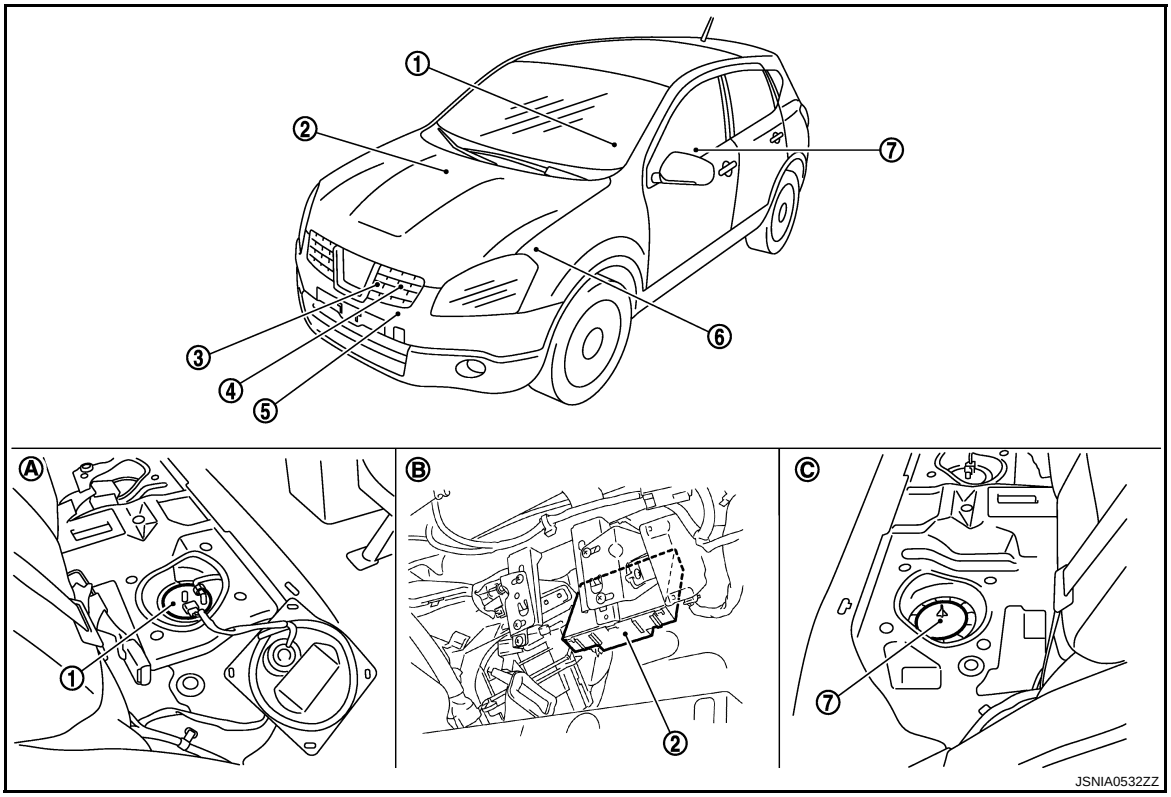
TACHOMETER : System Description

INFOID:0000000001193718

- ECM converts the pulse signal provided by the crankshaft position sensor to an engine speed signal and transmits it to the combination meter with CAN communication line.
- The combination meter indicates the engine speed to the tachometer according to the engine speed signal received via CAN communication.

TACHOMETER : Component Parts Location

INFOID:0000000001470337



1. Fuel level sensor unit (main)
2. BCM
3. OAT sensor
4. Oil pressure switch
5. Oil level sensor
6. IPDM E/R

7. Fuel level sensor unit (sub)

A. Lower right side of rear seat B. Over the glove box C. Lower left side of rear seat (4WD models)

TACHOMETER : Component Description

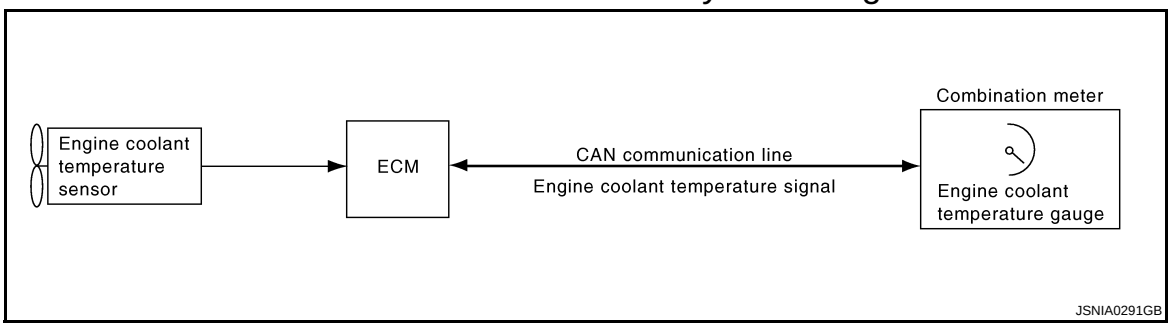
INFOID:0000000001193720

Unit	Description
Combination meter	Indicates the engine speed to the tachometer according to the engine speed signal received from ECM via CAN communication.
ECM	Transmits the engine speed signal to the combination meter with CAN communication line.

ENGINE COOLANT TEMPERATURE GAUGE

ENGINE COOLANT TEMPERATURE GAUGE : System Diagram

INFOID:0000000001193721



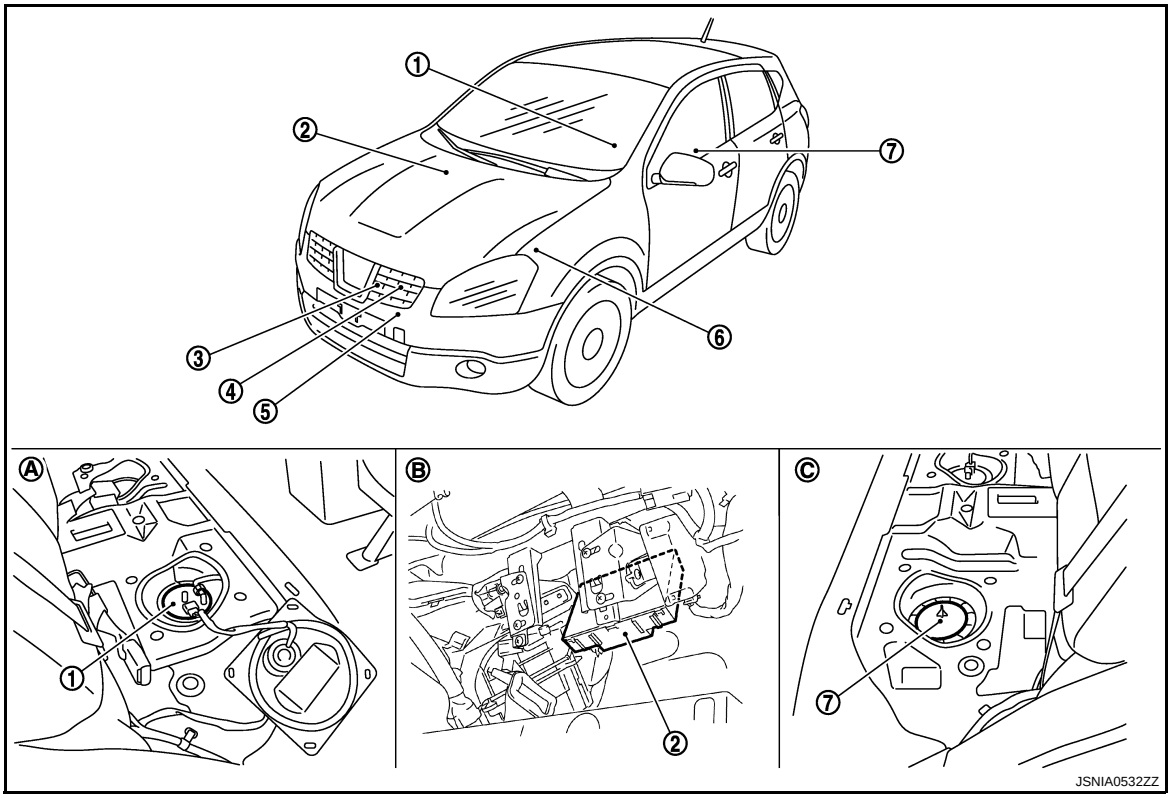
ENGINE COOLANT TEMPERATURE GAUGE : System Description

INFOID:0000000001193722

- ECM reads the engine coolant temperature signal from the engine coolant temperature sensor and transmits the signal to the combination meter via CAN communication.
- The combination meter indicates the engine coolant temperature to the water temperature gauge according to the engine coolant temperature signal received via CAN communication.

ENGINE COOLANT TEMPERATURE GAUGE : Component Parts Location

INFOID:0000000001470338



1. Fuel level sensor unit (main)
2. BCM
3. OAT sensor
4. Oil pressure switch
5. Oil level sensor
6. IPDM E/R
7. Fuel level sensor unit (sub)

A. Lower right side of rear seat
B. Over the glove box
C. Lower left side of rear seat (4WD models)

ENGINE COOLANT TEMPERATURE GAUGE : Component Description

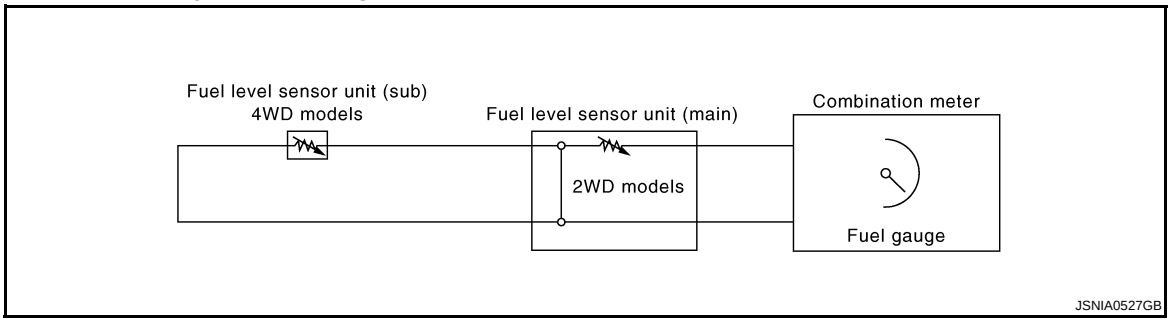
INFOID:0000000001193724

Unit	Description
Combination meter	Indicates the engine coolant temperature to the water temperature gauge according to the engine coolant temperature signal received from ECM via CAN communication.
ECM	Transmits the engine coolant temperature signal to the combination meter via CAN communication.

FUEL GAUGE

FUEL GAUGE : System Diagram

INFOID:0000000001193725



FUEL GAUGE : System Description

INFOID:0000000001193726

CONTROL OUTLINE

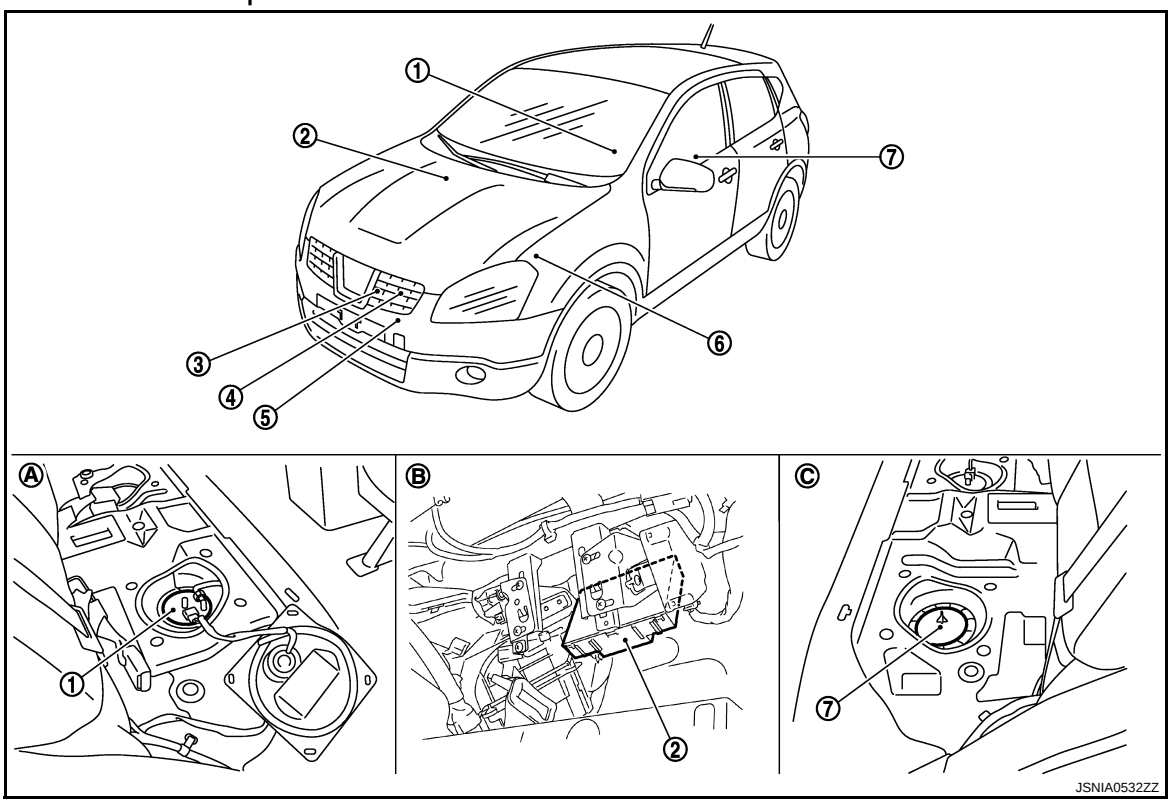
The combination meter reads the fuel level sensor signal from the fuel level sensor unit and indicates the fuel level to the fuel gauge.

REFUEL CONTROL

The unit judges that the driver is refueling the vehicle and accelerates the fuel gauge segment display if the fuel level changes by 4 ℓ (7/8 lmp gal) or more.

FUEL GAUGE : Component Parts Location

INFOID:0000000001470339



1. Fuel level sensor unit (main)
2. BCM
3. OAT sensor
4. Oil pressure switch
5. Oil level sensor
6. IPDM E/R
7. Fuel level sensor unit (sub)

A. Lower right side of rear seat
B. Over the glove box
C. Lower left side of rear seat (4WD models)

FUEL GAUGE : Component Description

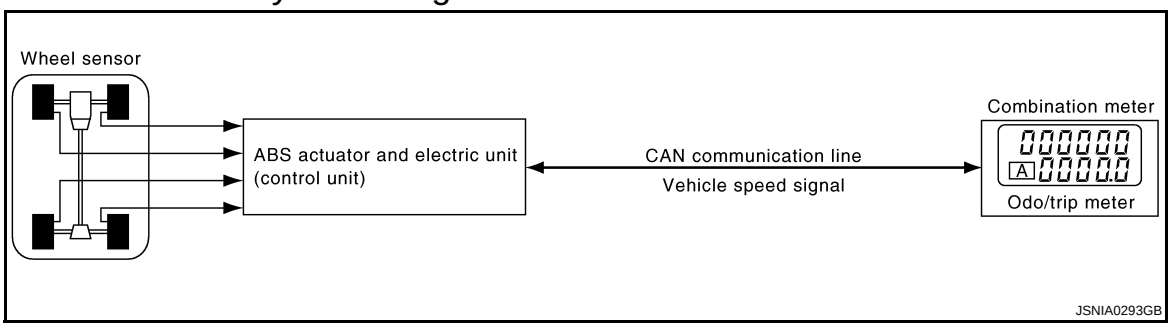
INFOID:0000000001193728

Unit	Description
Combination meter	Indicates the fuel gauge according to the fuel level sensor signal received from the fuel level sensor unit.
Fuel level sensor unit	Refer to MWI-36, "2WD : Description" (2WD) or MWI-38, "4WD : Description" (4WD).

ODO/TRIP METER

ODO/TRIP METER : System Diagram

INFOID:0000000001193729



ODO/TRIP METER : System Description

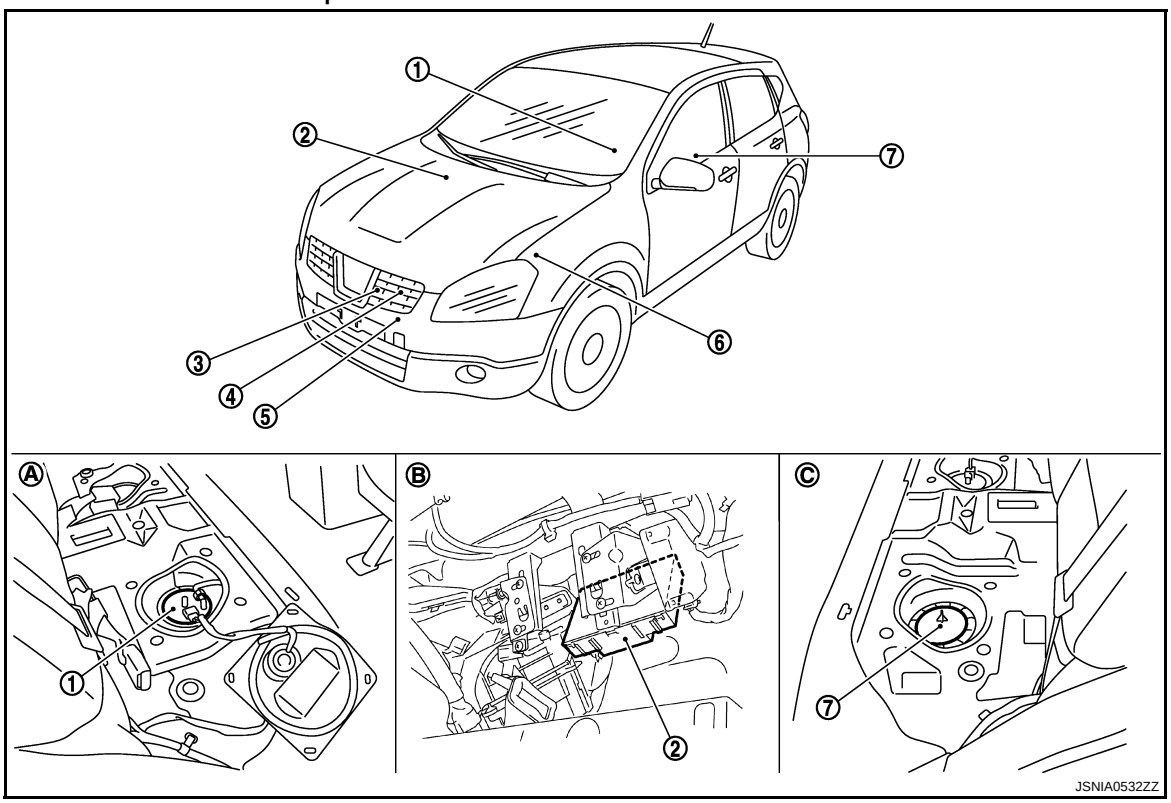
INFOID:0000000001193730

- The ABS actuator and electric unit (control unit) reads the rectangular wave signal provided by the wheel sensor and transmits the vehicle speed signal to the combination meter via CAN communication.

- The combination meter converts the vehicle speed signal received via CAN communication to mileage, and it displays the accumulated mileage to the odo/trip meter.

ODO/TRIP METER : Component Parts Location

INFOID:0000000001470340



1. Fuel level sensor unit (main)	2. BCM	3. OAT sensor
4. Oil pressure switch	5. Oil level sensor	6. IPDM E/R
7. Fuel level sensor unit (sub)		
A. Lower right side of rear seat	B. Over the glove box	C. Lower left side of rear seat (4WD models)

ODO/TRIP METER : Component Description

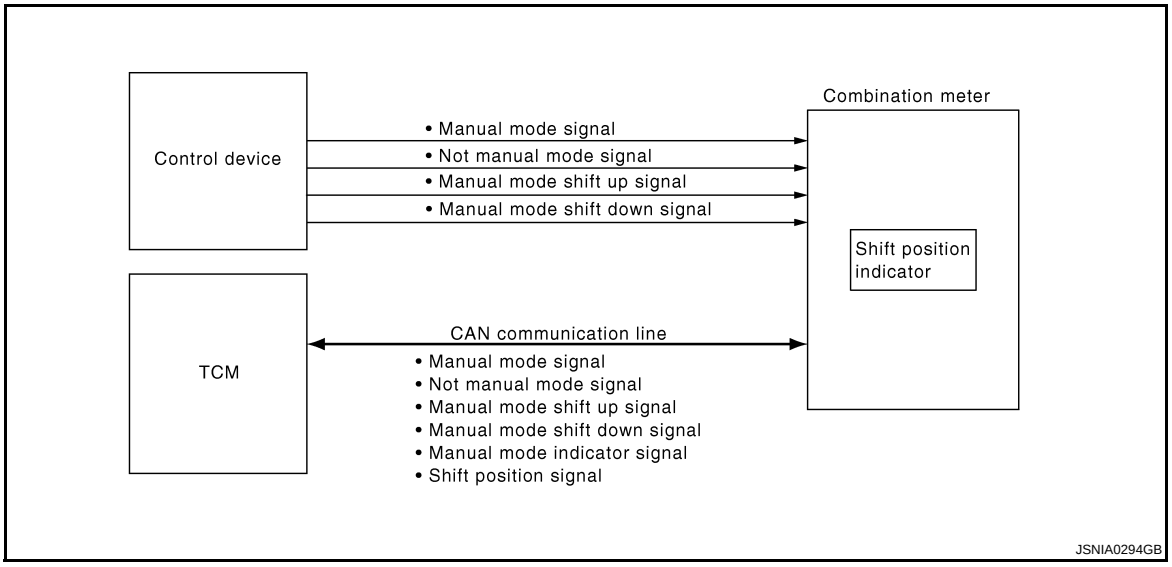
INFOID:0000000001193732

Unit	Description
Combination meter	Converts the vehicle speed signal received from the ABS actuator and electric unit (control unit) via CAN communication to mileage, and it displays the accumulated mileage to the odo/trip meter.
ABS actuator and electric unit (control unit)	Transmits the vehicle speed signal to the combination meter via CAN communication.

SHIFT POSITION INDICATOR

SHIFT POSITION INDICATOR : System Diagram

INFOID:0000000001193733



SHIFT POSITION INDICATOR : System Description

INFOID:0000000001193734

Shift position is displayed in the information display LCD in the combination meter.

MANUAL MODE

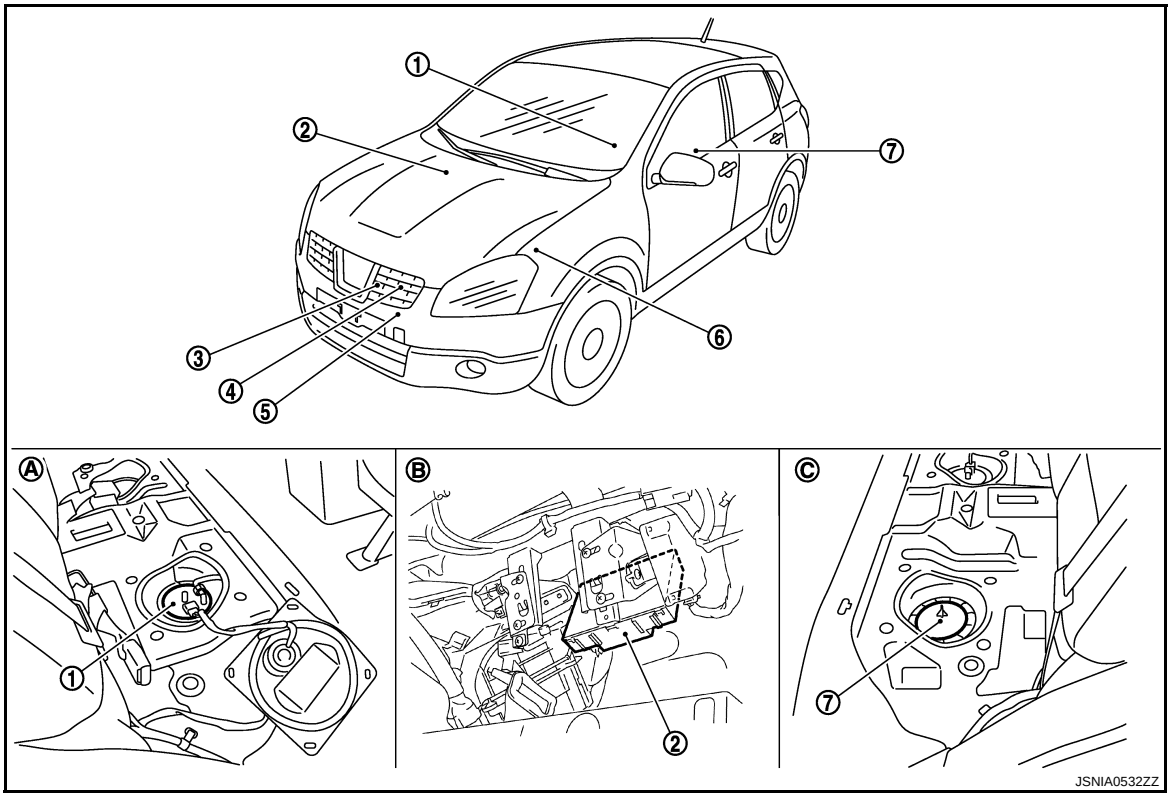
- The combination meter receives the manual mode signal, manual mode shift up signal, and manual mode shift down signal from control device and transmits them to TCM via CAN communication.
- TCM recognizes the manual mode operation status according to the manual mode signal, manual mode shift up signal, and manual mode shift down signal received via CAN communication and transmits the manual mode indicator signal to the combination meter via CAN communication.
- The combination meter indicates shift position according to the manual mode indicator signal received via CAN communication.

NOT MANUAL MODE (AUTO MODE)

- TCM transmits the shift position signal to the combination meter via CAN communication.
- The combination meter indicates shift position according to the shift position signal received via CAN communication.

SHIFT POSITION INDICATOR : Component Parts Location

INFOID:0000000001470341



1. Fuel level sensor unit (main)	2. BCM	3. OAT sensor
4. Oil pressure switch	5. Oil level sensor	6. IPDM E/R
7. Fuel level sensor unit (sub)		
A. Lower right side of rear seat	B. Over the glove box	C. Lower left side of rear seat (4WD models)

SHIFT POSITION INDICATOR : Component Description

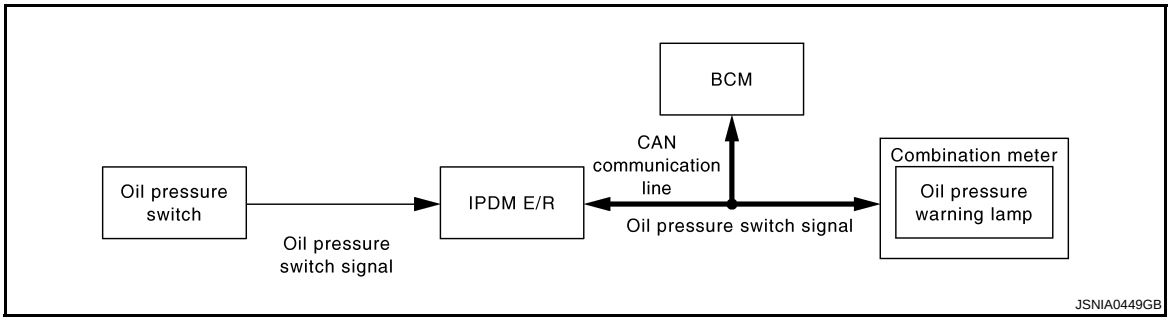
INFOID:0000000001193736

Unit	Description
Combination meter	Displays the shift position on the information display with shift position signal and manual mode indicator signal received from TCM.
Control device	Transmits the following signals to the combination meter. • Manual mode signal • Not manual mode signal • Manual mode shift up signal • Manual mode shift down signal
TCM	Transmits the shift position signal and the manual mode indicator signal to the combination meter via CAN communication.

WARNING LAMPS/INDICATOR LAMPS

WARNING LAMPS/INDICATOR LAMPS : System Diagram

INFOID:0000000001193737



WARNING LAMPS/INDICATOR LAMPS : System Description

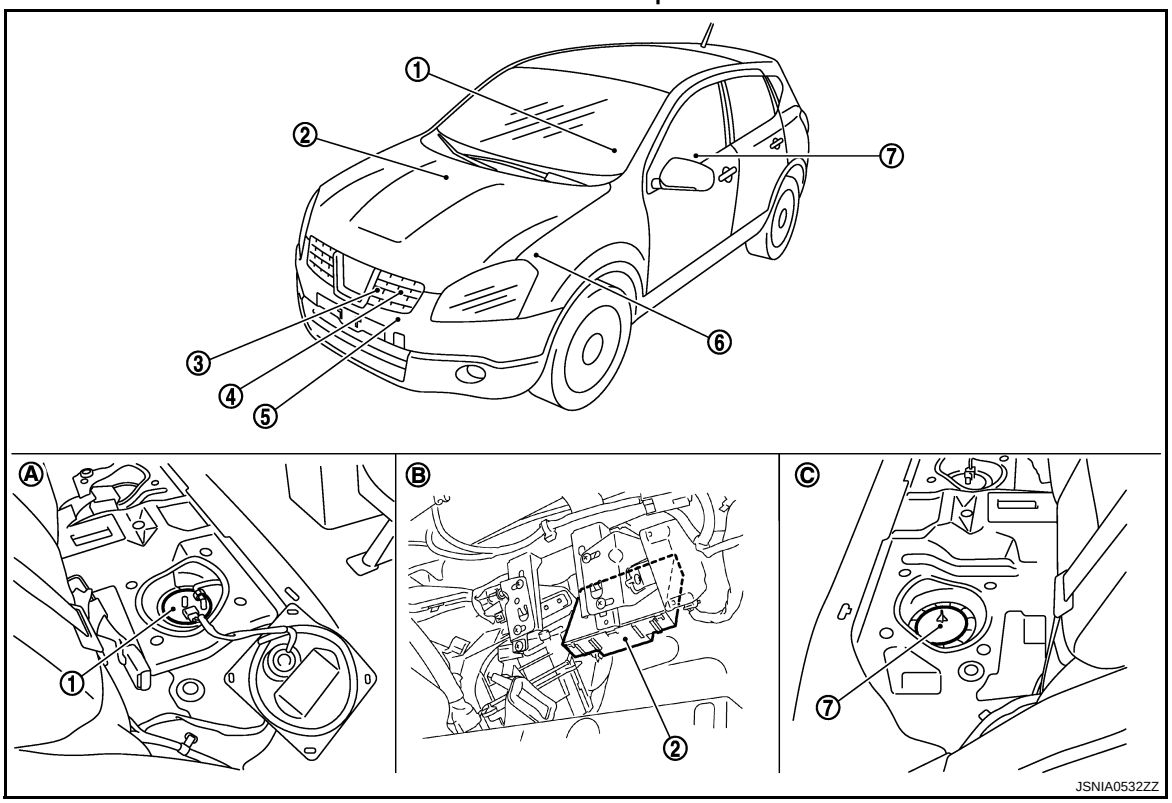
INFOID:0000000001193738

OIL PRESSURE WARNING LAMP

- IPDM E/R reads the ON/OFF signals from the oil pressure switch and transmits the oil pressure switch signal to the combination meter via BCM with the CAN communication line.
- The combination meter turns the oil pressure warning lamp ON/OFF according to the oil pressure switch signal received via CAN communication.

WARNING LAMPS/INDICATOR LAMPS : Component Parts Location

INFOID:0000000001470342



1.	Fuel level sensor unit (main)	2.	BCM	3.	OAT sensor
4.	Oil pressure switch	5.	Oil level sensor	6.	IPDM E/R
7.	Fuel level sensor unit (sub)				
A.	Lower right side of rear seat	B.	Over the glove box	C.	Lower left side of rear seat (4WD models)

WARNING LAMPS/INDICATOR LAMPS : Component Description

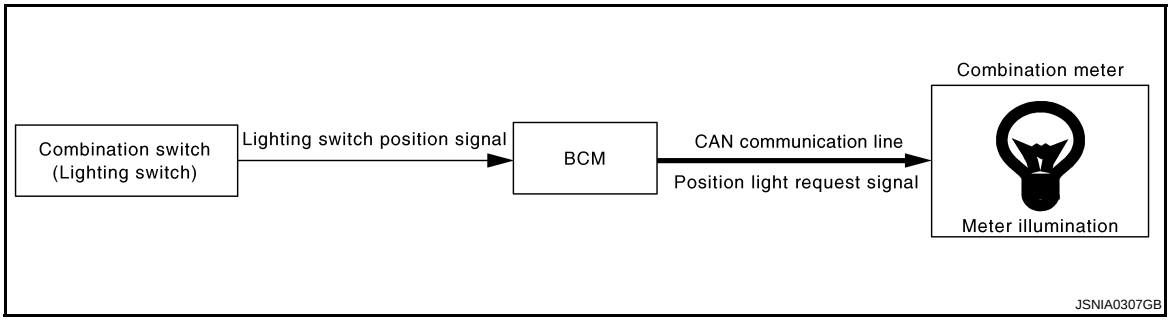
INFOID:0000000001193740

Unit	Description
Combination meter	Turns the oil pressure warning lamp ON/OFF according to the oil pressure switch signal received from BCM by means of CAN communication.
IPDM E/R	Reads the ON/OFF signals from the oil pressure switch and transmits the oil pressure switch signal to the combination meter via BCM with the CAN communication.
Oil pressure switch	Refer to MWI-41, "Description".
BCM	Transmits the oil pressure switch signal received from IPDM E/R via CAN communication to the combination meter via CAN communication.

METER ILLUMINATION CONTROL

METER ILLUMINATION CONTROL : System Diagram

INFOID:0000000001193741



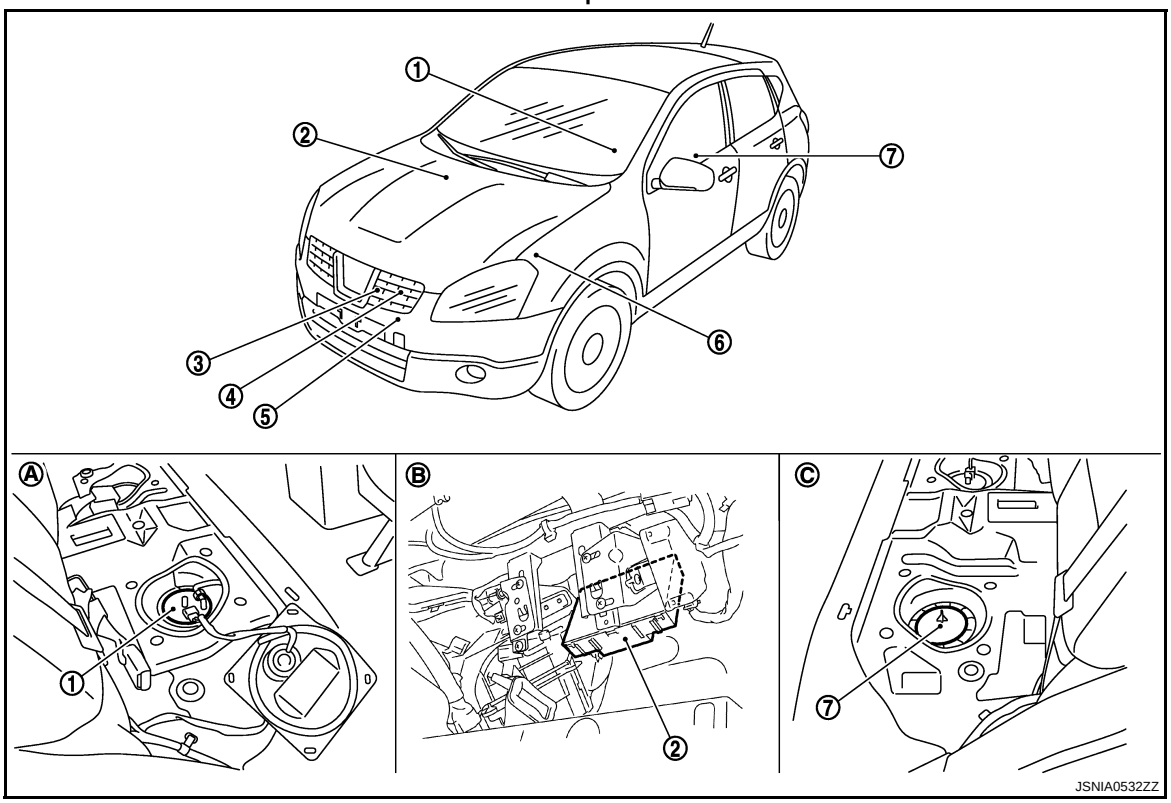
METER ILLUMINATION CONTROL : System Description

INFOID:0000000001193742

The combination meter controls the meter illumination according to the position light request signal transmitted from BCM via CAN communication and the signal from switch joined with the combination meter.

METER ILLUMINATION CONTROL : Component Parts Location

INFOID:0000000001470343



1. Fuel level sensor unit (main)
2. BCM
3. OAT sensor
4. Oil pressure switch
5. Oil level sensor
6. IPDM E/R
7. Fuel level sensor unit (sub)

A. Lower right side of rear seat
B. Over the glove box
C. Lower left side of rear seat (4WD models)

METER ILLUMINATION CONTROL : Component Description

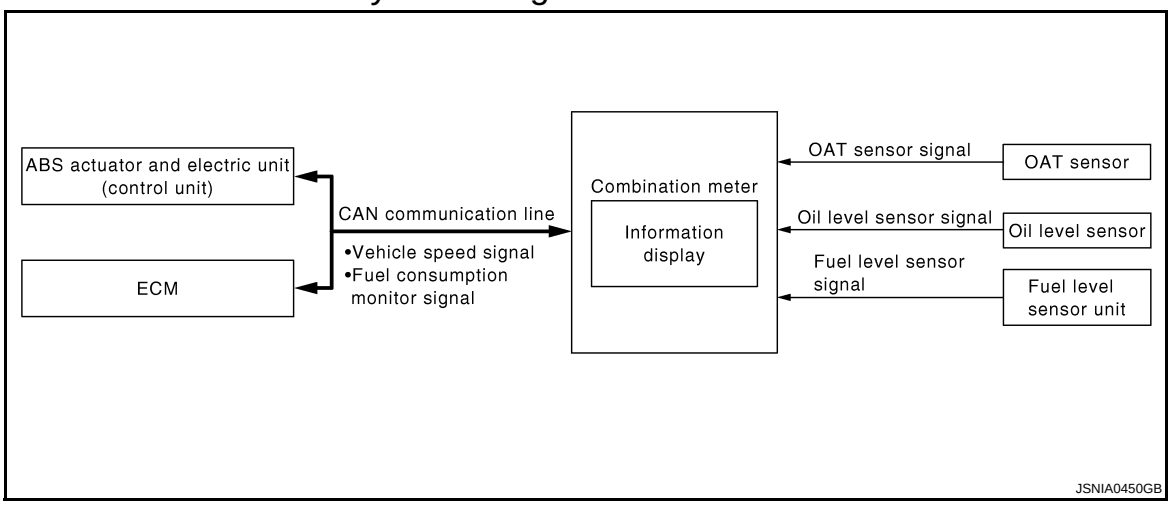
INFOID:0000000001193744

Unit	Description
Combination meter	Controls the meter illumination according to the position light request signal transmitted from BCM via CAN communication and the signal from switch integrated with the combination meter.
BCM	Transmits the position light request signal to the combination meter via CAN communication.

INFORMATION DISPLAY

INFORMATION DISPLAY : System Diagram

INFOID:0000000001193745



INFORMATION DISPLAY : System Description

INFOID:0000000001193746

DESCRIPTION

The combination meter incorporates a trip computer that displays the information according to the signal received from various units.

MAINTENANCE

The remaining distance from the set maintenance distance is displayed.

Items	Setting range	Setting unit	Description
Maintenance	0 – 63000 km (0 – 31500 miles)	1000 km (500 miles)	The remaining distance from the set distance is displayed for 5 seconds after the ignition switch is turned ON.

- If setting range zero (0) is selected, then the maintenance information does not function.
- In this case, the maintenance information is not shown when turning ignition switch ON.
- The setup mode can be entered, within 5 seconds after turning ignition switch ON.

Refer to MWI-7, "METER SYSTEM : System Description" for the operation and setting of engine oil maintenance.

OIL LEVEL

The combination meter displays it judged with the oil level signal received from the oil level sensor.

NOTE:

Oil level is not displayed after installation/removal of battery or combination meter. To display the oil level again, follow the steps below.

1. More than 5 minutes after turning ignition switch OFF, open the driver's door.
2. Turn ignition switch ON.

CLOCK

Clock displays the time measured in the combination meter.

AVERAGE FUEL CONSUMPTION

- The combination meter receives the fuel consumption monitor signal from ECM and the vehicle speed signal from the ABS actuator and electric unit (control unit) via CAN communication.
- The combination meter indicates the average fuel consumption calculated by the signal received.
- The average fuel consumption displayed on the information display is uploaded at approximately 30-second intervals.

AVERAGE VEHICLE SPEED

- The combination meter receives the vehicle speed signal from the ABS actuator and electric unit (control unit) with the CAN communication line.

- The combination meter indicates the average vehicle speed according to the vehicle speed signal received and the time measured in the combination meter.
- The average vehicle speed displayed on the information display is uploaded at approximately 30-second intervals.

TRAVEL TIME

Measures the driving time (ignition switch ON time) in the combination meter and displays it.

ODO/TRIP METER

- The combination meter receives the vehicle speed signal from the ABS actuator and electric unit (control unit) with the CAN communication line.
- The combination meter indicates the travel distance calculated by the vehicle speed signal received.

POSSIBLE DRIVING DISTANCE

- Combination meter receives the fuel consumption signals from ECM and the vehicle speed signals from ABS actuator and electric unit (control unit) with the CAN communication line.
- Combination meter calculates the possible driving distance from the signals through CAN communication line and the fuel level signals from the fuel level sensor to display.

AMBIENT AIR TEMPERATURE

- The combination meter indicates the ambient air temperature calculated by the OAT sensor signal received from the OAT sensor.
- The indicated temperature is corrected by the ignition switch signal, the OAT sensor detection temperature, and the vehicle speed signal. It does not increase if the vehicle speed is less than 20 km/h (12.4 MPH).
- It switches the ambient air temperature to the blinking display when the ambient air temperature 3°C (37°F) or less continues for 20 seconds or more (road ice warning).

Correction Process (Ignition Switch OFF → ON)

The OAT sensor detection temperature is not displayed in real time if all of the following conditions are fulfilled. The indicated temperature before the ignition switch OFF is displayed.

- The ignition switch OFF time is less than 3.5 hours.
- The OAT sensor detection temperature is higher than the indicated temperature before the ignition switch OFF.

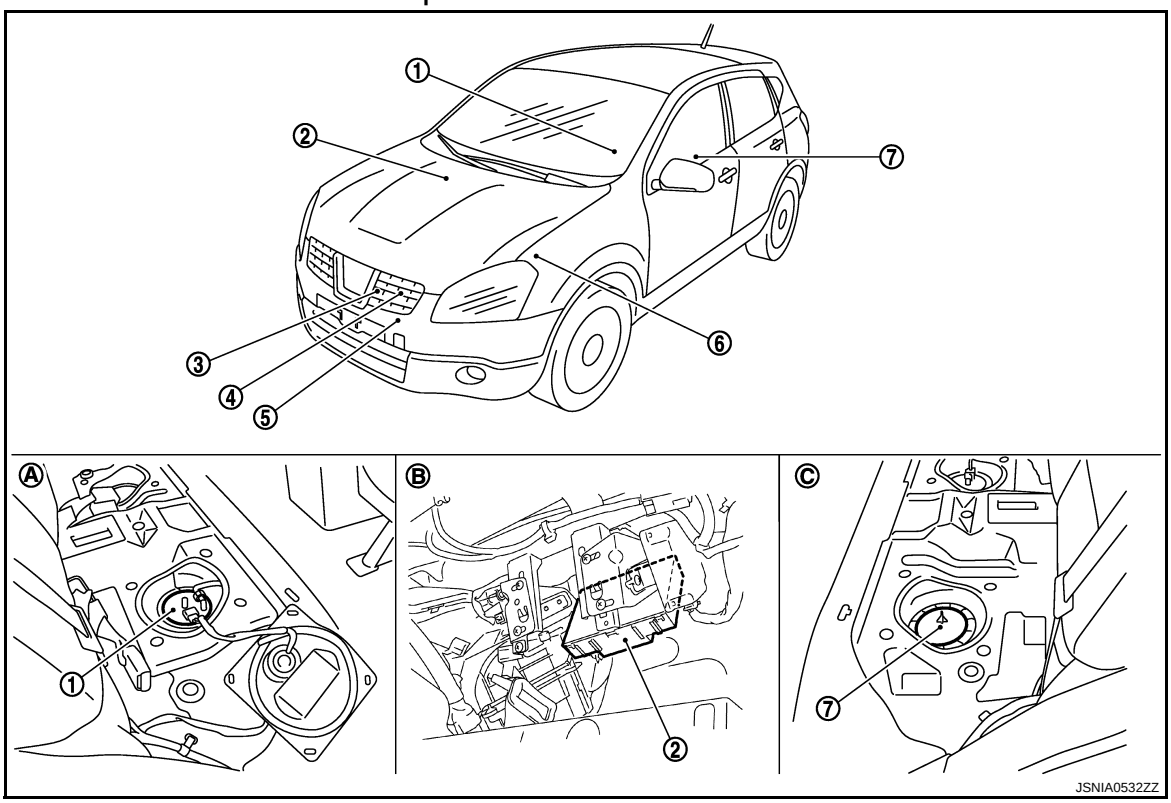
Correction Process (Ignition Switch ON)

Perform the following correction if the OAT sensor detection temperature is higher than the indicated temperature when the vehicle speed is 20 km/h (12.4 MPH) or more.

- Shorten the update time of the indicated temperature according to the increase of the vehicle speed.

INFORMATION DISPLAY : Component Parts Location

INFOID:0000000001470344



1. Fuel level sensor unit (main)
2. BCM
3. OAT sensor
4. Oil pressure switch
5. Oil level sensor
6. IPDM E/R
7. Fuel level sensor unit (sub)

A. Lower right side of rear seat
B. Over the glove box
C. Lower left side of rear seat (4WD models)

INFORMATION DISPLAY : Component Description

INFOID:0000000001193748

Unit	Description
Combination meter	Controls the information display according to the signal received from each unit.
Fuel level sensor unit	Refer to MWI-36, "2WD : Description" (2WD) or MWI-38, "4WD : Description" (4WD).
ECM	Transmits the following signals to the combination meter via CAN communication line. • Engine speed signal • Engine coolant temperature signal • Fuel consumption monitor signal
ABS actuator and electric unit (control unit)	Transmits the vehicle speed signal to the combination meter via CAN communication line.
BCM	Transmits signals provided by various units to the combination meter via CAN communication line.
OAT sensor	Detects the ambient temperature and transmits the OAT sensor signal to the combination meter.
Oil level sensor	Refer to MWI-32, "Description".

DIAGNOSIS SYSTEM (METER)

Diagnosis Description

INFOID:0000000001193749

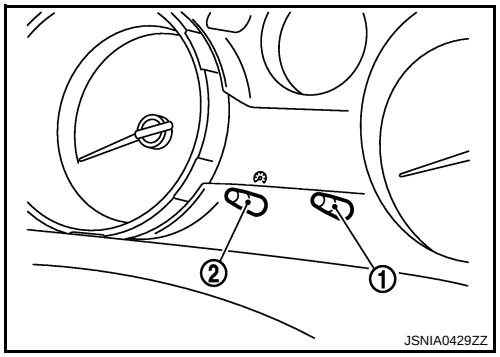
ON BOARD DIAGNOSIS

The combination meter can be checked on the following items with the on board diagnosis function.

- Check the segment of information display
- Check the operations of speedometer and tachometer
- Check error code
- Check the warning lamp/indicator lamp for illumination

START-UP PROCEDURE OF ON BOARD DIAGNOSIS

1. Turn the ignition switch ON.
2. Turn the ignition switch OFF after setting the display to “trip A” or “trip B” with trip switch (1).
3. Turn the ignition switch to ON while pressing the switch (2).
4. Press and hold the switch for 3 seconds or more.
5. Press the switch at least 3 times (Within 7 seconds after the ignition switch is turned ON).

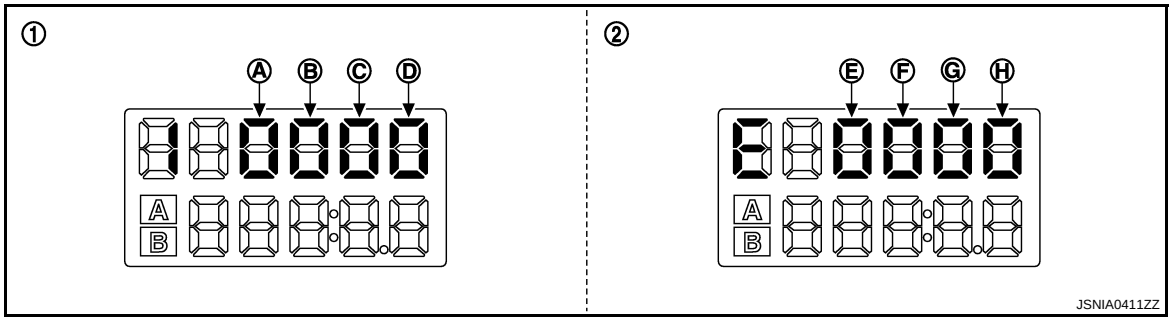


6. The combination meter on board diagnosis mode starts.
7. Press the switch to go to the next step.
   NOTE:
   Check the combination meter power supply and the ground circuit if the on board diagnosis does not start. Refer to MWI-34, "COMBINATION METER : Diagnosis Procedure".

Diagnosis item

Step	Diagnosis item	Description
1	Segment check	Illuminates all segments in the information display. **NOTE:** Replace the combination meter if any segment is not illuminated.
2	Work instruction code	This information is not used for service. Skip this step.
3	Software code	This information is not used for service. Skip this step.
4	EEPROM code	This information is not used for service. Skip this step.
5	Hardware code	This information is not used for service. Skip this step.
6	P.C.D code	This information is not used for service. Skip this step.
7	Pointer operation check (Sweeping movement)	Can check the pointer operation of speedometer and tachometer. **NOTE:** Replace the combination meter if any pointer does not move.
8	Error code 1	Displays error code.
9	Error code 2	Displays error code.
10	Warning lamp/Indicator lamp illumination check	Illuminates the warning lamp/indicator lamp. **NOTE:** • If any of lamps controlled by combination meter is not illuminated, replace combination meter. • Air bag warning lamp and security indicator lamp does not illuminated.

ERROR CODE



1. Error code 1
2. Error code 2

Items		Code	Description	Action/Reference
(A)	Engine coolant temperature gauge	0	No malfunction detected	—
		1	If the engine coolant temperature signal cannot be received from ECM for 2 seconds or more	Perform “Self Diagnostic Result” of ECM Refer to the following • ECH-89 [HR16DE (With EURO-OBD)] • ECH-419 [HR16DE (Without EURO-OBD)] • ECM-91 [MR20DE (With EURO-OBD)] • ECM-425 [MR20DE (Without EURO-OBD)] • ECK-63 (K9K) • ECR-101 (M9R)
(B)	Fuel gauge	0	No malfunction detected	—
		1	If it is judged that the fuel level sensor unit signal circuit is short-circuited for 120 seconds or more	Refer to the following • MWI-36 (2WD) • MWI-38 (4WD)
		2	If it is judged that the fuel level sensor unit signal circuit is open-circuited for 120 seconds or more	
(C)	Tachometer	0	No malfunction detected	—
		1	If the engine speed signal cannot be received from ECM for 2 seconds or more	Perform “Self Diagnostic Result” of ECM Refer to the following • ECH-89 [HR16DE (With EURO-OBD)] • ECH-419 [HR16DE (Without EURO-OBD)] • ECM-91 [MR20DE (With EURO-OBD)] • ECM-425 [MR20DE (Without EURO-OBD)] • ECK-63 (K9K) • ECR-101 (M9R)
(D)	Speedometer	0	No malfunction detected	—
		1	If the vehicle speed signal cannot be received from the ABS actuator and electric unit (control unit) for 2 seconds or more	Perform “Self Diagnostic Result” of ABS actuator and electric unit (control unit) Refer to the following • BRC-17 (Without ESP system) • BRC-95 (With ESP system)
		2	If the abnormal vehicle speed signal is input from ABS actuator and electric unit (control unit) for 2 seconds or more	
(E)	—	0	“0” is always displayed	—
(F)	—	0	“0” is always displayed	—
(G)	Ambient air temperature	0	No malfunction detected	—
		1	If it is judged that the OAT sensor signal circuit is short-circuited for 4 seconds or more	Refer to MWI-42, "Diagnosis Procedure"
		2	If it is judged that the OAT sensor signal circuit is open-circuited for 4 seconds or more	

Items		Code	Description	Action/Reference
(H)	• switch • Trip switch	0	No malfunction detected	—
		1	If it is judged that the switch signal circuit is short-circuited for 5 minutes or more	Replace the combination meter
		2	If it is judged that the trip switch signal circuit is short-circuited for 5 minutes or more	
		3	If it is judged that the switch and trip switch signal circuits are short-circuited	

CONSULT-III Function (METER/M&A)

INFOID:0000000001193750

CONSULT-III FUNCTION (METER/M&A)

System	Diagnosis mode	Description
METER/M&A	Self Diagnostic Result	Combination meter checks the conditions and displays memorized error.
	Data Monitor	Displays combination meter input/output data in real time.

SELF DIAG RESULT

Refer to MWI-57, "DTC Index".

DATA MONITOR

Display Item List

X: Applicable

Display item [Unit]	MAIN SIGNALS	Description
SPEED METER [km/h]	X	Value of vehicle speed signal received from ABS actuator and electric unit (control unit) with CAN communication line. **NOTE:** 655.35 is displayed when the malfunction signal is received.
SPEED OUTPUT [km/h]	X	Vehicle speed signal value transmitted to other units with CAN communication line. **NOTE:** 655.35 is displayed when the malfunction signal is received.
TACHO METER [rpm]	X	Value of the engine speed signal received from ECM with CAN communication line. **NOTE:** 8191.875 is displayed when the malfunction signal is received.
W TEMP METER [°C]	X	Value of engine coolant temperature signal received from ECM with CAN communication line. **NOTE:** 215 is displayed when the malfunction signal is input.
FUEL METER [lit.]	X	Fuel level indicated on combination meter.
DISTANCE [km]	X	Value of possible driving distance calculated by combination meter.
FUEL W/L [On/Off]	X	Low-fuel warning status judged by the identified fuel level.
C -ENG W/L [On/Off]		Status of malfunction indicator lamp judged from malfunctioning indicator lamp signal received from ECM with CAN communication line.
SEAT BELT W/L [On/Off]		Status of front seat belt buckle switch (driver side).
BUZZER [On/Off]	X	Buzzer status (in the combination meter) judged with the buzzer output signal received from BCM via CAN communication and the warning output condition of the combination meter.
C -ENG2 W/L [On/Off]		Status of malfunction indicator lamp 2 judged from malfunctioning indicator lamp signal received from ECM with CAN communication line.

Display item [Unit]	MAIN SIGNALS	Description
GLOW IND [On/Off]		Glow indicator lamp status judged from glow indicator lamp signal received from ECM with the CAN communication line.
DOOR W/L [On/Off]		Status of door warning judged from door switch signal received from BCM with CAN communication line.
HI -BEAM IND [On/Off]		Status of high beam indicator lamp judged from high beam request signal received from BCM with CAN communication line.
TURN IND [On/Off]		Status of turn indicator lamp judged from turn indicator signal received from BCM with CAN communication line.
FR FOG IND [On/Off]		Status of front fog light indicator lamp judged from front fog light request signal received from BCM with CAN communication line.
RR FOG IND [On/Off]		Status of rear fog light indicator lamp judged from rear fog light request signal received from BCM with CAN communication line.
OIL W/L [On/Off]		Status of oil pressure warning lamp judged from oil pressure switch signal received from IPDM E/R with CAN communication line.
LIGHT IND [On/Off]		Status of light indicator lamp judged from position light request signal received from BCM with CAN communication line.
DPF W/L [On/Off]		DPF warning lamp status judged by the DPF warning lamp signal received from ECM with the CAN communication line.
A/T TEMP W/L [On/Off]		A/T TEMP warning lamp status judged by the A/T fluid temperature sensor signal received from TCM with the CAN communication line.
VDC/TCS IND [On/Off]		Status of VDC indicator lamp judged from VDC OFF indicator lamp signal received from ABS actuator and electric unit (control unit) with CAN communication line.
ABS W/L [On/Off]		Status of ABS warning lamp judged from ABS warning lamp signal received from ABS actuator and electric unit (control unit) with CAN communication line.
SLIP IND [On/Off]		Status of slip indicator lamp judged from slip indicator lamp signal received from ABS actuator and electric unit (control unit) with CAN communication line.
BRAKE W/L [On/Off]		Status of brake warning lamp judged from brake warning lamp signal received from ABS actuator and electric unit (control unit) with CAN communication line. **NOTE:** Displays “Off” if the brake warning lamp is illuminated when the valve check starts, the parking brake switch is turned ON or the brake fluid level switch is turned ON.
OIL LEVEL IND [LEVEL1, 2, 3, 4, 5/CR NG/On]		Oil level status judged by the oil level sensor signal from the oil level sensor.
KEY G W/L [On/Off]		Status of key warning lamp (G) judged from key warning signal received from Intelligent Key unit with CAN communication line.
KEY R W/L [On/Off]		Status of key warning lamp (R) judged from key warning signal received from Intelligent Key unit with CAN communication line.
KEY KNOB W/L [On/Off]		Key knob switch status received from Intelligent Key unit with the CAN communication line.
M RANGE SW [On/Off]	X	Status of mode select switch (manual).
NM RANGE SW [On/Off]	X	Status of mode select switch (auto).
AT SFT UP SW [On/Off]	X	Status of position select switch (up).
AT SFT DWN SW [On/Off]	X	Status of position select switch (down).

Display item [Unit]	MAIN SIGNALS	Description
P RANGE IND [On/Off]	X	Status of shift position indicator judged from shift position signal and manual mode indicator signal received from TCM with CAN communication line.
R RANGE IND [On/Off]	X	
N RANGE IND [On/Off]	X	
D RANGE IND [On/Off]	X	
4 RANGE IND [On/Off]	X	
3 RANGE IND [On/Off]	X	
2 RANGE IND [On/Off]	X	
1 RANGE IND [On/Off]	X	
AT CHECK W/L [On/Off]		A/T check warning lamp status judged by the A/T CHECK indicator lamp signal received from TCM with the CAN communication line.
CVT IND [On/Off]		CVT indicator lamp status judged from CVT CHECK indicator lamp signal received from TCM with the CAN communication line.
CRUISE IND [On/Off]		Status of CRUISE indicator judged from ASCD CRUISE lamp signal received from ECM with CAN communication line.
SET IND [On/Off]		Status of set indicator judged from ASCD SET indicator signal received from ECM with CAN communication line.
4WD LOCK SW [On/Off]		4WD lock switch status judged by the 4WD signal received from 4WD control unit with the CAN communication line.
4WD LOCK IND [On/Off]		4WD lock indicator status judged by the 4WD signal received from 4WD control unit with the CAN communication line.
4WD W/L [On/Off]		Status of 4WD warning lamp judged from 4WD warning lamp signal received from 4WD control unit with CAN communication line.
EPS W/L [On/Off]		Status of EPS warning lamp judged from EPS warning lamp signal received from EPS control unit with CAN communication line.

NOTE:

Some items are not available according to vehicle specification.

COMPONENT DIAGNOSIS

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000001193751

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, 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 line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
Refer to LAN-28, "CAN Communication Signal Chart".

DTC Logic

INFOID:0000000001193752

DTC DETECTION LOGIC

DTC	Display contents of CONSULT-III	Diagnostic item is detected when ...	Probable malfunction location
U1000	CAN COMM CIRCUIT	When combination meter is not transmitting or receiving CAN communication signal for 2 seconds or more.	CAN communication system

Diagnosis Procedure

INFOID:0000000001193753

1.PERFORM SELF-DIAGNOSIS OF COMBINATION METER

1. Turn ignition switch ON and wait for 2 seconds or more.
2. Perform “Self Diagnostic Result” of combination meter.

Is “CAN COMM CIRCUIT” displayed?

YES >> Refer to LAN-13, "Trouble Diagnosis Flow Chart".
NO >> Refer to GI-39, "Intermittent Incident".

B2205 VEHICLE SPEED

Description

INFOID:0000000001193754

Vehicle speed signal is transmitted from ABS actuator and electric unit (control unit) via CAN communication line to combination meter.

DTC Logic

INFOID:0000000001193755

DTC DETECTION LOGIC

DTC	Display contents of CONSULT-III	Diagnostic item is detected when ...	Probable malfunction location
B2205	VEHICLE SPEED	The abnormal vehicle speed signal is input from ABS actuator and electric unit (control unit) for 2 seconds or more.	ABS actuator and electric unit (control unit)

Diagnosis Procedure

INFOID:0000000001193756

1.PERFORM SELF-DIAGNOSIS OF ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform “Self Diagnostic Result” of ABS actuator and electric unit (control unit), and repair or replace malfunctioning parts.

>> Refer to the following.
- BRC-17, "CONSULT-III Function (ABS)" (Without ESP system)
- BRC-95, "CONSULT-III Function (ABS)" (With ESP system).

B2321, B2322 OIL LEVEL SENSOR

Description

INFOID:0000000001193768

Transmits the oil level sensor signal to the combination meter.

DTC Logic

INFOID:0000000001524911

DTC DETECTION LOGIC

DTC	Display contents of CONSULT-III	Diagnostic item is detected when ...	Probable malfunction location
B2321	OIL LEV SEN OPEN	Combination meter judged that the oil level sensor unit signal circuit is open-circuited for 1 second or more.	• Oil level sensor circuit • Oil level sensor
B2322	OIL LEV SEN SHORT	Combination judged that the oil level sensor unit signal circuit is short-circuited for 1 second or more.	

Diagnosis Procedure (HR16DE Engine Models)

INFOID:0000000001193769

1.CHECK OIL LEVEL SENSOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and oil level sensor unit connector.
3. Check continuity between combination meter harness connector terminals 32, 33 and oil level sensor unit harness connector terminals 1, 3.

32 – 1	: Continuity should exist.
33 – 3	: Continuity should exist.

4. Check continuity between combination meter harness connector terminal 32 and ground.

32 – Ground	: Continuity should not exist.

Is the inspection result normal?

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

Diagnosis Procedure (Except HR16DE Engine Models)

INFOID:0000000001451355

1.CHECK OIL LEVEL SENSOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and oil level sensor unit connector.
3. Check continuity between combination meter harness connector terminals 32, 33 and oil level sensor unit harness connector terminals 1, 2.

32 – 1	: Continuity should exist.
33 – 2	: Continuity should exist.

4. Check continuity between combination meter harness connector terminal 32 and ground.

32 – Ground	: Continuity should not exist.

Is the inspection result normal?

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

Component Inspection (HR16DE Engine Models)

INFOID:0000000001193770

1.CHECK OIL LEVEL SENSOR UNIT

1. Turn ignition switch OFF.
2. Disconnect oil level sensor connector.
3. Check resistance between oil level sensor terminals 1 and 3.

1 – 3	: 3 – 20 Ω

Is inspection result OK?

YES >> INSPECTION END
NO >> Replace oil level sensor.

Component Inspection (Except HR16DE Engine Models)

INFOID:0000000001451356

1. CHECK OIL LEVEL SENSOR UNIT

1. Turn ignition switch OFF.
2. Disconnect oil level sensor connector.
3. Check resistance between oil level sensor terminals 1 and 2.

1 – 2	: 3 – 20 Ω

Is inspection result OK?

YES >> INSPECTION END
NO >> Replace oil level sensor.

POWER SUPPLY AND GROUND CIRCUIT
COMBINATION METER

COMBINATION METER : Diagnosis Procedure

INFOID:0000000001193757

1.CHECK FUSE

Check for blown fuses.

Terminal No.	Signal name	Fuse No.
1	Battery power supply	8
2	Ignition signal	4

Is the inspection result normal?

YES >> GO TO 2.
NO >> Be sure to eliminate cause of malfunction before installing new fuse.

2.CHECK POWER SUPPLY CIRCUIT

Check voltage between combination meter harness connector terminals 1, 2 and ground.

Terminals			Ignition switch position	
(+)		(–)		
Combination meter			OFF	ON
Connector	Terminal			
M34	1	Ground	Battery voltage	Battery voltage
	2		Approx. 0 V	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Check harness between combination meter and fuse.

3.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector.
3. Check continuity between combination meter harness connector terminals 3, 23 and ground.

Combination meter		Ground	Continuity
Connector	Terminal		
M34	3		Existed
	23		

Is the inspection result normal?

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

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

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

INFOID:0000000001193758

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	D (with gasoline engine)
		B (with diesel engine)
2		C (with gasoline engine)
		D (with diesel engine)
53		L (except HR engine models)
		M (HR engine models)

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 connector.
3. Check voltage between IPDM E/R harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
IPDM E/R			
Connector	Terminal		
E9	1	Ground	Battery voltage
	2		
E14	53		

Is the measurement value normal?

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

3.CHECK GROUND CIRCUIT

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

IPDM E/R			Continuity
Connector	Terminal	Ground	
E10	5		Exist
	6		

Does continuity exist?

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

FUEL LEVEL SENSOR SIGNAL CIRCUIT

2WD

2WD : Description

INFOID:0000000001193759

The fuel level sensor (main) detect the fuel level in the fuel tank and transmit the fuel level sensor signal to the combination meter.

2WD : Component Function Check

INFOID:0000000001193760

1.CHECK COMBINATION METER INPUT SIGNAL

Select the “Data Monitor” for the “METER/M&A” and compare the “FUEL METER” monitor value with the fuel gauge reading on the combination meter.

Fuel gauge indication position (segment illumination position)	Monitor value [lit]
F (13/13)	Approx. 65
3/4 (10/13)	Approx. 53 - 58
1/2 (7/13)	Approx. 38 - 43
1/4 (4/13)	Approx. 23 - 28
E (0/13)	Less than 8

Does monitor value match fuel gauge reading?

YES >> INSPECTION END
NO >> Replace combination meter.

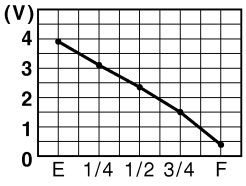
2WD : Diagnosis Procedure

INFOID:0000000001193761

1.CHECK COMBINATION METER INPUT SIGNAL

1. Turn ignition switch ON.
2. Check voltage between combination meter harness connector terminal 34 and ground.

34 – Ground :



JSNIA0322GB

Does it match fuel gauge reading?

YES >> GO TO 2.
NO >> Replace combination meter.

2.CHECK FUEL LEVEL SENSOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and fuel level sensor unit (main) connector.
3. Check continuity between combination meter harness connector terminal 34 and fuel level sensor unit (main) harness connector terminal 4*1 or 5*2.

34 – 4*1or 5*2 : Continuity should exist.

NOTE:
*1: Except M9R engine
*2: M9R engine

4. Check continuity between combination meter harness connector terminal 34 and ground.

34 – Ground : Continuity should not exist.

Is the inspection result normal?

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

3.CHECK FUEL LEVEL SENSOR GROUND CIRCUIT

Check continuity between fuel level sensor unit (main) harness connector terminal 2 and combination meter harness connector terminal 24.

2 – 24 : Continuity should exist

Is the inspection result normal?

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

2WD : Component Inspection [Fuel Level Sensor Unit (Main)]

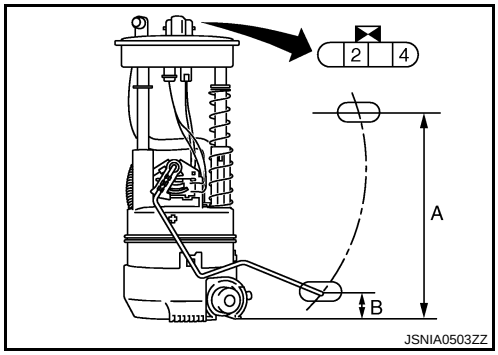
INFOID:0000000001193762

1.CHECK FUEL LEVEL SENSOR UNIT (MAIN)

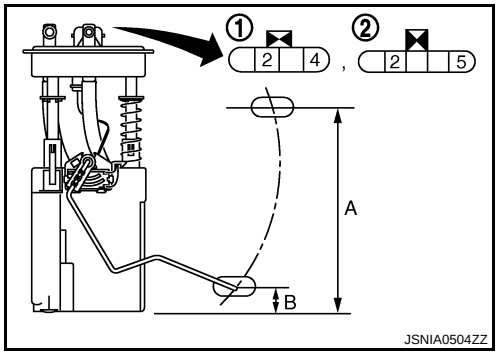
1. Check the resistance between fuel level sensor unit (main) terminals.

2 – 4*1 or 5*2
Full (A) : Approx. 4 Ω
Empty (B) : Approx. 82 Ω

NOTE:
*1: Except M9R engine
*2 :M9R engine



HR16/MR20DE



1. K9K 2. M9R

2. Check the standard float position

Full [mm (in)] : Approx. 213 (8.39)
Empty [mm (in)] : Approx. 21.5 (0.85)

Is inspection result OK?

YES >> INSPECTION END
NO >> Replace fuel level sensor unit (main).

4WD

4WD : Description

INFOID:0000000001193763

The fuel level sensor (main) and the fuel level sensor (sub) detect the fuel level in the fuel tank and transmit the fuel level sensor signal to the combination meter.

4WD : Component Function Check

INFOID:0000000001193764

1.CHECK COMBINATION METER INPUT SIGNAL

Select the “Data Monitor” for the “METER/M&A” and compare the “FUEL METER” monitor value with the fuel gauge reading on the combination meter.

Fuel gauge indication position (segment illumination position)	Monitor value [lit]
F (13/13)	Approx. 65
3/4 (10/13)	Approx. 53 - 58
1/2 (7/13)	Approx. 38 - 43
1/4 (4/13)	Approx. 23 - 28
E (0/13)	Less than 8

Does monitor value match fuel gauge reading?

YES >> INSPECTION END
NO >> Replace combination meter.

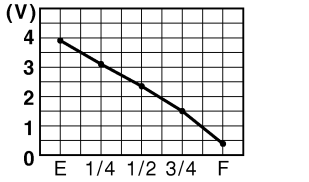
4WD : Diagnosis Procedure

INFOID:0000000001193765

1.CHECK COMBINATION METER INPUT SIGNAL

1. Turn ignition switch ON.
2. Check voltage between combination meter harness connector terminal 34 and ground.

34 – Ground :



JSNIA0322GB

Does it match fuel gauge reading?

YES >> GO TO 2.
NO >> Replace combination meter.

2.CHECK FUEL LEVEL SENSOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and fuel level sensor unit (main) connector.
3. Check continuity between combination meter harness connector terminal 34 and fuel level sensor unit (main) harness connector terminal 4*1 or 5*2.

34 – 4*1 or 5*2 : Continuity should exist.

NOTE:
*1: Except M9R engine
*2: M9R engine

4. Check continuity between combination meter harness connector terminal 34 and ground.

34 – Ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3.CHECK FUEL LEVEL SENSOR GROUND CIRCUIT

Check continuity between fuel level sensor unit (main) harness connector terminal 2 and combination meter harness connector terminal 24.

2 – 24	: Continuity should exist

Is the inspection result normal?

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

4WD : Component Inspection [Fuel Level Sensor Unit (Main)]

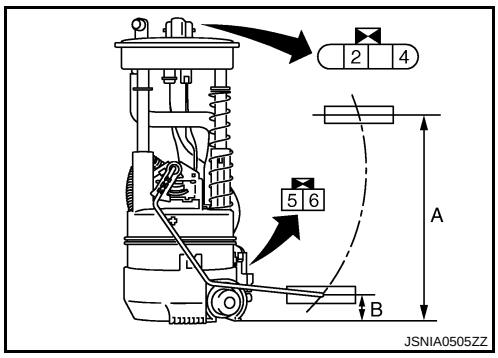
INFOID:0000000001193766

1.CHECK FUEL LEVEL SENSOR UNIT (MAIN)

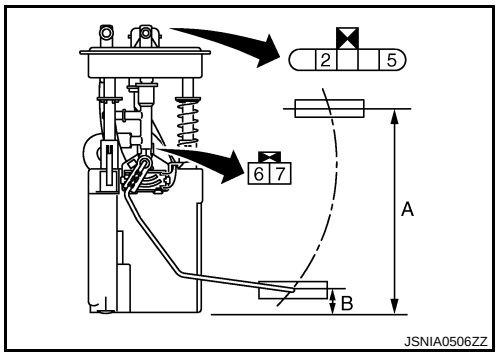
1. Check the resistance between fuel level sensor unit (main) terminals.

2 – 5*1 or 6*2	
Full (A)	: Approx. 1.3 Ω
Empty (B)	: Approx. 82 Ω

NOTE:
*1: MR20DE engine
*2: M9R engine



MR20DE



M9R

2. Check the standard float position

Full [mm (in)]	: Approx. 188.5 (7.42)
Empty [mm (in)]	: Approx. 23.5 (0.93)

Is inspection result OK?

YES >> INSPECTION END
NO >> Replace fuel level sensor unit (main).

4WD : Component Inspection [Fuel Level Sensor Unit (Sub)]

INFOID:0000000001193767

1.CHECK FUEL LEVEL SENSOR UNIT (SUB)

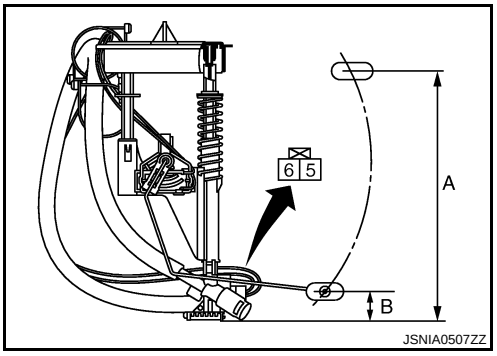
1. Check the resistance between fuel level sensor unit (main) terminals.

5*1 or 6*2 – 6*1 or 7*2	
Full (A)	: Approx. 1.3 Ω
Empty (B)	: Approx. 50.5 Ω

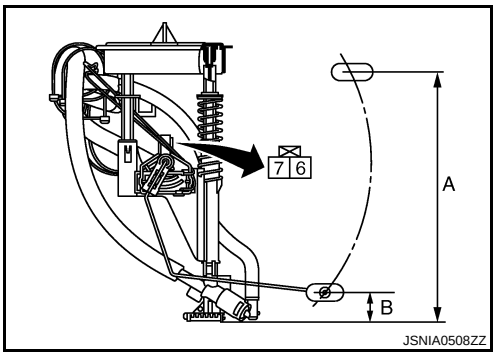
NOTE:

*1: MR20DE engine

*2: M9R engine



MR20DE



M9R

2. Check the standard float position

Full [mm (in)]	: Approx. 229.5 (9.04)
Empty [mm (in)]	: Approx. 42.5 (1.67)

Is inspection result OK?

YES >> INSPECTION END

NO >> Replace fuel level sensor unit (sub).

OIL PRESSURE SWITCH SIGNAL CIRCUIT

Description

INFOID:0000000001193771

Detects the engine oil pressure and transmits the oil pressure switch signal to IPDM E/R.

Component Function Check

INFOID:0000000001193772

1.CHECK COMBINATION METER INPUT SIGNAL

Select the “Data Monitor” for the “METER/M&A” and check the “OIL W/L” monitor value.

OIL W/L	
Ignition switch ON	: On
Engine running	: Off

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000001193773

1.CHECK OIL PRESSURE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and oil pressure switch connector.
3. Check continuity between IPDM E/R harness connector terminal 27 and oil pressure switch harness connector terminal 1.

27 – 1	: Continuity should exist.

4. Check continuity between IPDM E/R harness connector terminal 27 and ground.

27 – Ground	: Continuity should not exist.

Is the inspection result normal?

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

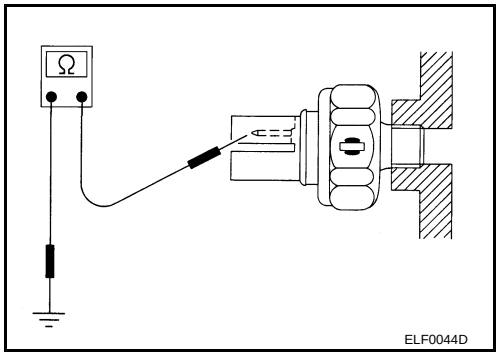
Component Inspection

INFOID:0000000001193774

1.CHECK OIL PRESSURE SWITCH UNIT

Check continuity between oil pressure switch and ground.

Condition	Oil pressure [kPa (bar, kg/cm^2, psi)]	Continuity
Engine stopped	Less than 29 (0.3, 0.3, 4)	Existed
Engine running	29 or more (0.3, 0.3, 4)	Not existed



Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the oil pressure switch.

OAT SENSOR SIGNAL CIRCUIT

Description

INFOID:0000000001193775

The OAT sensor is attached on the radiator core support (left side). It detects ambient air temperature and converts it into a resistance value which is then input into the combination meter.

Diagnosis Procedure

INFOID:0000000001193776

1.CHECK OAT SENSOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and OAT sensor connector.
3. Check continuity between combination meter harness connector terminal 19 and OAT sensor harness connector terminal 2.

19 – 2	: Continuity should exist.

4. Check continuity between combination meter harness connector terminal 19 and ground.

19 – Ground	: Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector.

2.CHECK OAT SENSOR GROUND CIRCUIT

1. Check continuity between combination meter harness connector terminal 20 and OAT sensor harness connector terminal 1.

20 – 1	: Continuity should exist.

2. Check continuity between combination meter harness connector terminal 20 and ground.

20 – Ground	: Continuity should not exist.

Is the inspection result normal?

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

Component Inspection

INFOID:0000000001319313

1.CHECK OAT SENSOR

Check resistance between OAT sensor terminals 1 and 2.

Temperature [°C (°F)]	Resistance (kΩ)
–30 (–22)	13.33
–20 (–4)	7.89
–10 (14)	4.80
0 (32)	6.19
5 (41)	1.81
10 (50)	1.16
20 (68)	0.77
30 (86)	0.52
40 (104)	0.36

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace OAT sensor.

ECU DIAGNOSIS

COMBINATION METER

Reference Value

INFOID:0000000001193778

VALUES ON THE DIAGNOSIS TOOL

Monitor Item	Condition		Value/Status
SPEED METER [km/h]	Ignition switch ON	While driving	Equivalent to speedometer reading **NOTE:** 655.35 is displayed when the malfunction signal is received
SPEED OUTPUT [km/h]	Ignition switch ON	While driving	Equivalent to speedometer reading **NOTE:** 655.35 is displayed when the malfunction signal is received
TACHO METER [rpm]	Ignition switch ON	While driving	Equivalent to tachometer reading **NOTE:** 8191.875 is displayed when the malfunction signal is received
W TEMP METER [°C]	Ignition switch ON	—	Values according to engine coolant temperature **NOTE:** 215 is displayed when the malfunction signal is input
FUEL METER [lit]	Ignition switch ON	—	Values according to fuel level
DISTANCE [km]	Ignition switch ON	—	Possible driving distance calculated by combination meter
FUEL W/L	Ignition switch ON	Low-fuel warning lamp ON	On
		Low-fuel warning lamp OFF	Off
C-ENG W/L	Ignition switch ON	Malfunction indicator lamp ON	On
		Malfunction indicator lamp OFF	Off
SEAT BELT W/L	Ignition switch ON	Seat belt warning lamp ON	On
		Seat belt warning lamp OFF	Off
BUZZER	Ignition switch ON	Buzzer ON	On
		Buzzer OFF	Off
C-ENG 2 W/L	Ignition switch ON	Malfunction indicator lamp 2 ON	On
		Malfunction indicator lamp 2 OFF	Off
GLOW IND	Ignition switch ON	Glow indicator lamp ON	On
		Glow indicator lamp OFF	Off
DOOR W/L	Ignition switch ON	Door warning lamp ON	On
		Door warning lamp OFF	Off
HI-BEAM IND	Ignition switch ON	High-beam indicator lamp ON	On
		High-beam indicator lamp OFF	Off
TURN IND	Ignition switch ON	Turn signal indicator lamp ON	On
		Turn signal indicator lamp OFF	Off
FR FOG IND	Ignition switch ON	Front fog lamp indicator lamp ON	On
		Front fog lamp indicator lamp OFF	Off
RR FOG IND	Ignition switch ON	Rear fog lamp indicator lamp ON	On
		Rear fog lamp indicator lamp OFF	Off

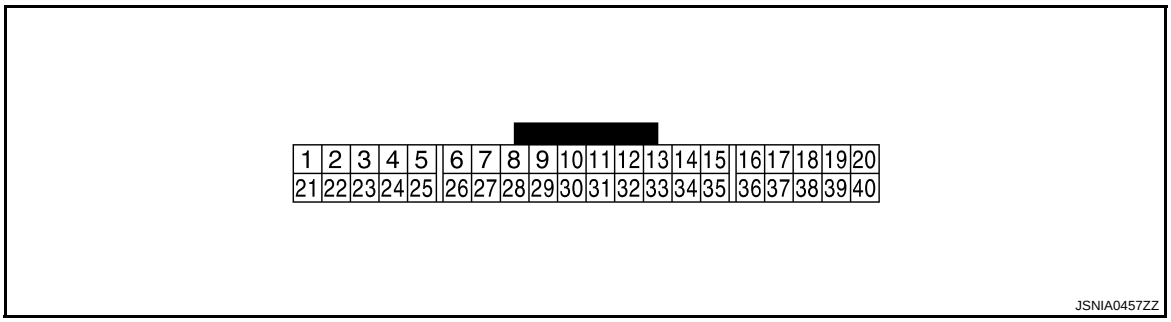
Monitor Item	Condition		Value/Status
OIL W/L	Ignition switch ON	Oil pressure warning lamp ON	On
		Oil pressure warning lamp OFF	Off
LIGHT IND	Ignition switch ON	Tail lamp indicator lamp ON	On
		Tail lamp indicator lamp OFF	Off
DPF W/L	Ignition switch ON	DPF warning lamp ON	On
		DPF warning lamp OFF	Off
AT TEMP W/L	Ignition switch ON	A/T TEMP warning lamp ON	On
		A/T TEMP warning lamp OFF	Off
VDC/TCS IND	Ignition switch ON	ESP OFF indicator lamp ON	On
		ESP OFF indicator lamp OFF	Off
ABS W/L	Ignition switch ON	ABS warning lamp ON	On
		ABS warning lamp OFF	Off
SLIP IND	Ignition switch ON	SLIP Indicator lamp ON	On
		SLIP indicator lamp OFF	Off
BRAKE W/L	Ignition switch ON	Brake warning lamp ON	On
		Brake warning lamp OFF	Off
OIL LEVEL IND	Ignition switch ON	Oil level 1 is detected	LEVEL1
		Oil level 2 is detected	LEVEL2
		Oil level 3 is detected	LEVEL3
		Oil level 4 is detected	LEVEL4
		Oil level 5 is detected	LEVEL5
		OIL LOW is detected	On
		Oil level is not detected	CR NG
KEY G W/L	Ignition switch ON	KEY warning lamp (green) ON	On
		KEY warning lamp (green) OFF	Off
KEY R W/L	Ignition switch ON	KEY warning lamp (red) ON	On
		KEY warning lamp (red) OFF	Off
KEY KNOB W/L	Ignition switch ON	LOCK warning lamp ON	On
		LOCK warning lamp OFF	Off
M RANGE SW	Ignition switch ON	Manual mode	On
		Other than the above	Off
NM RANGE SW	Ignition switch ON	Manual mode	Off
		Other than the above	On
AT SFT UP SW	Ignition switch ON	Selector lever (+) position	On
		Other than the above	Off
AT SFT DWN SW	Ignition switch ON	Selector lever (–) position	On
		Other than the above	Off
P RANGE IND	Ignition switch ON	Selector lever in P position	On
		Other than the above	Off
R RANGE IND	Ignition switch ON	Selector lever in R position	On
		Other than the above	Off
N RANGE IND	Ignition switch ON	Selector lever in N position	On
		Other than the above	Off

Monitor Item	Condition		Value/Status
D RANGE IND	Ignition switch ON	Selector lever in D position	On
		Other than the above	Off
4 RANGE IND	Ignition switch ON	Shift indicator 4 is displayed	On
		Other than the above	Off
3 RANGE IND	Ignition switch ON	Shift indicator 3 is displayed	On
		Other than the above	Off
2 RANGE IND	Ignition switch ON	Shift indicator 2 is displayed	On
		Other than the above	Off
1 RANGE IND	Ignition switch ON	Shift indicator 1 is displayed	On
		Other than the above	Off
AT CHECK-W/L	Ignition switch ON	TCM electronic control system warning lamp ON	On
		TCM electronic control system warning lamp OFF	Off
CVT IND	Ignition switch ON	CVT indicator lamp ON	On
		CVT indicator lamp OFF	Off
CRUISE IND	Ignition switch ON	Cruise indicator lamp ON	On
		Cruise indicator lamp OFF	Off
SET IND	Ignition switch ON	SET indicator lamp ON	On
		SET indicator lamp OFF	Off
4WD LOCK SW	Ignition switch ON	4WD LOCK switch ON	On
		4WD LOCK switch OFF	Off
4WD LOCK IND	Ignition switch ON	4WD LOCK indicator lamp ON	On
		4WD LOCK indicator lamp OFF	Off
4WD W/L	Ignition switch ON	4WD warning lamp ON	On
		4WD warning lamp OFF	Off
EPS W/L	Ignition switch ON	EPS warning lamp ON	On
		EPS warning lamp OFF	Off

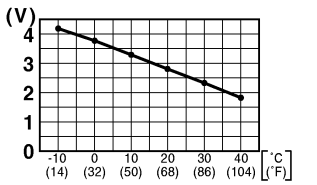
NOTE:

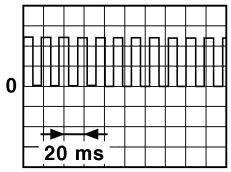
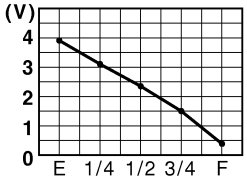
Some items are not available according to vehicle specification.

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
1 (Y)	Ground	Battery power supply	Input	Ignition switch OFF	—	Battery voltage
2 (GR)	Ground	IGN signal	Input	Ignition switch ON	—	Battery voltage
3 (B)	Ground	Ground	—	Ignition switch ON	—	0 V
11 (B)*1 (R)*2	Ground	Steering switch (trip computer) signal	Input	Ignition switch ON	Press the steering switch (trip computer)	0 V
					Other than the above	5 V
15 (W)	Ground	Air bag signal	Input	Ignition switch ON	Air bag warning lamp ON	4 V
					Air bag warning lamp OFF	0 V
19 (V)	Ground	OAT sensor signal	Input	Ignition switch ON	—	 JSNIA0014GB
20 (L/O)	Ground	OAT sensor ground	—	Ignition switch ON	—	0 V
21 (L)	—	CAN-H	—	—	—	—
22 (P)	—	CAN-L	—	—	—	—
23 (B)	Ground	Ground	—	Ignition switch ON	—	0 V
24 (G)	Ground	Fuel level sensor signal ground	—	Ignition switch ON	—	0 V
25 (L)	Ground	Alternator signal	Input	Ignition switch ON	Charge warning lamp ON	0 V
					Charge warning lamp OFF	12 V
26 (V)	Ground	Parking brake switch signal	Input	Ignition switch ON	Parking brake ON	0 V
					Parking brake OFF	5 V
27 (BR)	Ground	Brake fluid level switch signal	Input	Ignition switch ON	Brake fluid level is normal	5 V
					Brake fluid level is less than LOW level	0 V
28 (SB)	Ground	Security signal	Input	Ignition switch ON	Security warning lamp ON	0 V
					Security warning lamp OFF	12 V

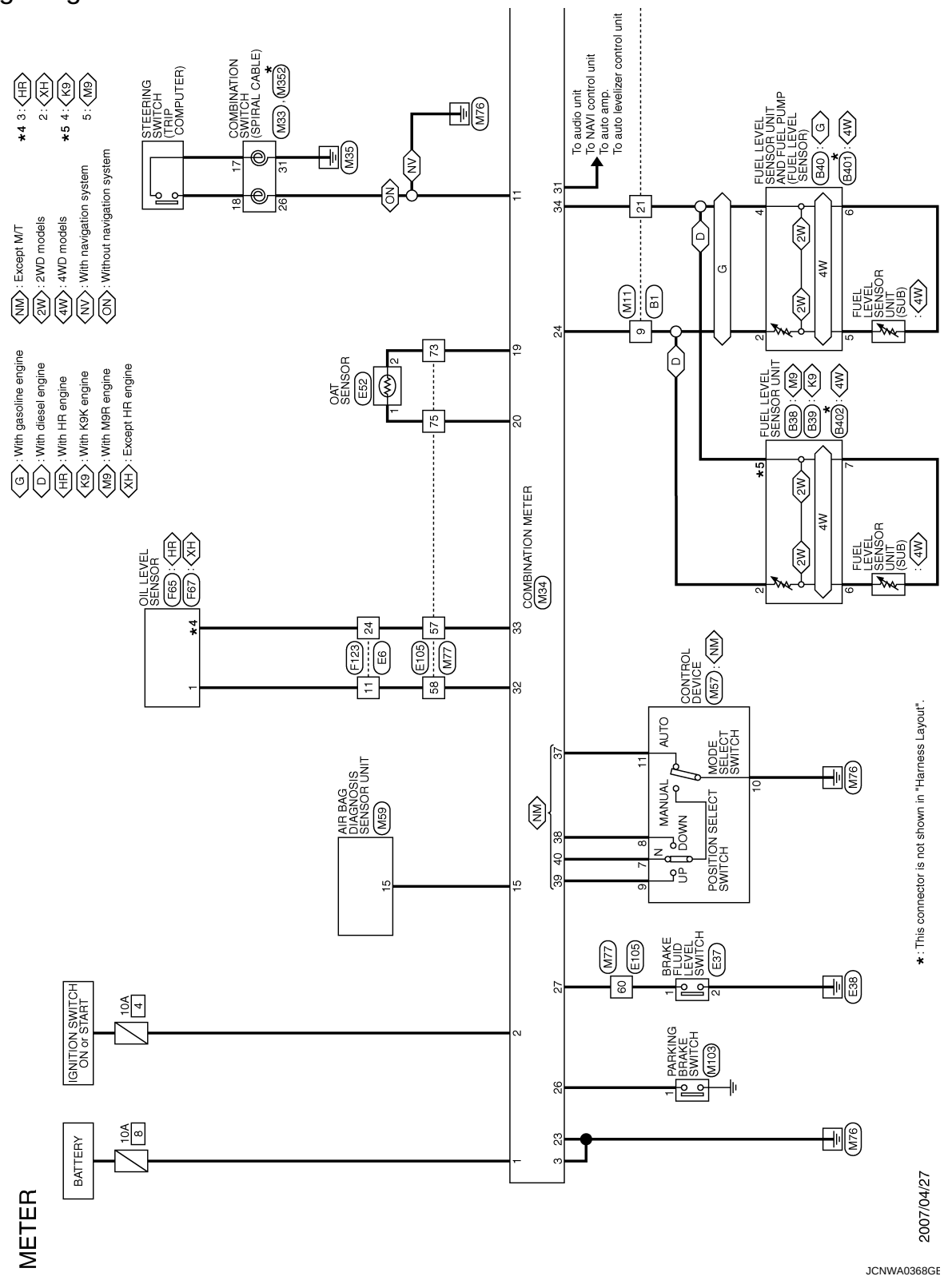
Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
31 (Y)	Ground	Vehicle speed signal (8 pulse)	Output	Ignition switch ON	Vehicle speed is approx. 40 km/h (25 MPH)	**NOTE:** The maximum voltage varies depending on the specification (destination unit).  JSNIA0012GB
32 (Y)	Ground	Oil level sensor signal	Input	Ignition switch ON	—	Refer to MWI-32, "Component Inspection (HR16DE Engine Models)" or MWI-33, "Component Inspection (Except HR16DE Engine Models)". **NOTE:** The measurement cannot be performed because the signal is input for a moment with the ignition switch ON.
33 (P)	Ground	Oil level sensor signal ground	—	Ignition switch ON	—	0 V
34 (B)	Ground	Fuel level sensor signal	Input	Ignition switch ON	—	 JSNIA0322GB
35 (O)	Ground	Seat belt buckle switch signal (driver side)	Input	Ignition switch ON	When driver seat belt is fastened	5 V
					When driver seat belt is unfastened	0 V
36 (GR)	Ground	Seat belt buckle switch signal (passenger side)	Input	Ignition switch ON	• When getting in the passenger seat • When passenger seat belt is fastened	12 V
					• When getting in the passenger seat • When passenger seat belt is not fastened	0 V
37 (R)	Ground	Not manual mode signal	Input	Ignition switch ON	Manual mode	12 V
					Other than the above	0 V
38 (LG)	Ground	Manual mode shift down signal	Input	Ignition switch ON	Selector lever (–) position	0 V
					Other than the above	12 V
39 (W)	Ground	Manual mode shift up signal	Input	Ignition switch ON	Selector lever (+) position	0 V
					Other than the above	12 V

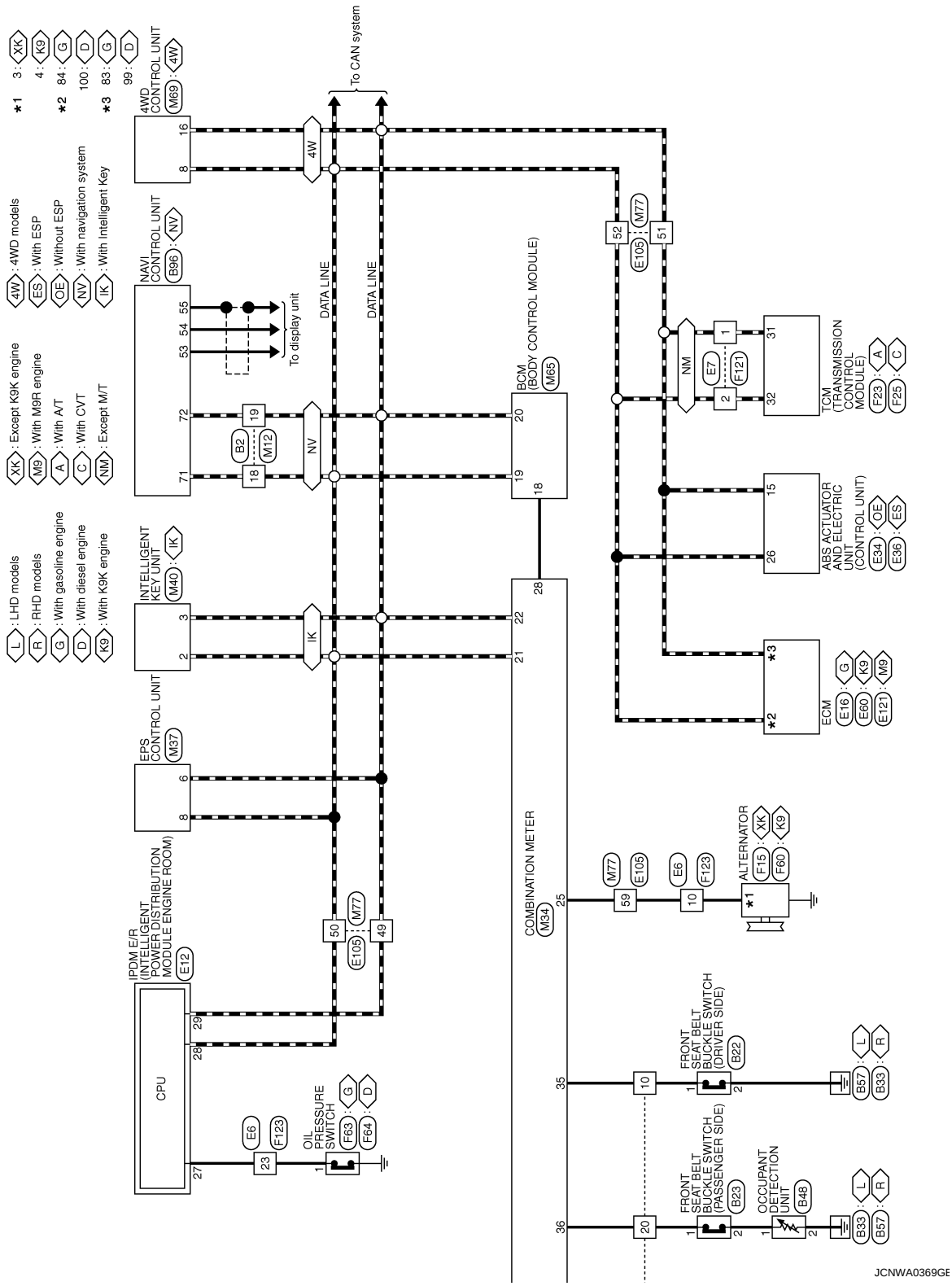
Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
40 (L)	Ground	Manual mode signal	Input	Ignition switch ON	Manual mode	0 V
					Other than the above	12 V

*1: With NAVI
*2: Without NAVI

Wiring Diagram - METER -

INFOID:0000000001193779



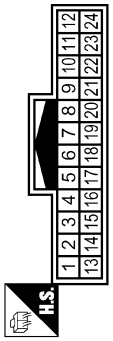

To CAN system
4WD CONTROL UNIT M69 4W
NAVI CONTROL UNIT B96 NV
INTELLIGENT KEY UNIT M40 IK
EPS CONTROL UNIT M37
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E12
CPU
OIL PRESSURE SWITCH F63 F64
To display unit
DATA LINE
DATA LINE
BCM (BODY CONTROL MODULE) M65
COMBINATION METER M34
NM
TCM (TRANSMISSION CONTROL MODULE) F23 A F25 C
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) E34 OE E36 ES
ECM E16 G E60 K9 E121 M9
ALTERNATOR F15 XK F60 K9
FRONT SEAT BELT BUCKLE SWITCH (DRIVER SIDE) B22
FRONT SEAT BELT BUCKLE SWITCH (PASSENGER SIDE) B23
OCCUPANT DETECTION UNIT B48
B57 L B33 R
B33 L B57 R
4W : 4WD models
ES : With ESP
OE : Without ESP
NV : With navigation system
IK : With Intelligent Key
XK : Except K9K engine
M9 : With M9R engine
A : With A/T
C : With CVT
NM : Except M/T
L : LHD models
R : RHD models
G : With gasoline engine
D : With diesel engine
K9 : With K9K engine
*1 3 : XK 4 : K9
*2 84 : G 100 : D
*3 83 : G 99 : D
JCNWA0369GE

METER

Connector No.	B1
Connector Name	WIRE TO WIRE
Connector Type	TH24MW

Terminal No.	Color of Wire	Signal Name [Specification]
9	G	–
10	O	–
20	GR	–
21	B	–

Connector No.	B2
Connector Name	WIRE TO WIRE
Connector Type	TH24MW



Terminal No.	Color of Wire	Signal Name [Specification]
18	L	–
19	P	–

Connector No.	B22
Connector Name	FRONT SEAT BELT BUCKLE SWITCH (DRIVER SIDE)
Connector Type	C02FW

Terminal No.	Color of Wire	Signal Name [Specification]
1	O	–
2	B	–

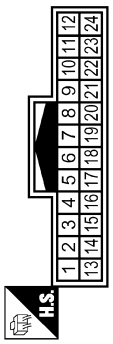
Connector No.	B23
Connector Name	FRONT SEAT BELT BUCKLE SWITCH (PASSENGER SIDE)
Connector Type	C02FW

Terminal No.	Color of Wire	Signal Name [Specification]
1	GR	–
2	LG	–

Connector No.	B38
Connector Name	FUEL LEVEL SENSOR UNIT
Connector Type	E05FGY-RS

Terminal No.	Color of Wire	Signal Name [Specification]
2	G	–
5	B	–

Connector No.	B39
Connector Name	FUEL LEVEL SENSOR UNIT
Connector Type	E04FGY-RS



Terminal No.	Color of Wire	Signal Name [Specification]
2	G	–
4	B	–

Connector No.	B40
Connector Name	FUEL LEVEL SENSOR UNIT AND FUEL PUMP
Connector Type	E04FGY-RS

Terminal No.	Color of Wire	Signal Name [Specification]
2	G	–
4	B	–

Connector No.	B48
Connector Name	OCCUPANT DETECTION UNIT
Connector Type	S02FW

Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	–
2	B	–

JCNWA0370GE

METER

Connector No.	B96
Connector Name	NAVI CONTROL UNIT
Connector Type	TH32FW

Terminal No.	Color of Wire	Signal Name [Specification]
53	W	COMM (CONT−DISP)
54	O	COMM (DISP−CONT)
55	SHIELD	SHIELD
71	L	CAN-H
72	P	CAN-L

Connector No.	E7
Connector Name	WIRE TO WIRE
Connector Type	NS16MW−CS

Terminal No.	Color of Wire	Signal Name [Specification]
1	P	–
2	L	–

Connector No.	B401
Connector Name	FUEL LEVEL SENSOR UNIT AND FUEL PUMP
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
5	–	–
6	–	–

Connector No.	E12
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FW−CS

Terminal No.	Color of Wire	Signal Name [Specification]
27	W	–
28	L	–
29	P	–

Connector No.	B402
Connector Name	FUEL LEVEL SENSOR UNIT
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
6	–	–
7	–	–

Connector No.	E16
Connector Name	ECM
Connector Type	MA24FB−MEA8−LH

Terminal No.	Color of Wire	Signal Name [Specification]
83	P	CAN-LI
84	L	CAN-HI

Connector No.	E6
Connector Name	WIRE TO WIRE
Connector Type	TK24MW−I-V

Terminal No.	Color of Wire	Signal Name [Specification]
10	L	–
11	Y	–
23	W	–
24	P	–

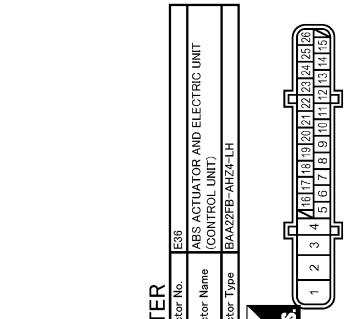
Connector No.	E34
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Type	BAA22FB−AHZ4−LH

Terminal No.	Color of Wire	Signal Name [Specification]
15	P	CAN-L
26	L	CAN-H

JCNWA0371GE

METER

Connector No.	E36
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Type	BAA22FB-AH24-LH



Terminal No.	Color of Wire	Signal Name [Specification]
15	P	CAN-L
26	L	CAN-H

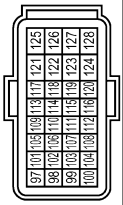
Connector No.	E37
Connector Name	BRAKE FLUID LEVEL SWITCH
Connector Type	YV02FGY

Terminal No.	Color of Wire	Signal Name [Specification]
1	R/B	–
2	B	–

Connector No.	E52
Connector Name	OAT SENSOR
Connector Type	RH04FB

Terminal No.	Color of Wire	Signal Name [Specification]
1	L/O	–
2	V	–

Connector No.	E60
Connector Name	ECM
Connector Type	MAA24FB-MEA8-LH



Terminal No.	Color of Wire	Signal Name [Specification]
99	P	MAIN CAN-L (BODY)
100	L	MAIN CAN-H (BODY)

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH60MW-NS16-TM4

Terminal No.	Color of Wire	Signal Name [Specification]
49	P	–
50	L	–
51	P	–
52	L	–
57	P	–
58	Y	–
59	L	–
60	R/B	–
73	V	–
75	L/O	–

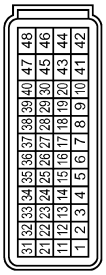
Connector No.	E121
Connector Name	ECM
Connector Type	MAA24FB-MEA8-LH

Terminal No.	Color of Wire	Signal Name [Specification]
99	P	MAIN CAN-L(BODY)
100	L	MAIN CAN-H(BODY)

Connector No.	F15
Connector Name	ALTERNATOR
Connector Type	HS03FB

Terminal No.	Color of Wire	Signal Name [Specification]
3	L	L

Connector No.	F23
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Type	MOLEX 500994-4111



Terminal No.	Color of Wire	Signal Name [Specification]
31	P	CAN-L
32	L	CAN-H

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METER

Connector No.	F25
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Type	MOLEX 500894-4111

Terminal No.	Color of Wire	Signal Name [Specification]
31	P	CAN-L
32	L	CAN-H

Connector No.	F65
Connector Name	OIL LEVEL SENSOR
Connector Type	RS03FSB

Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	+
3	P	–

Connector No.	F60
Connector Name	ALTERNATOR
Connector Type	FEA02FB

Terminal No.	Color of Wire	Signal Name [Specification]
4	L	L

Connector No.	F67
Connector Name	OIL LEVEL SENSOR
Connector Type	BS02FB-AHY-S

Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	+
2	P	–

Connector No.	F63
Connector Name	OIL PRESSURE SWITCH
Connector Type	E01FGY-RS-AR

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	–

Connector No.	F64
Connector Name	OIL PRESSURE SWITCH
Connector Type	RH02FB

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	–

Connector No.	F121
Connector Name	WIRE TO WIRE
Connector Type	NS16FW-CS

Terminal No.	Color of Wire	Signal Name [Specification]
1	P	–
2	L	–

Connector No.	F123
Connector Name	WIRE TO WIRE
Connector Type	TK24FW-1V

Terminal No.	Color of Wire	Signal Name [Specification]
10	L	–
11	Y	–
23	W	–
24	P	–

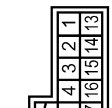
JCNWA0373GE

METER

Connector No.	M11
Connector Name	WIRE TO WIRE
Connector Type	TH24FW

Terminal No.	Color of Wire	Signal Name [Specification]
9	G	–
10	O	–
20	GR	–
21	B	–

Connector No.	M12
Connector Name	WIRE TO WIRE
Connector Type	TH24FW



Terminal No.	Color of Wire	Signal Name [Specification]
18	L	–
19	P	–

Connector No.	M33
Connector Name	COMBINATION SWITCH (SPIRAL CABLE)
Connector Type	TK08FGY-1V

Terminal No.	Color of Wire	Signal Name [Specification]
26	R	–
31	B	–

Connector No.	M34
Connector Name	COMBINATION METER
Connector Type	SAB40FW

Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	BAT
2	GR	IGN
3	B	GND
11	R	STEERING SW[Without navigation system]
15	W	AIR BAG
19	V	OAT SENS
20	L/O	OAT SENS GND
21	L	CAN-H
22	P	CAN-L
23	B	GND
24	G	FUEL LEVEL SENS GND

25	L	ALTERNATOR
26	V	PARKING BRAKE SW
27	BR	BRAKE FLUID LEVEL SW
28	SB	SECURITY
31	Y	VEHICLE SPEED (8-PULSE)
32	Y	OIL LEVEL SENS
33	P	OIL LEVEL SENS GND
34	B	FUEL LEVEL SENS
35	O	SEAT BELT BUCKLE SW (DRIVER SIDE)
36	GR	SEAT BELT BUCKLE SW (PASSENGER SIDE)
37	R	NOT MANUAL MODE
38	LG	SHIFT DOWN
39	W	SHIFT UP
40	L	MANUAL MODE

Connector No.	M37
Connector Name	EPS CONTROL UNIT
Connector Type	Molex 88545-0001

Terminal No.	Color of Wire	Signal Name [Specification]
6	P	CAN-L
8	L	CAN-H

Connector No.	M40
Connector Name	INTELLIGENT KEY UNIT
Connector Type	TH40FW

Terminal No.	Color of Wire	Signal Name [Specification]
2	L	CAN-H
3	P	CAN-L

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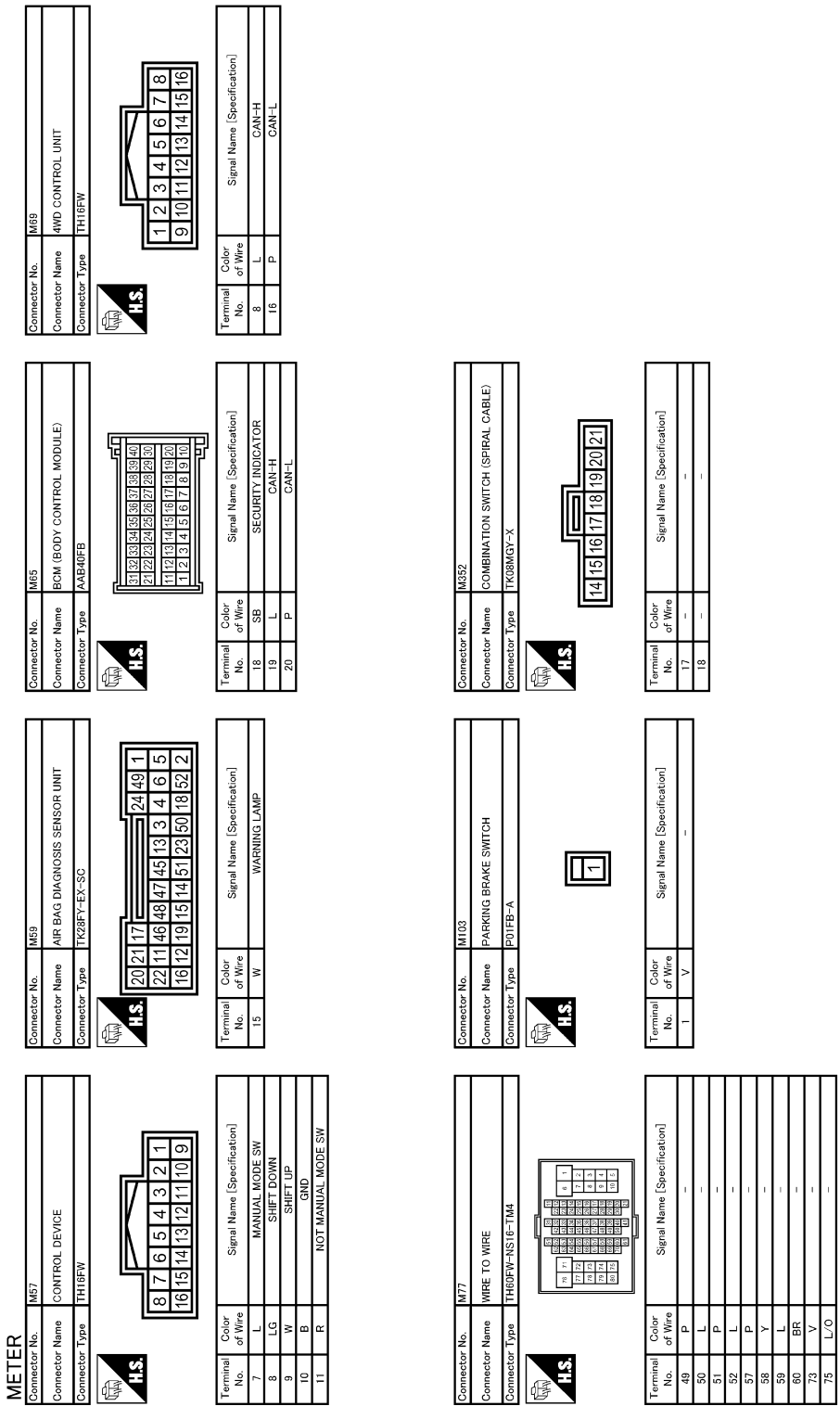


JCNWA0375GE

Fail Safe

INFOID:0000000001193780

The combination meter activates the fail-safe control if the CAN communication lines between each unit are malfunctioning.

Function		Specifications
Speedometer		Reset to zero by suspending communication.
Tachometer		
Meter illumination control		Changed to nighttime mode.
Buzzer		Turned off by suspending communication.
Warning lamp/indicator lamp	ABS warning lamp	Turned on by suspending communication.
	Brake warning lamp	
	EPS OFF indicator lamp	
	VDC OFF indicator lamp	
	SLIP indicator lamp	
	CVT indicator lamp	Turned off by suspending communication.
	AT CHECK warning lamp	
	Oil pressure warning lamp	
	Door warning lamp	
	Malfunction indicator lamp	
	CRUISE indicator lamp	
	Tail lamp indicator lamp	
	Front fog indicator lamp	
	Rear fog indicator lamp	
	Glow indicator lamp	
	DPF warning lamp	
	Malfunction indicator lamp 2	
	Trailer indicator lamp	
	KEY R/G warning lamp	
	KEY LOCK warning lamp	
	High beam indicator lamp	
	Turn signal indicator lamp	

DTC Index

INFOID:0000000001193781

Display contents of CONSULT-III	Time	Diagnostic item is detected when ...	Refer to
CAN COMM CIRCUIT [U1000]	CRNT, 1 - 39	Combination meter is not transmitting or receiving CAN communication signal for 2 seconds or more.	MWI-30
VEHICLE SPEED [B2205]	CRNT, 1 - 39	The abnormal vehicle speed signal is input from ABS actuator and electric unit (control unit) for 2 seconds or more.	MWI-31
OIL LEV SEN OPEN [B2321]	CRNT, 1 - 39	Combination meter judged that the oil level sensor signal circuit is open-circuited for 1 second or more.	MWI-32 (HR16DE) MWI-32 (Except HR16DE)
OIL LEV SEN SHORT [B2322]	CRNT, 1 - 39	Combination meter judged that the oil level sensor signal circuit is short-circuited for 1 second or more.	

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

Reference Value

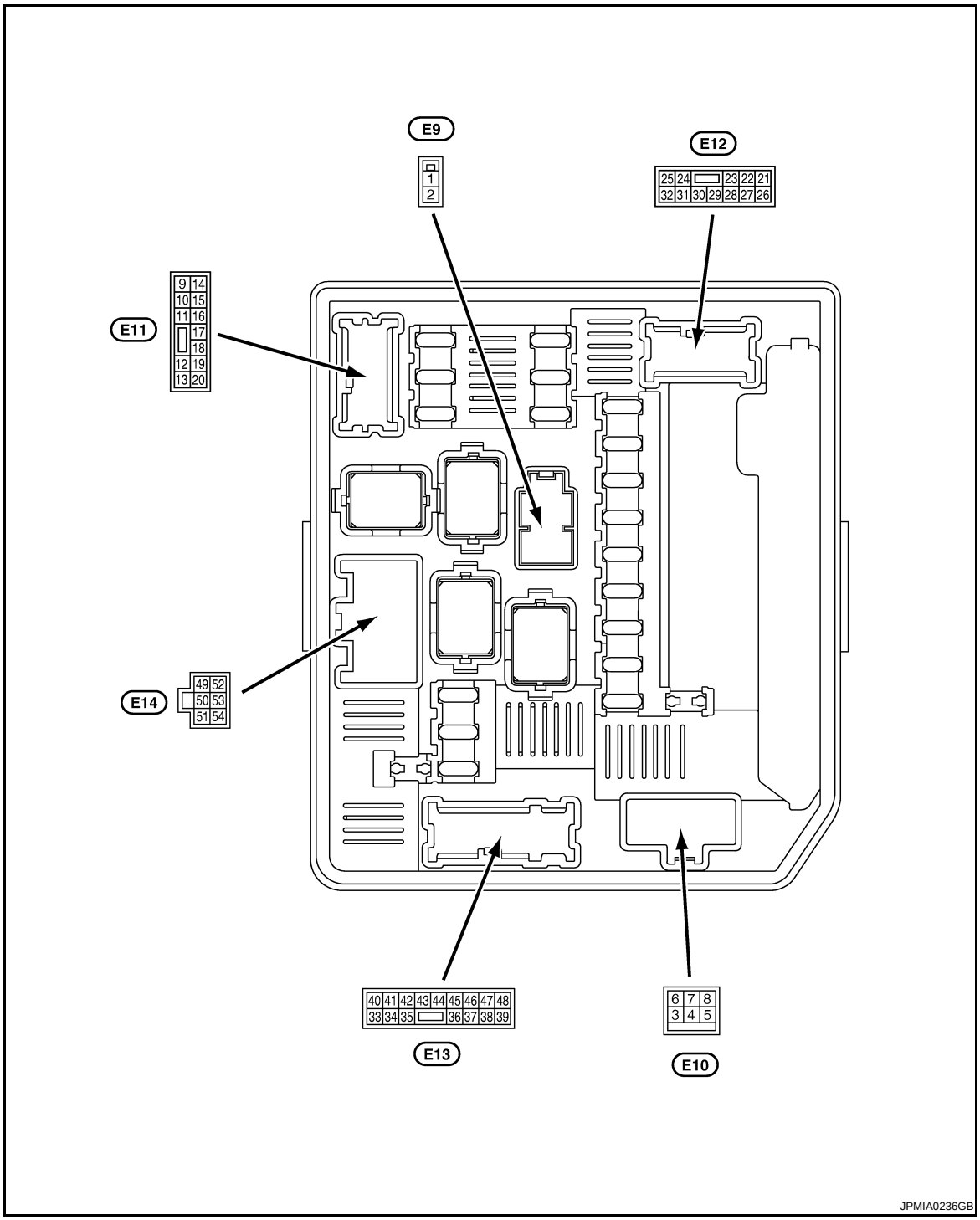
INFOID:0000000001193782

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 - 3
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	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 due to fail-safe operation (cut-out 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

Monitor Item	Condition	Value/Status
REV SW	Except selector lever R position	Off
	Selector lever R position	On
HOOD SW **NOTE:** This item is monitored only on the vehicle with the Vehicle Security (Theft Warning) 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 (Theft Warning) system.	Not operation	Off
	Horn is activated with Vehicle Security (Theft Warning) system.	On
HORN CHIRP	**NOTE:** This item is indicated, but not monitored.	Off
IGN ON SW	Ignition switch OFF or ACC	Off
	Ignition switch ON	On

TERMINAL LAYOUT



PHYSICAL VALUES

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
5 (B)	Ground	Ground	—	Ignition switch ON	0 V

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
6 (B)	Ground	Ground	—	Ignition switch ON		0 V
7 (Y)	Ground	Front wiper LO	Output	Ignition switch ON	Front wiper switch OFF	0 V
					Front wiper switch LO	Battery voltage
8 (Y/R)	Ground	Front wiper HI	Output	Ignition switch ON	Front wiper switch OFF	0 V
					Front wiper switch HI	Battery voltage
9 (G)	Ground	ECM relay power supply	Output	Ignition switch ON		Battery voltage
10*1 (L/R)	Ground	ECM relay power supply	Output	Ignition switch ON		Battery voltage
11*2 (O)	Ground	PTC heater 1 relay control	Output	PTC heater OFF		Battery voltage
				PTC heater ON		0 V
12*2 (G/Y)	Ground	PTC heater 2 relay control	Output	PTC heater OFF		Battery voltage
				PTC heater ON		0 V
14 (R/B)	Ground	Ignition power supply	Output	Ignition switch OFF or ACC		0 V
				Ignition switch ON		Battery voltage
15 (Y/L)*1 (B/R)*2	Ground	ECM relay control	Input	• Engine running • Ignition switch OFF (For a few seconds after turning ignition switch OFF)		0 - 1.0 V*1
						0.6 V*2
				Ignition switch OFF or ACC (More than a few seconds after turning ignition switch OFF)		Battery voltage
16*3 (Y/R)	Ground	Ignition relay power supply	Output	Ignition switch ON		Battery voltage
				Ignition switch OFF or ACC		0 V
19*1 (R/O)	Ground	Ignition relay power supply	Output	Ignition switch ON		Battery voltage
				Ignition switch OFF or ACC		0 V
21*4 (GR)	Ground	Hood switch	Input	Close the hood		0 V → Battery voltage → 0 V
				Open the hood		0 V
22 (Y/G)	Ground	Reverse switch	Input	Ignition switch OFF or ACC		0 V
				Ignition switch ON	• Selector lever “R” (Except M/T models) • M/T control lever “R” (M/T models)	Battery voltage
					• Selector lever in any position other than “R” (Except M/T models) • M/T control lever in any position other than “R” (M/T models)	0 V
23 (Y/B)	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
24 (R/Y)	Ground	Headlamp LO (RH)	Output	Lighting switch OFF		0 V
				Lighting switch 2ND		Battery voltage

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
25*1 (G/L)	Ground	ETC relay control	Input	Ignition switch OFF or ACC		Battery voltage
				Ignition switch ON		0 - 1.0 V
26 (O)	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
27 (W)	Ground	Oil pressure switch	Input	Engine stopped		0 V
				Engine running		Battery voltage
28 (L)	—	CAN-H	Input/ Output	—		—
29 (P)	—	CAN-L	Input/ Output	—		—
30*4 (L)	Ground	Horn relay control	Output	The horn is not activated		Battery voltage
				The horn is activated		0 V
31 (R)	Ground	Headlamp LO (sensor)	Output	Lighting switch OFF		0 V
				Lighting switch 2ND		Battery voltage
32*1 (R/Y)	Ground	ETC relay power supply	Output	Ignition switch ON		Battery voltage
33*1 (B/O)	Ground	Fuel pump relay control	Input	• Engine running • Ignition switch ON (For 1 second after turning ignition switch ON)		0 - 1.0 V
				Ignition switch ON (More than 1 second after turning ignition switch ON)		Battery voltage
34 (R/B)	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
35 (W/L)	Ground	Ignition switch ON	Input	Ignition switch OFF or ACC		0 V
				Ignition switch ON		Battery voltage
36 (W)	Ground	Front fog lamp (RH)	Output	Lighting switch 1ST	Front fog lamp switch ON	Battery voltage
					Front fog lamp switch OFF	0 V
37 (R/W)	Ground	Parking lamp (RH)	Output	Lighting switch 1ST		Battery voltage
				Lighting switch OFF		0 V
38 (R/L)	Ground	Tail, license plate lamps and illuminations	Output	Lighting switch 1ST		Battery voltage
				Lighting switch OFF		0 V
39 (GR)	Ground	Headlamp washer relay control	Output	Ignition switch ON	When headlamp washer is operating	0 V
					When headlamp washer is not operating	Battery voltage
40*1 (BR/Y)*5 (SB)*6	Ground	Ignition relay power supply	Output	Ignition switch OFF or ACC		0 V
				Ignition switch ON		Battery voltage
41 (P)	Ground	Ignition relay power supply	Output	Ignition switch OFF or ACC		0 V
				Ignition switch ON		Battery voltage

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
42*1 (B/Y)	Ground	Fuel pump relay power supply	Output	• Ignition switch OFF or ACC • Approximately 1 second or more after turning the ignition switch ON		0 V
				• Approximately 1 second after turning the ignition switch ON • Engine running		Battery voltage
43 (W/B)	Ground	Front fog lamp (LH)	Output	Lighting switch 1ST	Front fog lamp switch ON	Battery voltage
					Front fog lamp switch OFF	0 V
44 (L)	Ground	Headlamp LO (LH)	Output	Lighting switch OFF		0 V
				Lighting switch 2ND		Battery voltage
45 (L/W)	Ground	Headlamp HI (RH)	Output	• Lighting switch 2ND and HI • lighting switch PASS		Battery voltage
				Lighting switch OFF		0 V
46 (G)	Ground	Headlamp HI (LH)	Output	• Lighting switch 2ND and HI • Lighting switch PASS		Battery voltage
				Lighting switch OFF		0 V
47 (R/L)	Ground	Parking lamp (LH)	Output	Lighting switch 1ST		Battery voltage
				Lighting switch OFF		0 V
48*7 (Y)	Ground	Cooling fan relay-3 control	Output	When cooling fan does HI operation		0 V
				When cooling fan does OFF or LO operation		Battery voltage
49 (B)	Ground	Rear window defogger relay power supply	Output	Ignition switch ON	Rear window defogger switch ON	Battery voltage
					Rear window defogger switch OFF	0 V
50 (B/R)	Ground	Starter relay power supply	Output	When engine is cranking		Battery voltage
				When engine is not cranking		0 V
51 (P)	Ground	Ignition switch START	Input	Ignition switch START		Battery voltage
				Ignition switch OFF, ACC or ON		0 V
52 (W)	Ground	Cooling fan relay-1 power supply	Output	When cooling fan does LO or HI operation		Battery voltage
				When cooling fan does OFF operation		0 V
53 (W/B)	Ground	Battery power supply (Cooling fan relay)	Input	Ignition switch OFF		Battery voltage
54*5 (R)	Ground	Cooling fan relay-2 power supply	Input	When cooling fan does HI operation		Battery voltage
				When cooling fan does OFF or LO operation		0 V

*1: HR engine and MR engine models

*2: K9K engine and M9R engine models

*3: Except M/T models only

*4: With vehicle security (theft warning) system

*5: HR engine models

*6: MR engine models

*7: MR engine, K9K engine and M9R engine models

Wiring Diagram - IPDM E/R -

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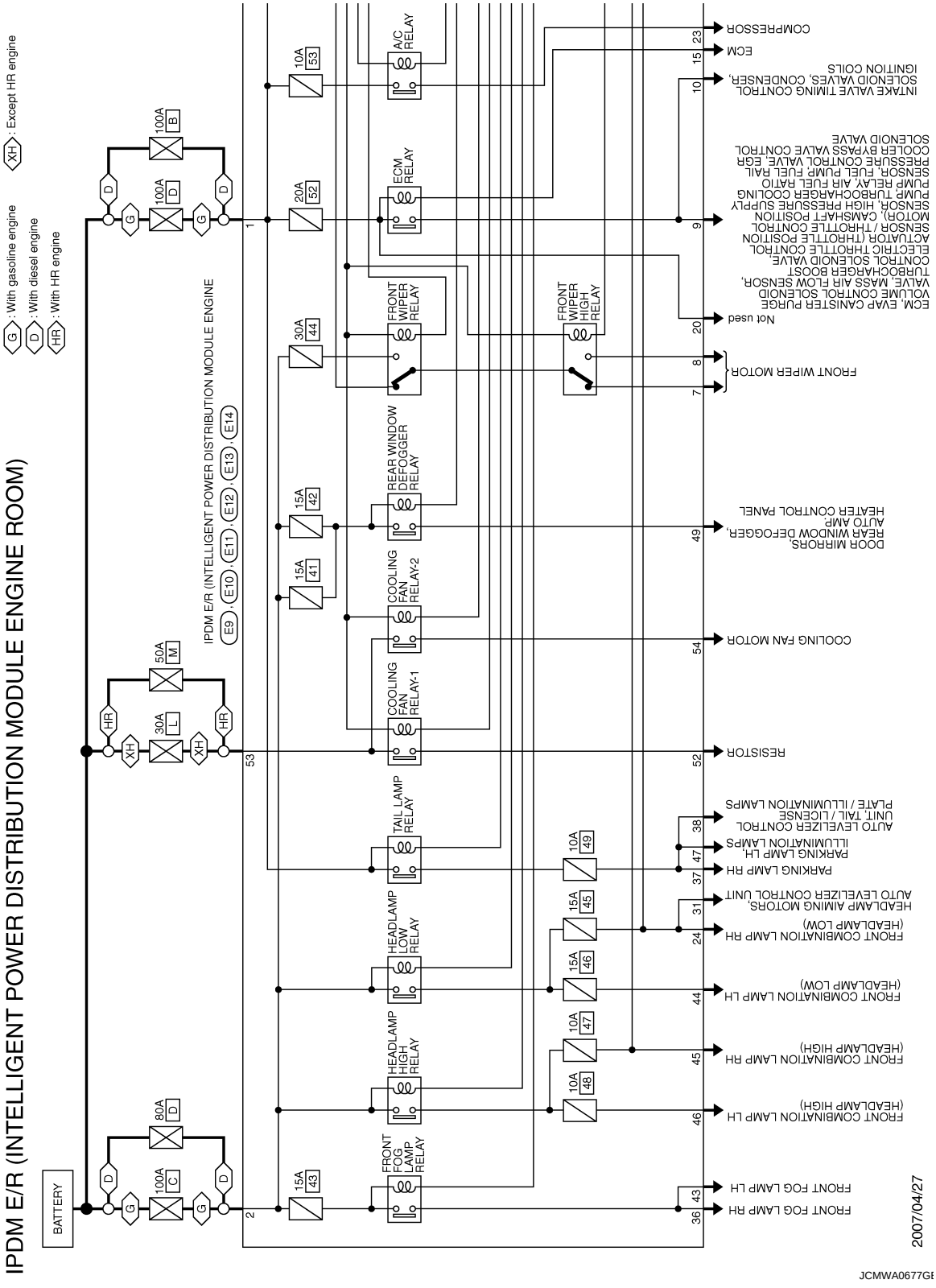

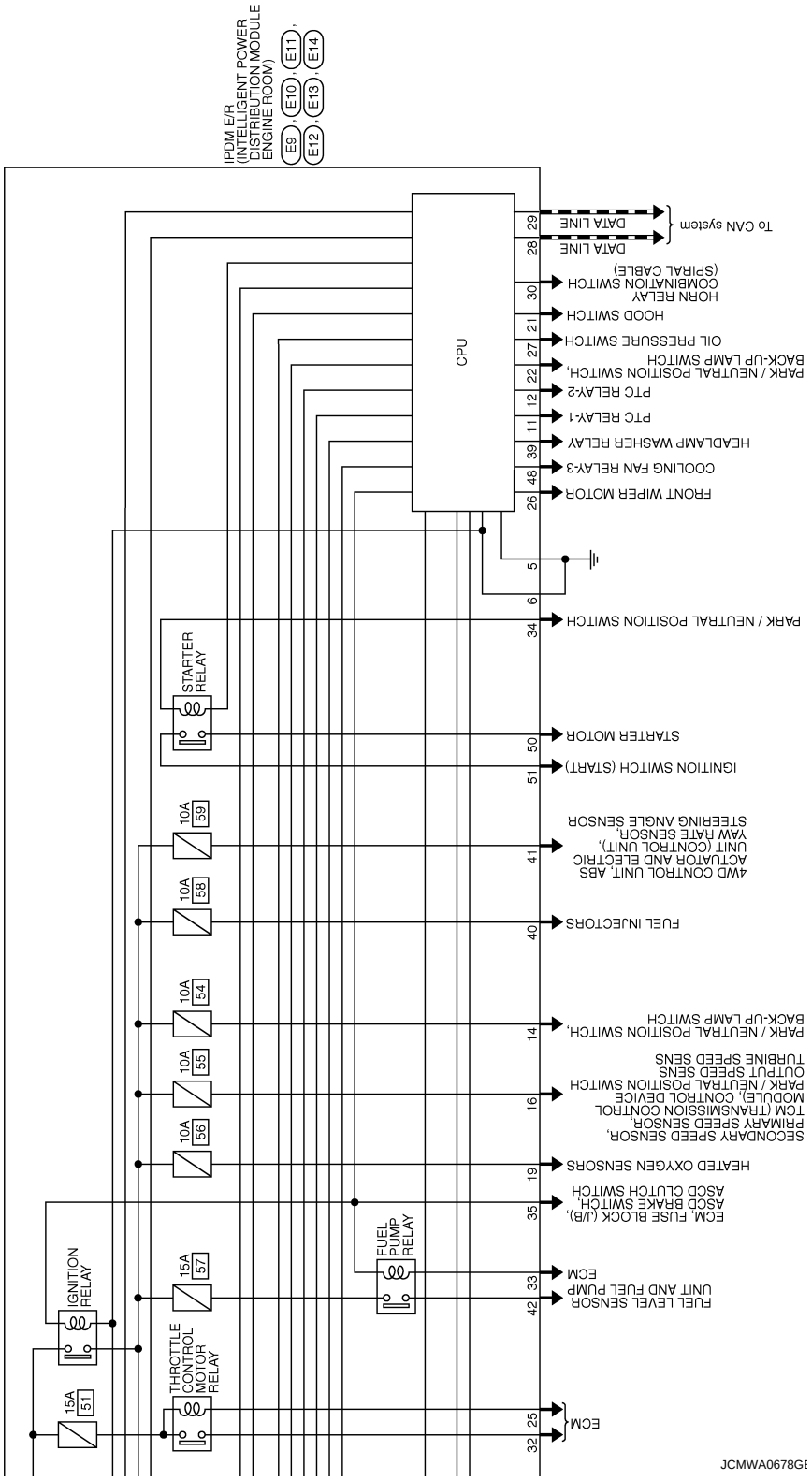
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E9, E10, E11, E12, E13, E14
CPU
To CAN system
DATA LINE
DATA LINE
HORN RELAY CONTROL SIGNAL (SPIRAL CABLE)
HOOD SWITCH
OIL PRESSURE SWITCH
PARK / NEUTRAL POSITION SWITCH, BACK-UP LAMP SWITCH
PTC RELAY-2
PTC RELAY-1
HEADLAMP WASHER RELAY
COOLING FAN RELAY-3
FRONT WIPER MOTOR
PARK / NEUTRAL POSITION SWITCH
STARTER MOTOR
IGNITION SWITCH (START)
4WD CONTROL UNIT, ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT), YAW RATE SENSOR, STEERING ANGLE SENSOR
FUEL INJECTORS
PARK / NEUTRAL POSITION SWITCH, BACK-UP LAMP SWITCH
SECONDARY SPEED SENSOR, PRIMARY SPEED SENSOR, TCM (TRANSMISSION CONTROL MODULE), CONTROL DEVICE OUTPUT SPEED SENS PARK / NEUTRAL POSITION SWITCH TURBINE SPEED SENS
HEATED OXYGEN SENSORS
ECM, FUSE BLOCK (J/B), ASCD BRAKE SWITCH, ASCD CLUTCH SWITCH
FUEL LEVEL SENSOR UNIT AND FUEL PUMP
ECM
ECM
STARTER RELAY
IGNITION RELAY
THROTTLE CONTROL MOTOR RELAY
FUEL PUMP RELAY
10A 59
10A 58
10A 54
10A 55
10A 56
15A 57
15A 51
JCMWA0678GB

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

Connector No.	E9
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	L02FB-MC

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	R	–

Connector No.	E10
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	M06FB-LC

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
5	B	–
6	B	–
7	Y	–
8	Y/R	–

Connector No.	E11
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FBR-CS

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
9	G	–
10	L/R	–
11	O	–
12	G/Y	–
14	R/B	–
15	Y/L	–[With gasoline engine]
15	B/R	–[With diesel engine]
16	Y/R	–
19	R/O	–
20	–	–

Connector No.	E12
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FW-CS

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
21	GR	–
22	Y/G	–
23	Y/B	–
24	R/Y	–
25	G/L	–
26	O	–
27	W	–
28	L	–
29	P	–
30	L	–
31	R	–

32	R/Y	–

Connector No.	E13
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS16FW-CS

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
33	B/O	–
34	W/B	–[With A/T]
34	R/B	–[Except A/T]
35	W/L	–
36	W	–
37	R/W	–
38	R/L	–
39	GR	–
40	SB	–[With MR engine]
40	BR/Y	–[With HR engine]
41	P	–
42	B/Y	–
43	W/B	–
44	L	–
45	L/W	–
46	G	–
47	R/L	–
48	Y	–[Except M9R engine]
48	W	–[With M9R engine]

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

Connector No.	E14
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	Y2K 7283-5591-40-F

Terminal No.	Color of Wire	Signal Name [Specification]
49	B	– [Except M9R engine]
49	G	– [With M9R engine]
50	B/R	–
51	P	–
52	W	–
53	W/B	–
54	R	–

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Fail Safe

INFOID:0000000001193784

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	• The cooling fan relay-2*1 or the cooling fan relay-3*2 turns ON when the ignition switch is turned ON • Turns off the fan motor low relay when the ignition switch is turned OFF
A/C compressor	A/C relay OFF

*1: HR engine models

*2: MR engine, K9K engine and M9R engine models

If no CAN communication is available with BCM

Control part	Fail-safe in operation
Headlamp	• 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
• Parking lamps • License plate lamps • Tail lamps • Illuminations	• The tail lamp relay turns ON when the ignition switch is turned ON • The tail lamp relay turns OFF when the ignition switch is turned OFF
Front wiper	• 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	Headlamp washer relay OFF
PTC heater	PTC heater relay OFF

Ignition relay malfunction detection function

- The CPU integrated IPDM E/R monitors the voltage at the contact circuit of the ignition relay inside it.
- IPDM E/R judges the ignition relay error if the ignition relay condition is different from the ignition switch ON signal.
- 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.

DTC	Ignition switch	Ignition relay	Tail lamp relay
—	ON	ON	—
—	OFF	OFF	—
—	OFF	ON	ON (10 minutes)
B2099: IGN RLY OFF	ON	OFF	—

NOTE:

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

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 until ignition switch is turned OFF.

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:0000000001193785

CONSULT display	Fail-safe	Timing[NOTE]		Reference page
No DTC is detected. further testing may be required.	—	—	—	—
U1000: CAN COMM CIRCUIT	×	CRNT	PAST	PCS-14
B2099: IGN RELAY OFF	—	CRNT	PAST	PCS-15
B209A: RAM ERROR	—	CRNT	PAST	PCS-16
B209B: ROM ERROR	—	CRNT	PAST	PCS-17
B2100: EEPROM	—	CRNT	PAST	PCS-18

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.

SYMPTOM DIAGNOSIS

THE FUEL GAUGE DOES NOT MOVE

2WD

2WD : Description

INFOID:0000000001193786

Fuel gauge segment does not move from a certain position.

2WD : Diagnosis Procedure

INFOID:0000000001193787

1. CHECK COMBINATION METER INPUT SIGNAL

Connect CONSULT-III and check the combination meter input signal. Refer to MWI-36, "2WD : Component Function Check".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace combination meter.

2. CHECK FUEL LEVEL SENSOR SIGNAL CIRCUIT

Check the fuel level sensor signal circuit. Refer to MWI-36, "2WD : Diagnosis Procedure".

Is the inspection result normal?

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

3. CHECK FUEL LEVEL SENSOR UNIT (MAIN)

Perform a unit check for the fuel level sensor unit (main). Refer to MWI-37, "2WD : Component Inspection [Fuel Level Sensor Unit (Main)]".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace fuel level sensor unit (main). Refer to FL-6, "2WD : Removal and Installation" (HR16DE/MR20DE), FL-23, "Removal and Installation" (K9K) or FL-35, "2WD : Removal and Installation" (M9R).

4. CHECK FLOAT INTERFERENCE

Check that the float arm interferes with or binds to other components in the fuel tank.

Is the inspection result normal?

YES >> Replace combination meter.
NO >> Repair or replace malfunctioning parts.

4WD

4WD : Description

INFOID:0000000001193788

Fuel gauge segment does not move from a certain position.

4WD : Diagnosis Procedure

INFOID:0000000001193789

1. CHECK COMBINATION METER INPUT SIGNAL

Connect CONSULT-III and check the combination meter input signal. Refer to MWI-38, "4WD : Component Function Check".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace combination meter.

2. CHECK FUEL LEVEL SENSOR SIGNAL CIRCUIT

Check the fuel level sensor signal circuit. Refer to MWI-38, "4WD : Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3. CHECK FUEL LEVEL SENSOR UNIT (MAIN)

Perform a unit check for the fuel level sensor unit (main). Refer to MWI-39, "4WD : Component Inspection [Fuel Level Sensor Unit (Main)]".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace fuel level sensor unit (main). Refer to FL-10, "4WD : Removal and Installation" (MR20DE) or FL-38, "4WD : Removal and Installation" (M9R).

4. CHECK FUEL LEVEL SENSOR UNIT (SUB)

Perform a unit check for the fuel level sensor unit (sub). Refer to MWI-39, "4WD : Component Inspection [Fuel Level Sensor Unit (Sub)]".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace fuel level sensor unit (sub). Refer to FL-10, "4WD : Removal and Installation" (MR20DE) or FL-38, "4WD : Removal and Installation" (M9R).

5. CHECK FLOAT INTERFERENCE

Check that the float arm interferes with or binds to other components in the fuel tank.

Is the inspection result normal?

YES >> Replace combination meter.
NO >> Repair or replace malfunctioning parts.

THE OIL PRESSURE WARNING LAMP DOES NOT TURN ON

Description

INFOID:0000000001193790

The oil pressure warning lamp stays off when the ignition switch is turned ON.

Diagnosis Procedure

INFOID:0000000001193791

1.CHECK OIL PRESSURE WARNING LAMP

Perform auto active test. Refer to PCS-9, "Diagnosis Description".

Is oil pressure warning lamp illuminated?

YES >> GO TO 2.
NO >> Replace combination meter.

2.CHECK OIL PRESSURE SWITCH SIGNAL CIRCUIT

Check the oil pressure switch signal circuit. Refer to MWI-41, "Diagnosis Procedure".

Is the inspection result normal?

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

3.CHECK OIL PRESSURE SWITCH UNIT

Perform a unit check for the oil pressure switch. Refer to MWI-41, "Component Inspection".

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-33, "Removal and Installation".
NO >> Replace oil pressure switch.

THE OIL PRESSURE WARNING LAMP DOES NOT TURN OFF

Description

INFOID:0000000001193792

The oil pressure warning lamp remains illuminated while the engine is running (normal oil pressure).

Diagnosis Procedure

INFOID:0000000001193793

1.CHECK OIL PRESSURE WARNING LAMP

Perform auto active test. Refer to PCS-9, "Diagnosis Description".

Is oil pressure warning lamp illuminated?

YES >> GO TO 2.
NO >> Replace combination meter.

2.CHECK IPDM E/R OUTPUT VOLTAGE

1. Turn ignition switch OFF.
2. Disconnect the oil pressure switch connector.
3. Turn ignition switch ON.
4. Check voltage between the oil pressure switch harness connector terminal 1 and ground.

1 – Ground	: Approx. 12 V

Is the inspection result normal?

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

3.CHECK OIL PRESSURE SWITCH UNIT

Perform a unit check for the oil pressure switch. Refer to MWI-41, "Component Inspection".

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-33, "Removal and Installation".
NO >> Replace oil pressure switch.

4.CHECK OIL PRESSURE SWITCH SIGNAL CIRCUIT

Check the oil pressure switch signal circuit. Refer to MWI-41, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-33, "Removal and Installation".
NO >> Repair harness or connector.

THE AMBIENT TEMPERATURE DISPLAY IS INCORRECT

Description

INFOID:0000000001193794

- The ambient air temperature display flashes and the ambient air temperature is not displayed.
- The displayed ambient air temperature is higher than the actual temperature.
- The displayed ambient air temperature is lower than the actual temperature.

Diagnosis Procedure

INFOID:0000000001193795

NOTE:
Check that the symptom is not applicable to the normal operating condition before starting diagnosis. Refer to MWI-76, "INFORMATION DISPLAY : Description".

1.CHECK OAT SENSOR SIGNAL CIRCUIT

Check the OAT sensor signal circuit. Refer to MWI-42, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector.

2.CHECK OAT SENSOR UNIT

Perform a unit check for the OAT sensor. Refer to MWI-42, "Component Inspection".

Is the inspection result normal?

YES >> Replace combination meter.
NO >> Replace OAT sensor. Refer to VTL-23, "Removal and Installation".

THE OIL LEVEL DISPLAY IS INCORRECT

Description

INFOID:0000000001193796

"Oil Lo" is displayed on the information display (engine oil amount is normal).

Diagnosis Procedure

INFOID:0000000001193797

NOTE:
Check that the symptom is not applicable to the normal operating condition before starting diagnosis. Refer to MWI-76, "INFORMATION DISPLAY : Description".

1. PERFORM SELF-DIAGNOSIS OF CONSULT-III

1. Connect CONSULT-III and perform “Self Diagnostic Result” of combination meter.
2. Check if “DTC B2321 OIL LEV SEN OPEN” or “B2322 OIL LEV SEN SHORT” is detected.

Is any DTC detected?

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

2. CHECK OIL LEVEL SENSOR SIGNAL CIRCUIT

Check the oil level sensor signal circuit. Refer to MWI-32, "Diagnosis Procedure (HR16DE Engine Models)" or MWI-32, "Diagnosis Procedure (Except HR16DE Engine Models)".

Is the inspection result normal?

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

3. CHECK OIL LEVEL SENSOR UNIT

Perform a unit check for the oil level sensor. Refer to MWI-32, "Component Inspection (HR16DE Engine Models)" or MWI-33, "Component Inspection (Except HR16DE Engine Models)".

Is the inspection result normal?

YES >> Replace combination meter.
NO >> Replace oil level sensor.

4. CHECK ENGINE OIL LEVEL

1. Check engine oil level.
2. Replace combination meter if engine oil level is normal.

>> INSPECTION END

NORMAL OPERATING CONDITION
INFORMATION DISPLAY

INFORMATION DISPLAY : Description

INFOID:0000000001193798

OIL LEVEL

Oil level is not displayed after installation/removal of battery or combination meter. To display the oil level again, follow the steps below.

1. More than 5 minutes after turning ignition switch OFF, open the driver's door.
2. Turn ignition switch ON.

AMBIENT AIR TEMPERATURE

The displayed ambient air temperature on the information display may differ from the actual temperature because it is a corrected value calculated from the OAT sensor signal by the combination meter. Refer to MWI-22, "INFORMATION DISPLAY : System Description" for details on the correction process.

POSSIBLE DRIVING DISTANCE

The calculated possible driving distance may differ from the actual distance to empty if the refueling amount is approximately 4 ℓ (7/8 lmp gal) or less. This is because the refuel control (moves the fuel gauge needle quicker than normal judging that the driver is refueling the vehicle) is not performed in such a case.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000001193799

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.**

ON-VEHICLE REPAIR

COMBINATION METER

Exploded View

INFOID:0000000001193800

Refer to IP-11, "Exploded View".

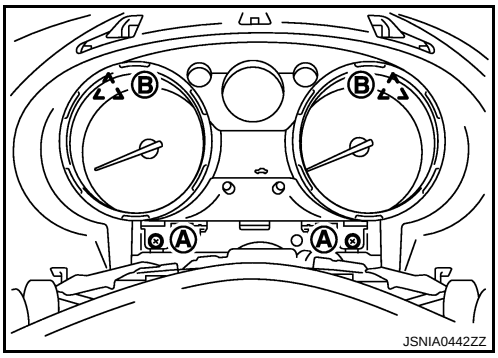
Removal and Installation

INFOID:0000000001193801

Removal

1. Remove the cluster lid A. Refer to IP-12, "Removal and Installation".
2. Remove steering column cover. Refer to IP-12, "Removal and Installation".
3. Remove screw (A) and connector, and then remove combination meter.

B : Clip



Installation

Install in the reverse order of removal.