SECTION MWI
METER, WARNING LAMP & INDICATOR

CONTENTS

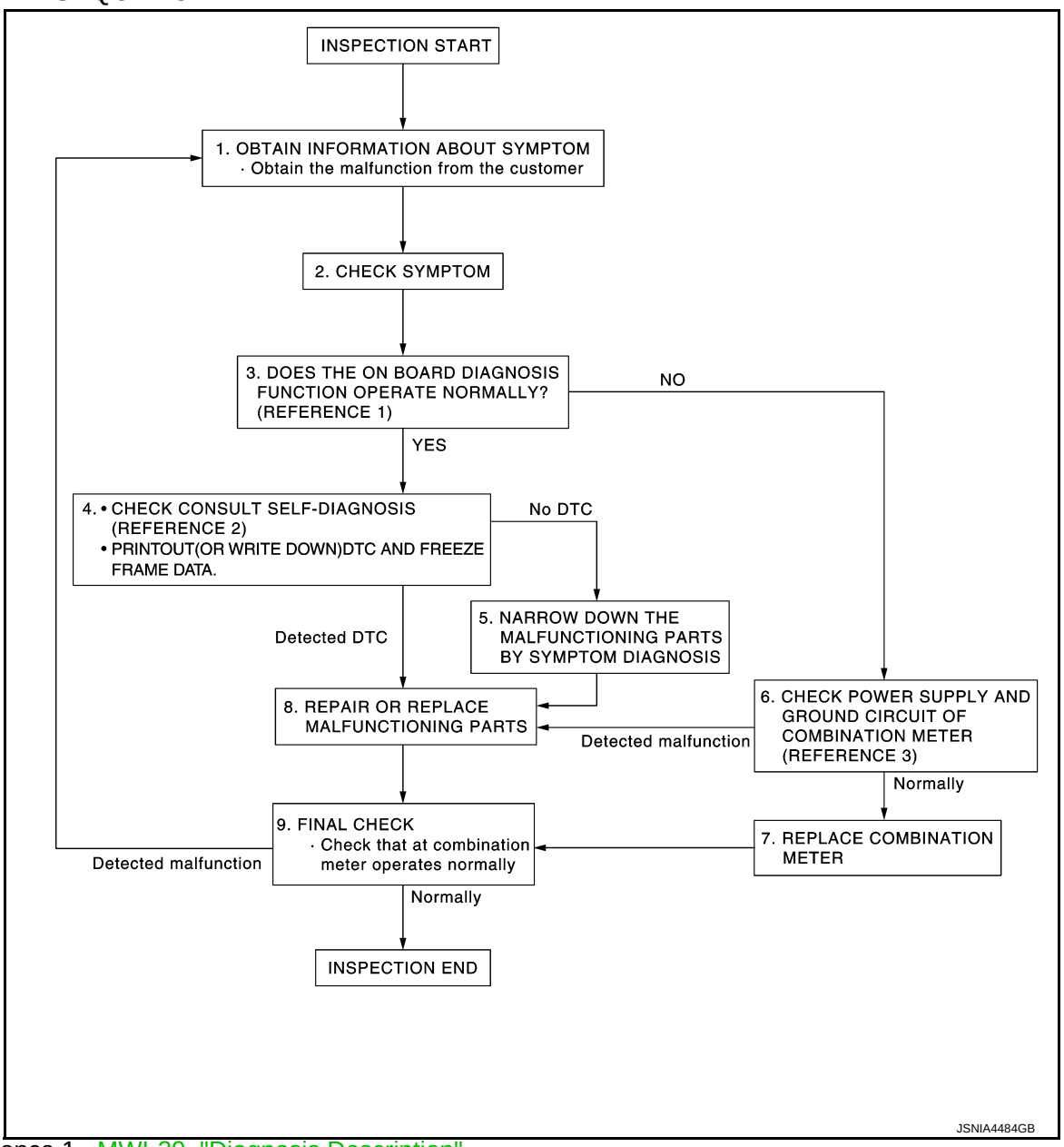
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work flow

INFOID:0000000007769531

OVERALL SEQUENCE



- Reference 1···MWI-29, "Diagnosis Description".
- Reference 2···MWI-57, "DTC Index".
- Reference 3···MWI-39, "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 that 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-29, "Diagnosis Description".

Does the on board diagnosis function operate normally?

YES >> GO TO 4.
NO >> GO TO 6.

4.CHECK CONSULT SELF-DIAGNOSIS RESULTS

1. Connect CONSULT and perform self-diagnosis. Refer to MWI-57, "DTC Index".
2. When DTC is detected, follow the instructions below:

- Record DTC and Freeze Frame Data.

Are self-diagnosis results normal?

YES >> GO TO 5.
NO >> GO TO 8.

5.NARROW DOWN THE MALFUNCTIONING PARTS BY SYMPTOM DIAGNOSIS

Perform symptom diagnosis and narrow down the malfunctioning parts.

>> GO TO 8.

6.CHECK COMBINATION METER POWER SUPPLY AND GROUND CIRCUITS

Inspect combination meter power supply and ground circuits. Refer to MWI-39, "COMBINATION METER : Diagnosis Procedure".

Is inspection result OK?

YES >> GO TO 7.
NO >> GO TO 8.

7.REPLACE COMBINATION METER

Replace combination meter.

>> GO TO 9.

8.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 9.

9.FINAL CHECK

Check that the combination meter operates normally.

Do they operate normally?

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

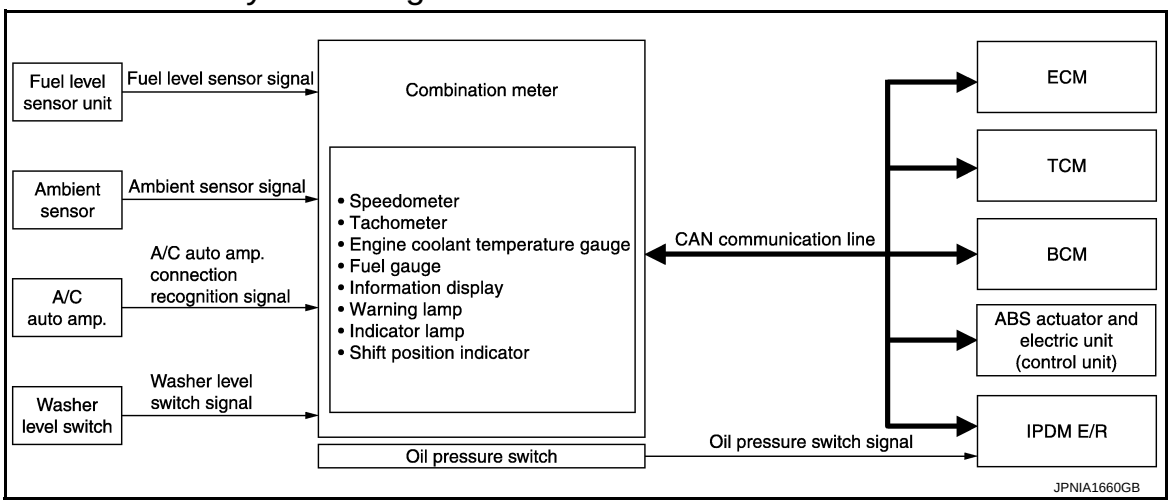
SYSTEM DESCRIPTION

METER SYSTEM

METER SYSTEM

METER SYSTEM : System Diagram

INFOID:0000000007769532



METER SYSTEM : System Description

INFOID:0000000007769533

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, warnings and information 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 following check function.

Meter drive circuit check function list

- Speedometer
- Tachometer

Segment display check function list

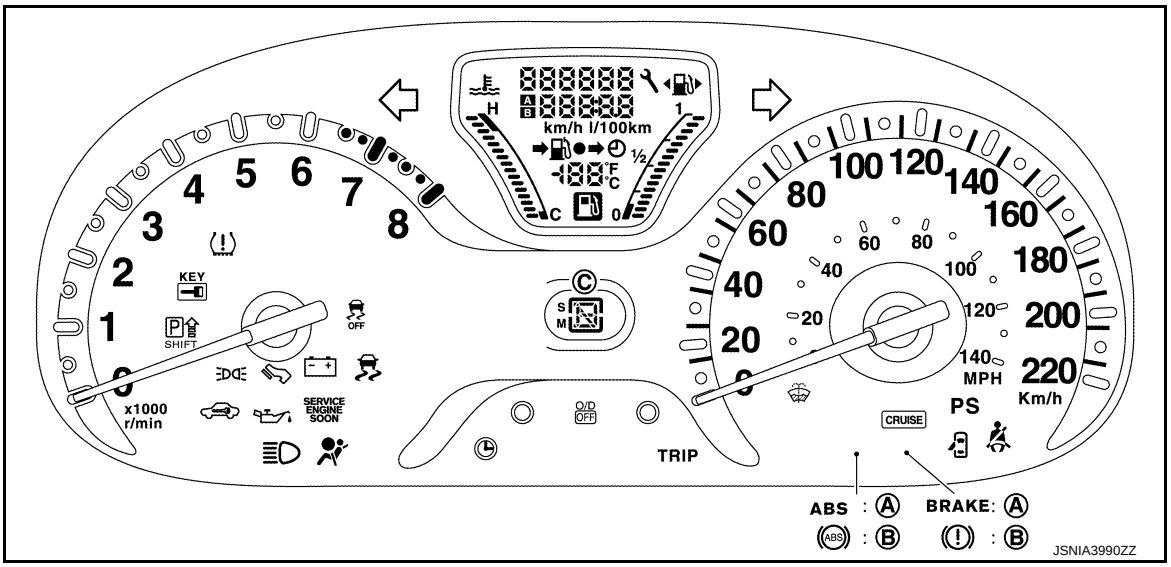
- Odo/trip meter
- Information display
- Engine coolant temperature gauge
- Fuel gauge
- Shift position indicator (CVT models)
- Start-up lamp (M/T models)

METER CONTROL FUNCTION LIST

System		Description	Reference
Meter/gauge	Speedometer	Indicates vehicle speed.	MWI-9, "SPEEDOMETER : System Description"
	Tachometer	Indicates engine speed.	MWI-11, "TACHOMETER : System Description"
	Fuel gauge	Indicates fuel level.	MWI-14, "FUEL GAUGE : System Description"
	Engine coolant temperature gauge	Indicates engine coolant temperature.	MWI-12, "ENGINE COOLANT TEMPERATURE GAUGE : System Description"

System		Description	Reference
Odo/trip meter		Displays vehicle distance.	MWI-15, "ODO/TRIP METER : System Description"
Shift position indicator		Displays shift position.	MWI-17, "SHIFT POSITION INDICATOR : System Description"
Warning lamp/ indicator lamp	Oil pressure warning lamp	The warning lamp turns ON or turns OFF, according to engine hydraulic pressure.	MWI-18, "WARNING LAMPS/INDICATOR LAMPS : System Description"
	Low washer fluid warning lamp	Turns ON or turns OFF, judged by the washer fluid level.	MWI-18, "WARNING LAMPS/INDICATOR LAMPS : System Description"
Meter illumination control	Meter illumination on/off control function	The meter illumination turns ON/OFF, according to the status of ignition switch and a cranking condition.	MWI-20, "METER ILLUMINATION CONTROL : System Description"
	Meter illumination control function	The meter illumination is switched between Daytime and Nighttime modes, according to the light switch position.	
Meter effect function	Engine-start effect function	When starting the engine, combination meter illumination and the movement of the tachometer and speedometer pointers provide the driver with the comfort.	MWI-22, "METER EFFECT FUNCTION : System Description"
Information display	Instantaneous fuel consumption	Displays instantaneous fuel consumption.	MWI-24, "INFORMATION DISPLAY : System Description"
	Average fuel consumption	Displays average fuel consumption.	
	Possible driving distance	Displays possible driving distance.	
	Average vehicle speed	Displays average vehicle speed.	
	Ambient air temperature	Displays ambient air temperature.	
	ICY warning (low ambient temperature)	Displays low ambient temperature warning.	
	Low fuel warning	Displays low fuel warning.	
	Fuel filler cap warning	Displays fuel filler cap warning.	
	Low tire pressure warning	Warns, according to tire inflation pressure.	
	Maintenance	Displays maintenance information.	
	Travel time	Displays travel time.	

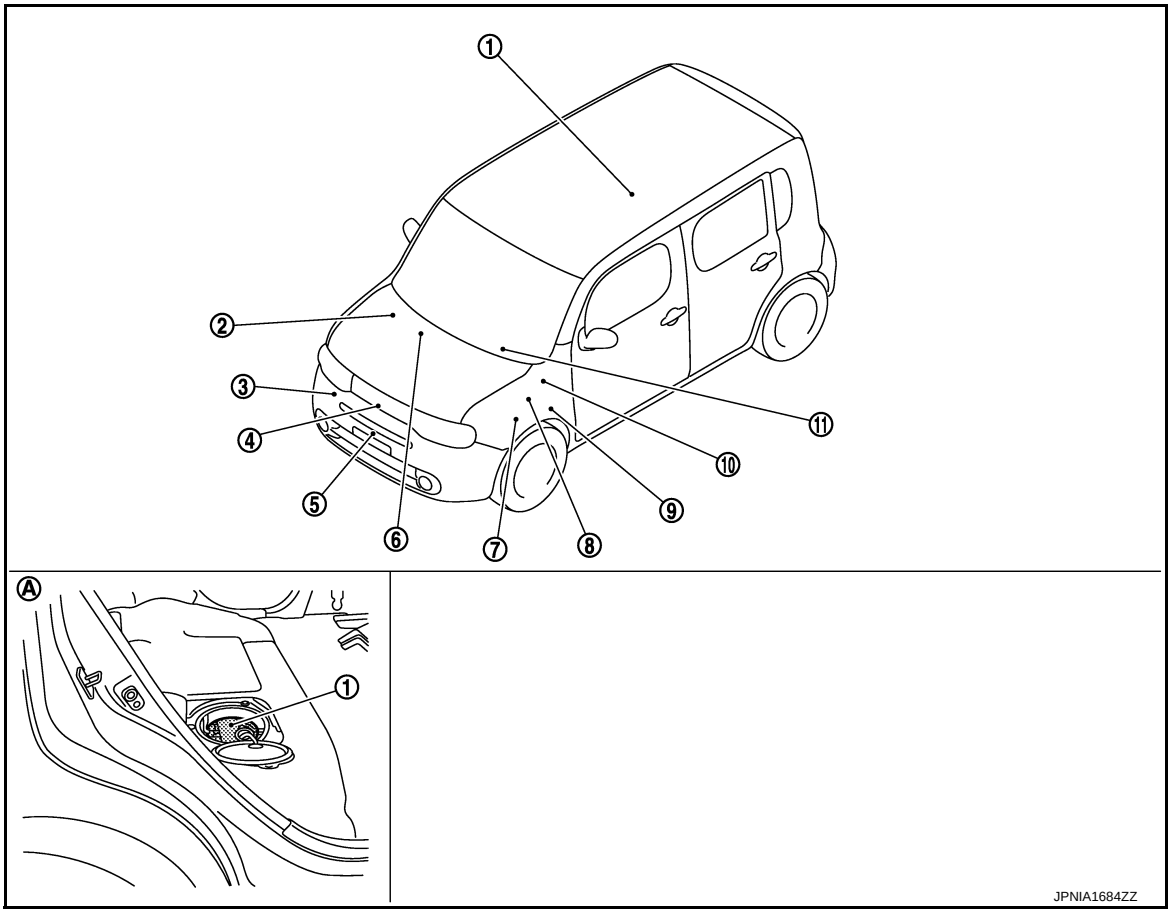
ARRANGEMENT OF COMBINATION METER



A. For USA
B. Except for USA
C. For A/T models (M/T models include start-up lamp here)

METER SYSTEM : Component Parts Location

INFOID:0000000007769534



1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".
7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM Refer to TM-70, "Component Parts Location".
10. BCM Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

METER SYSTEM : Component Description

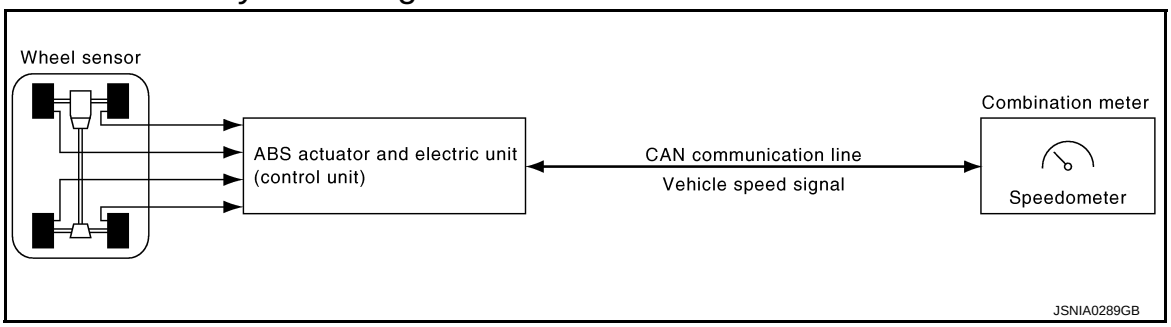
INFOID:0000000007769535

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 • Engine coolant temperature gauge • Fuel gauge • Warning lamps • Indicator lamps • Information display • Meter illumination control • Shift position indicator • Odo/trip meter • Meter effect function
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 via CAN communication.
Fuel level sensor unit	Refer to MWI-42, "Description".
Oil pressure switch	Refer to MWI-44, "Description".
ECM	Transmits the following signals to the combination meter via CAN communication. • Engine speed signal • Engine coolant temperature signal • Fuel consumption monitor signal • Engine status signal • Fuel filler cap warning display signal
ABS actuator and electric unit (control unit)	Transmits the vehicle speed signal to the combination meter via CAN communication.
BCM	Transmits the following signals to the combination meter via CAN communication. • Oil pressure switch signal • Position light request signal • Low tire pressure warning lamp signal
TCM	Transmits the shift position signal to the combination meter via CAN communication.
Ambient sensor	Transmits the ambient sensor signal to the combination meter.
A/C auto amp.	Transmits the A/C auto amp. connection recognition signal to the combination meter.
Washer level switch	Transmits the washer level signal to the combination meter.

SPEEDOMETER

SPEEDOMETER : System Diagram

INFOID:0000000007769536



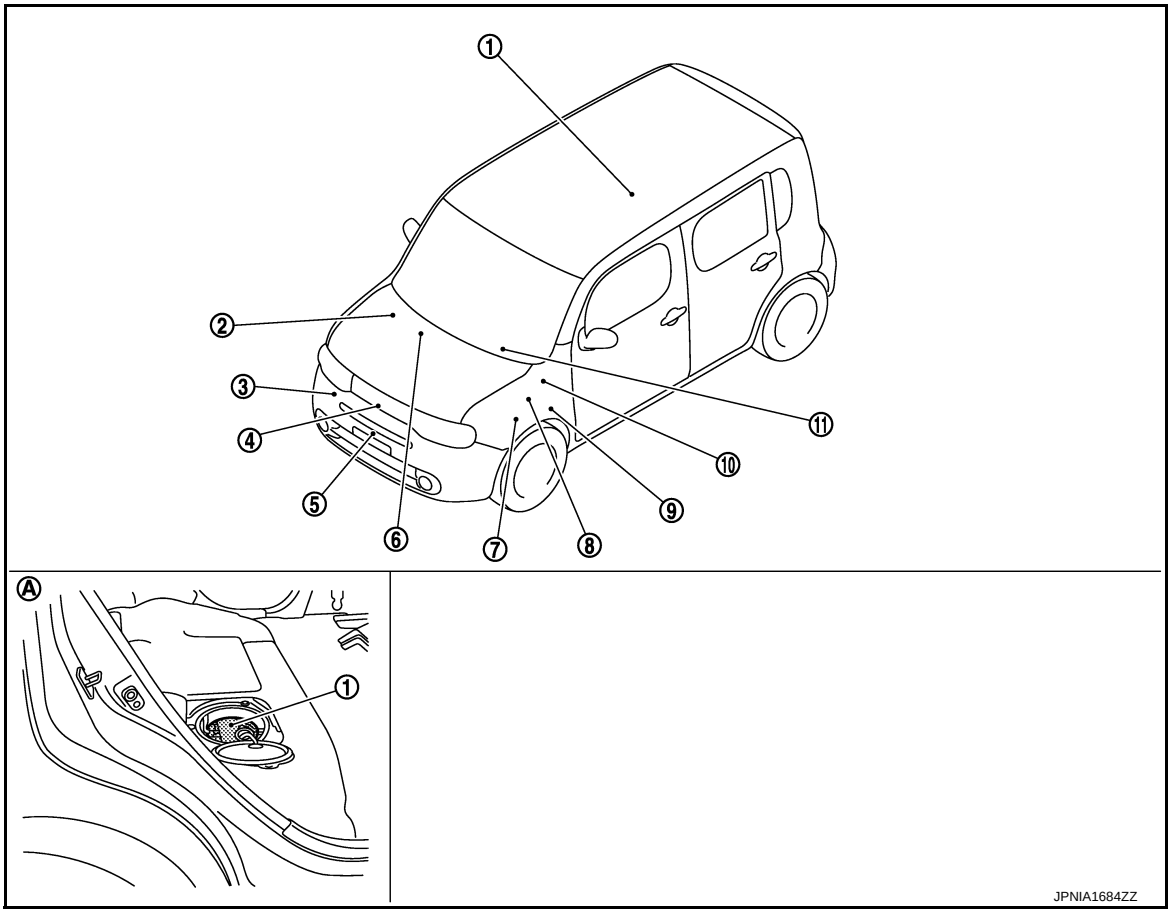
SPEEDOMETER : System Description

INFOID:0000000007769537

- 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:0000000007970942



1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".
7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM Refer to TM-70, "Component Parts Location".
10. BCM Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

SPEEDOMETER : Component Description

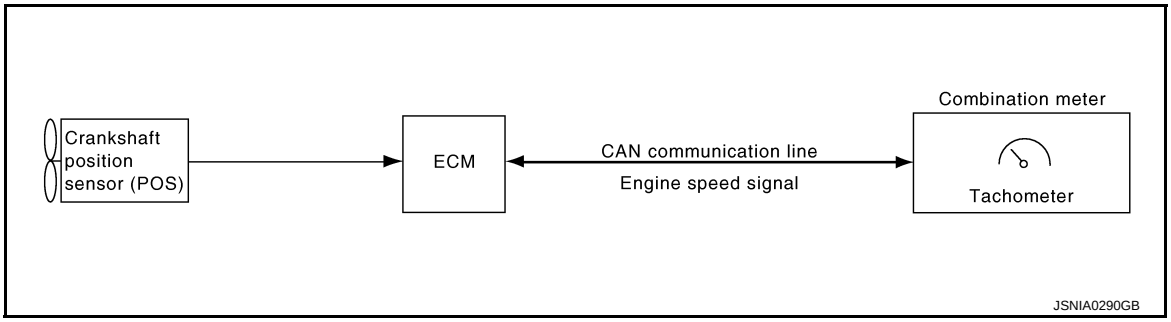
INFOID:0000000007769539

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 via CAN communication.

TACHOMETER

TACHOMETER : System Diagram

INFOID:0000000007769540



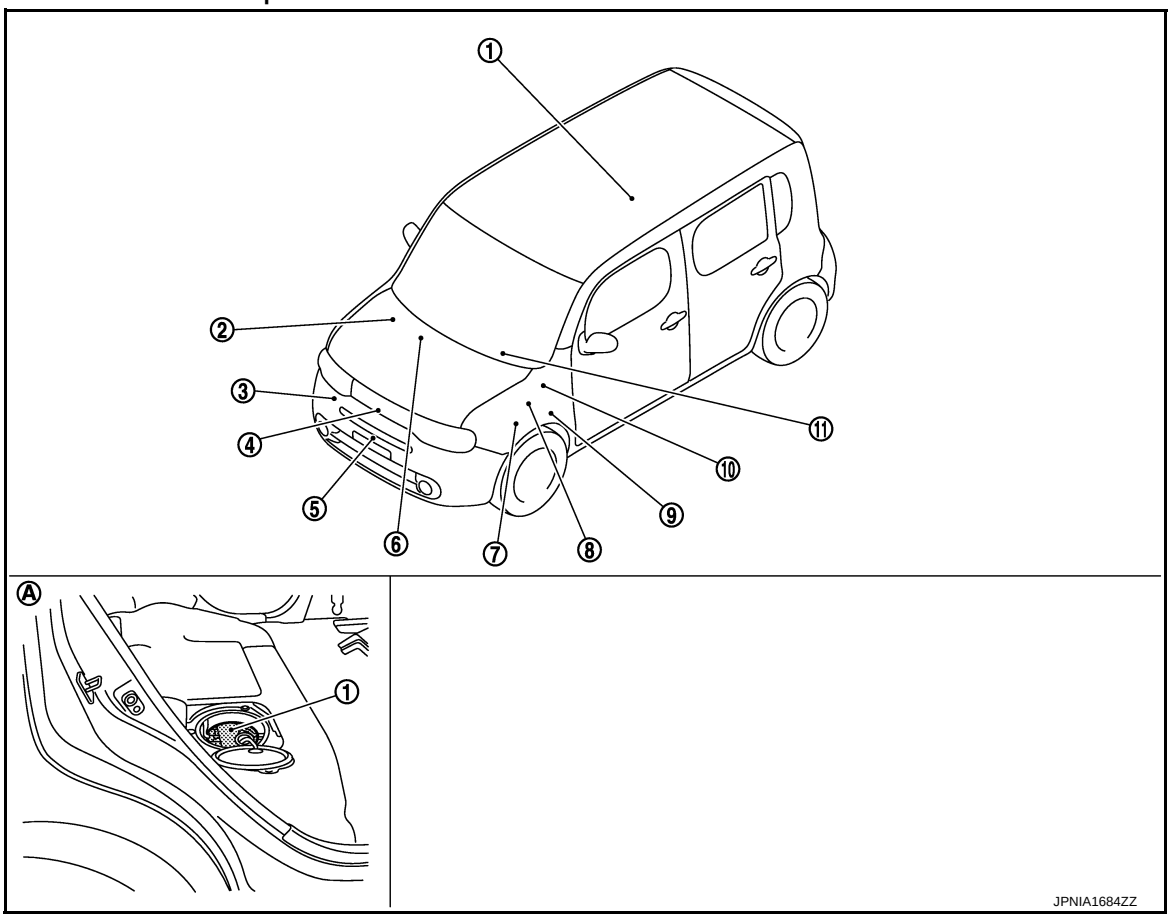
TACHOMETER : System Description

INFOID:0000000007769541

- ECM converts the pulse signal provided by the crankshaft position sensor to an engine speed signal and transmits it to the combination meter via CAN communication.
- 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:0000000007970943



1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".

7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM
   Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM
   Refer to TM-70, "Component Parts Location".
10. BCM
    Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

TACHOMETER : Component Description

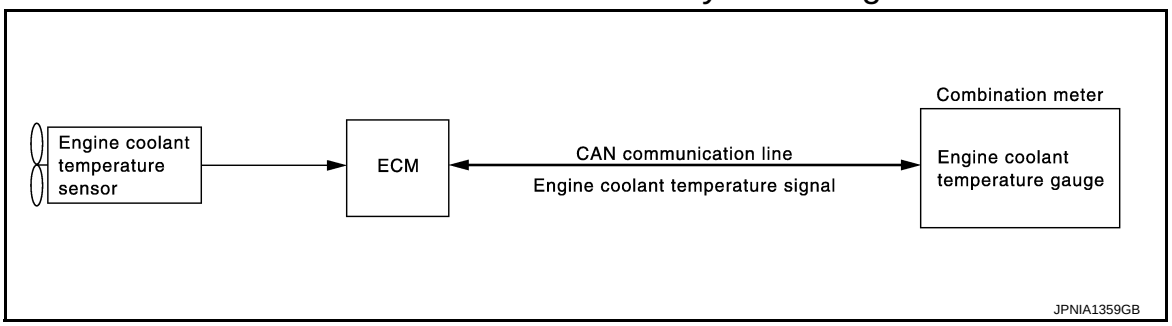
INFOID:0000000007769543

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 via CAN communication.

ENGINE COOLANT TEMPERATURE GAUGE

ENGINE COOLANT TEMPERATURE GAUGE : System Diagram

INFOID:0000000007769544



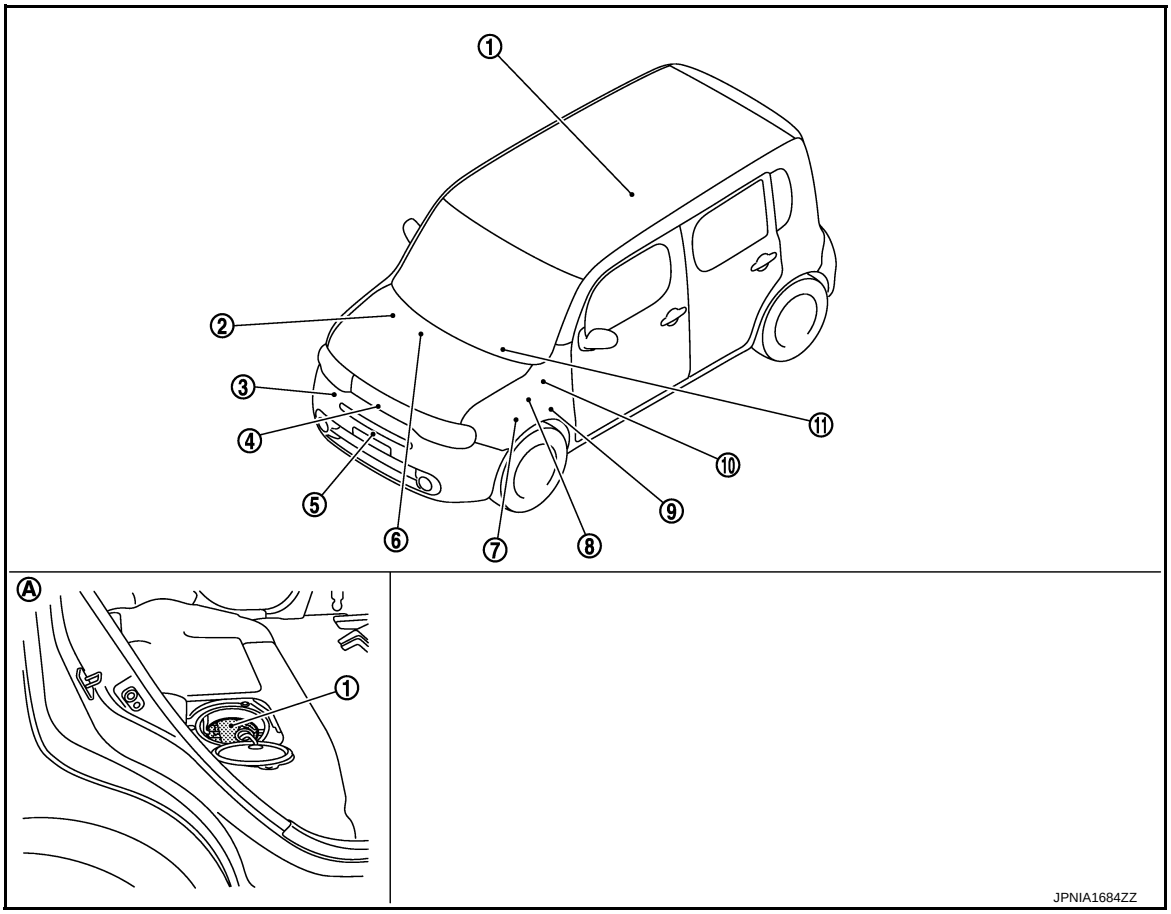
ENGINE COOLANT TEMPERATURE GAUGE : System Description

INFOID:0000000007769545

- 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 engine coolant temperature gauge according to the engine coolant temperature signal received via CAN communication.

ENGINE COOLANT TEMPERATURE GAUGE : Component Parts Location

INFOID:0000000007970944



1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".
7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM Refer to TM-70, "Component Parts Location".
10. BCM Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

ENGINE COOLANT TEMPERATURE GAUGE : Component Description

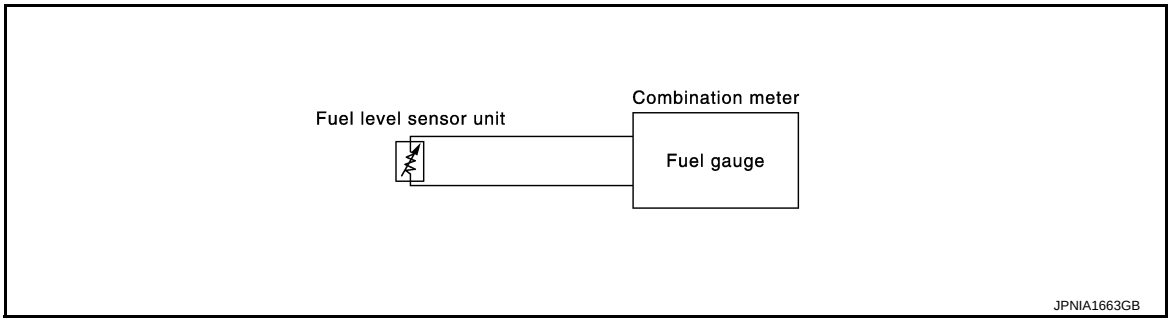
INFOID:0000000007769547

Unit	Description
Combination meter	Indicates the engine coolant temperature to the engine coolant 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:0000000007769548



FUEL GAUGE : System Description

INFOID:0000000007769549

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.

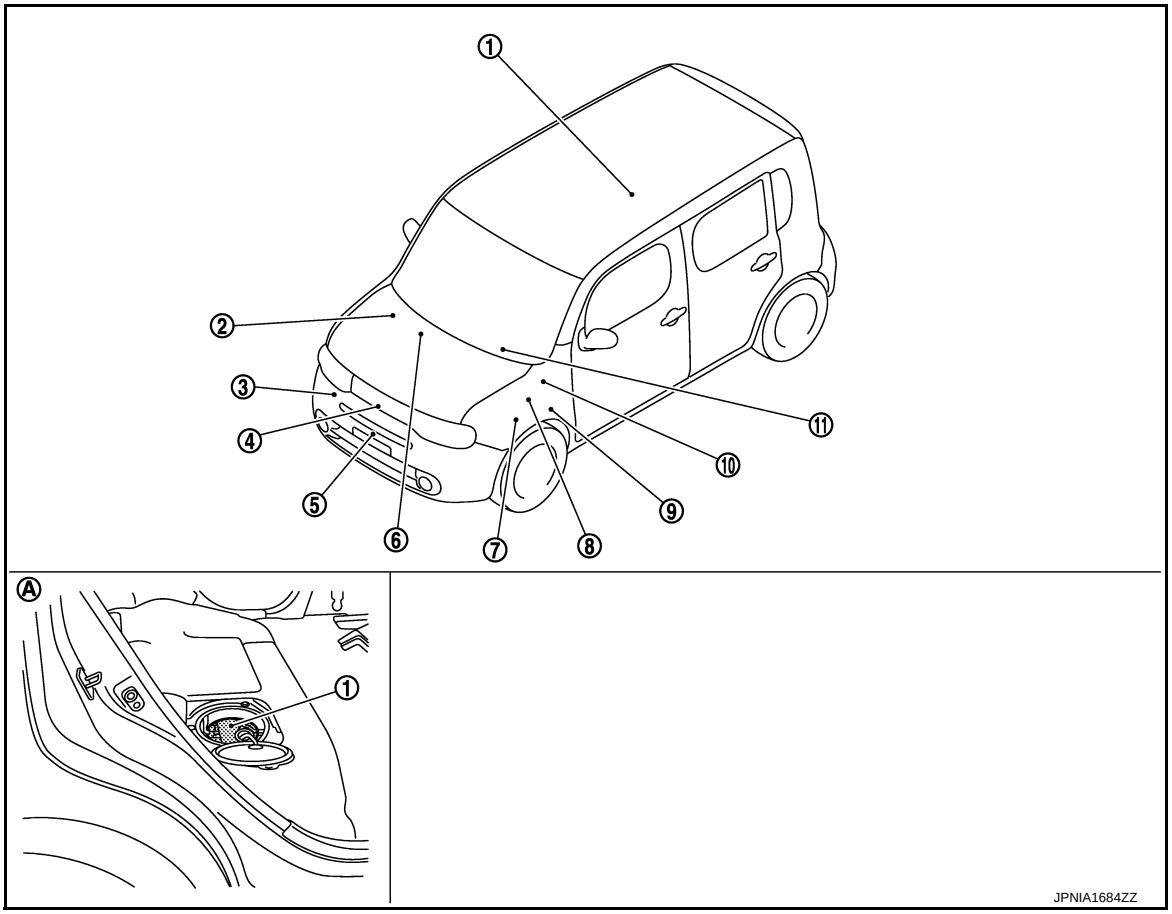
REFUEL CONTROL

The combination meter accelerates the fuel gauge segment if the all conditions listed below are met, or the ignition switch is ON from OFF.

- Ignition switch is ON position.
- The vehicle is not moving.
- The fuel level change by 15 ℓ (4 US gal, 3-1/4 Imp gal) or more.

FUEL GAUGE : Component Parts Location

INFOID:0000000007970945



1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".
7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM Refer to TM-70, "Component Parts Location".
10. BCM Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

FUEL GAUGE : Component Description

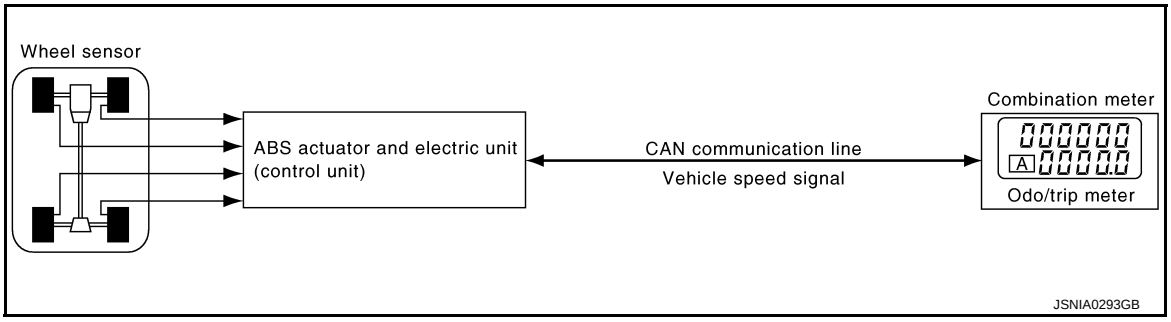
INFOID:0000000007769551

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-42, "Description".

ODO/TRIP METER

ODO/TRIP METER : System Diagram

INFOID:0000000007769552



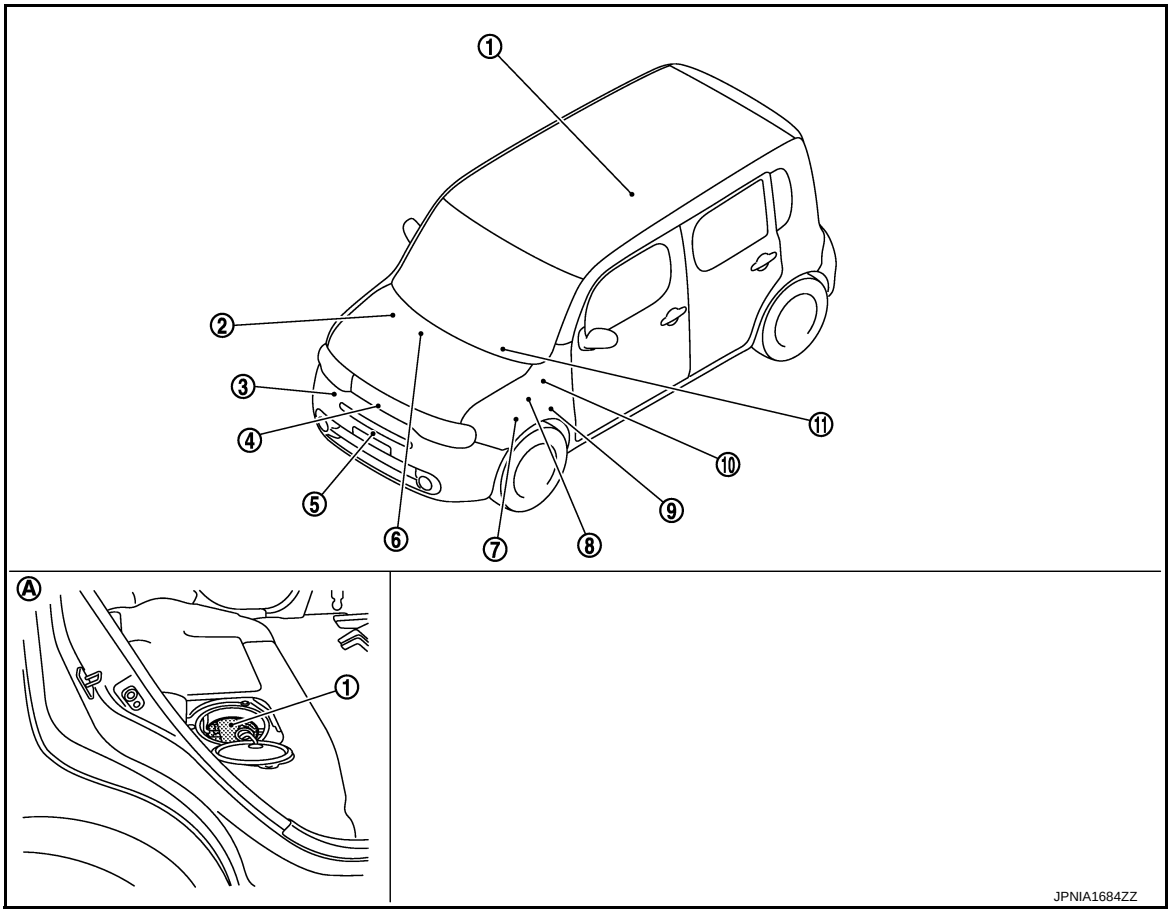
ODO/TRIP METER : System Description

INFOID:0000000007769553

- 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:0000000007970946



1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".
7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM Refer to TM-70, "Component Parts Location".
10. BCM Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

ODO/TRIP METER : Component Description

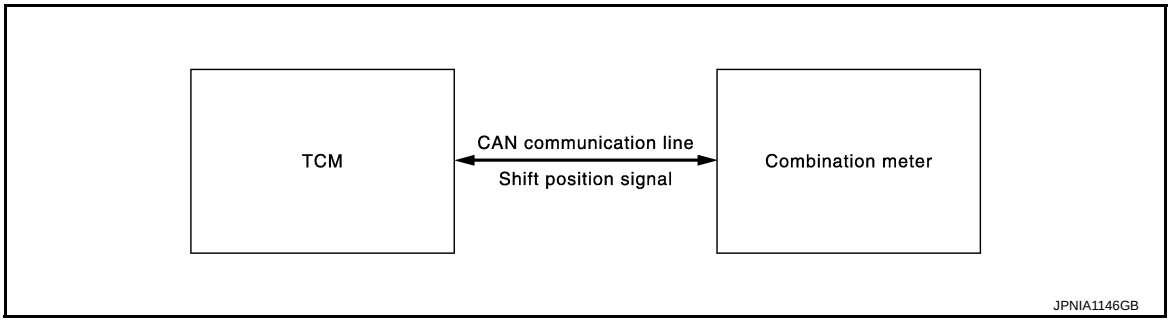
INFOID:0000000007769555

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:0000000007769556



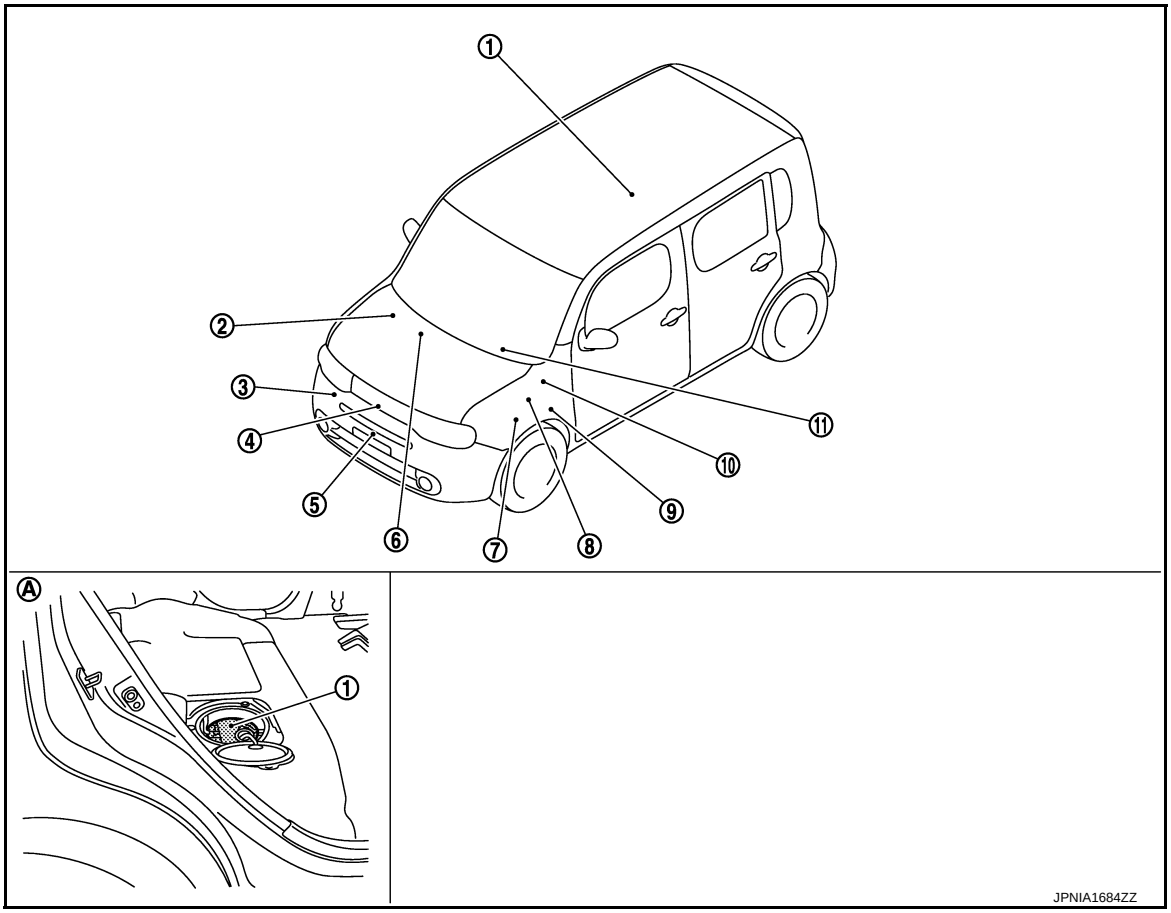
SHIFT POSITION INDICATOR : System Description

INFOID:0000000007769557

The combination meter receives the shift position signal from TCM via CAN communication, and displays the shift position to the shift position indicator.

SHIFT POSITION INDICATOR : Component Parts Location

INFOID:0000000007970947



1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".

7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM
   Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM
   Refer to TM-70, "Component Parts Location".
10. BCM
    Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

SHIFT POSITION INDICATOR : Component Description

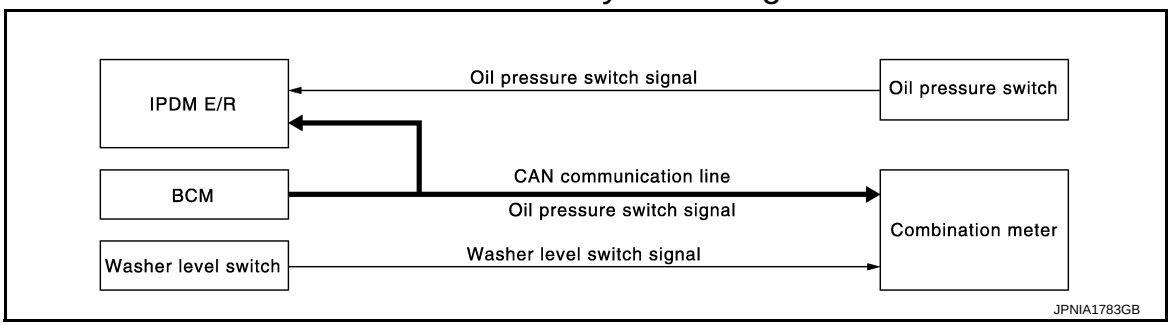
INFOID:0000000007769559

Unit	Description
Combination meter	Displays the shift position on the shift position indicator with shift position signal received from TCM via CAN communication.
TCM	Transmits shift position signal to the combination meter via CAN communication.

WARNING LAMPS/INDICATOR LAMPS

WARNING LAMPS/INDICATOR LAMPS : System Diagram

INFOID:0000000007769560



WARNING LAMPS/INDICATOR LAMPS : System Description

INFOID:0000000007769561

OIL PRESSURE WARNING LAMP

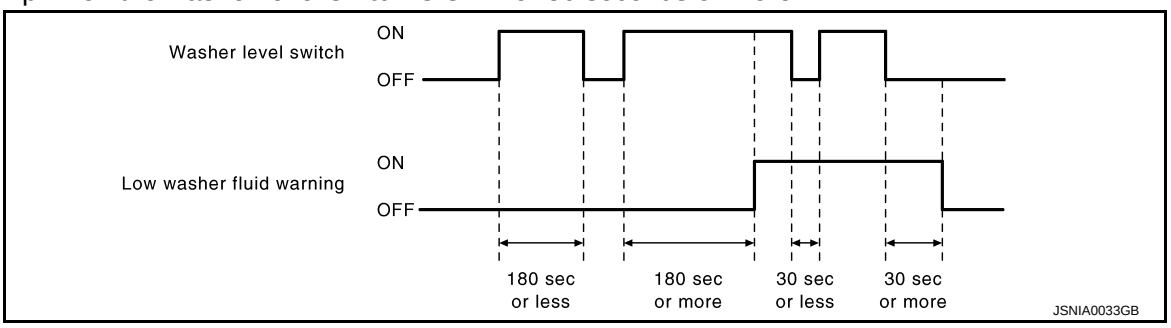
- IPDM E/R reads the ON/OFF signals from the oil pressure switch and transmits the oil pressure switch signal to the combination meter via BCM with the CAN communication.
- The combination meter turns the oil pressure warning lamp ON (at the time of a reduction in hydraulic pressure)/OFF (except at the time of a reduction in hydraulic pressure) according to the oil pressure switch signal received via CAN communication.

LOW WASHER FLUID WARNING LAMP (FOR CANADA)

The combination meter turns on a low washer fluid warning lamp judged by the washer level switch signal from the washer level switch.

Warning Operation Condition

- Turns on the warning lamp when the washer level switch is ON for 180 seconds or more. Turns off the warning lamp when the washer level switch is OFF for 30 seconds or more.



WARNING LAMPS/INDICATOR LAMPS : Component Parts Location

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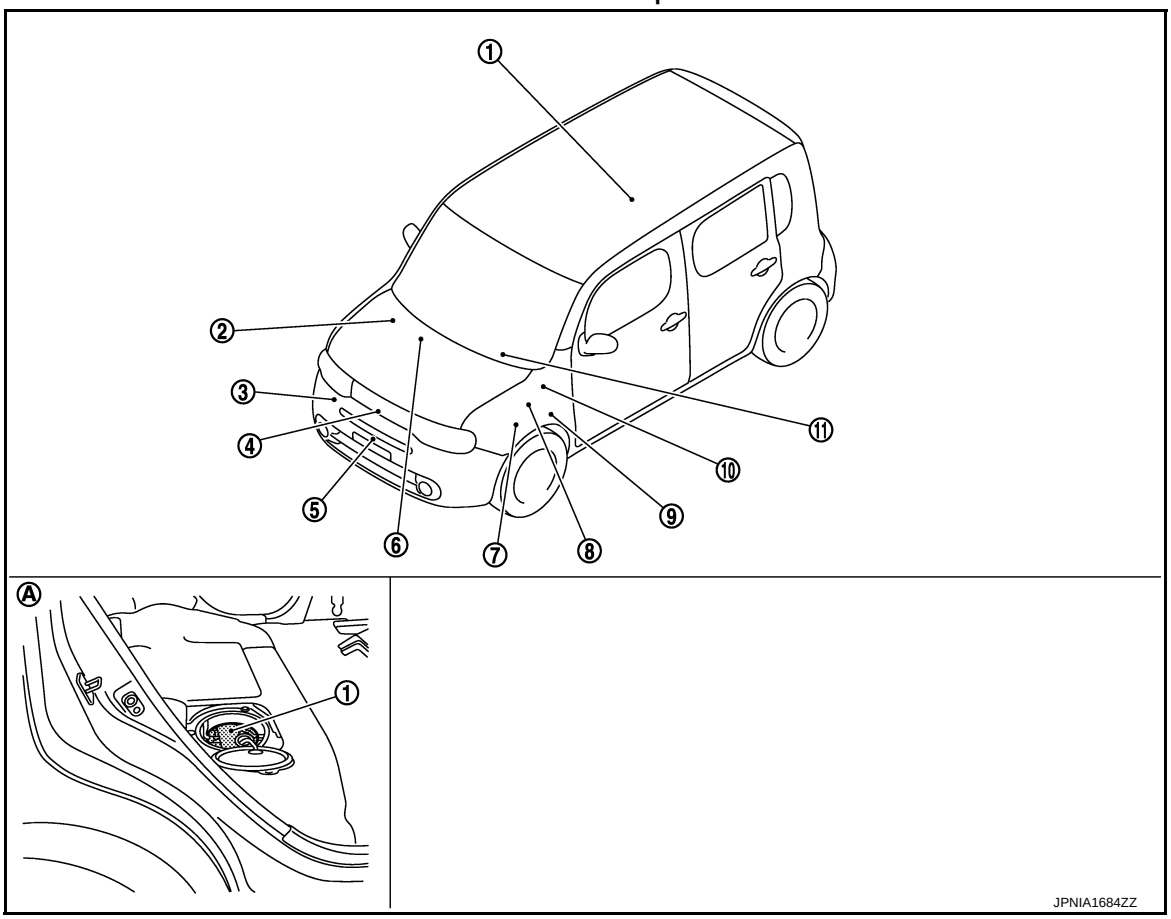


1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".
7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM Refer to TM-70, "Component Parts Location".

10. BCM
Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

WARNING LAMPS/INDICATOR LAMPS : Component Description

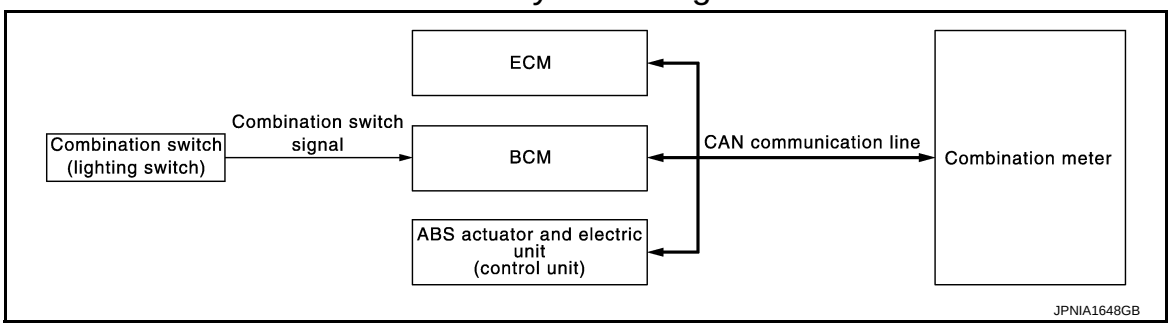
INFOID:0000000007769563

Unit	Description
Combination meter	• Turns the oil pressure warning lamp ON/OFF according to the oil pressure switch signal received from BCM via CAN communication. • Receives the washer level switch signal from the washer level switch.
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 and CAN communication.
Oil pressure switch	Refer to MWI-44, "Description".
BCM	Transmits the oil pressure switch signal received from IPDM E/R via CAN communication to the combination meter via CAN communication.
Washer level switch	Transmits the washer level switch signal to the combination meter.

METER ILLUMINATION CONTROL

METER ILLUMINATION CONTROL : System Diagram

INFOID:0000000007769564



METER ILLUMINATION CONTROL : System Description

INFOID:0000000007769565

METER ILLUMINATION ON/OFF CONTROL FUNCTION

The combination meter receives the following signals to control meter illumination.

Signal name	Signal source
Ignition signal	—
Engine status signal (CAN communication)	ECM
Vehicle speed signal (CAN communication)	ABS actuator and control unit (control unit)

Turns ON Condition
Ignition switch ON

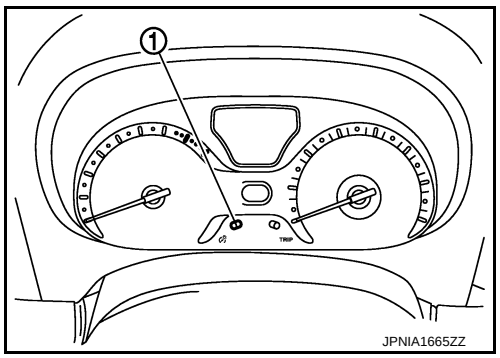
Turns OFF Condition
If any of the following conditions is fulfilled.
- During a crank with vehicle speed less than 1 km/h (0.6 MPH)
- Ignition switch OFF or ACC

METER ILLUMINATION CONTROL FUNCTION

- Combination meter is transferred to nighttime mode with position light request signal from BCM via CAN communication.

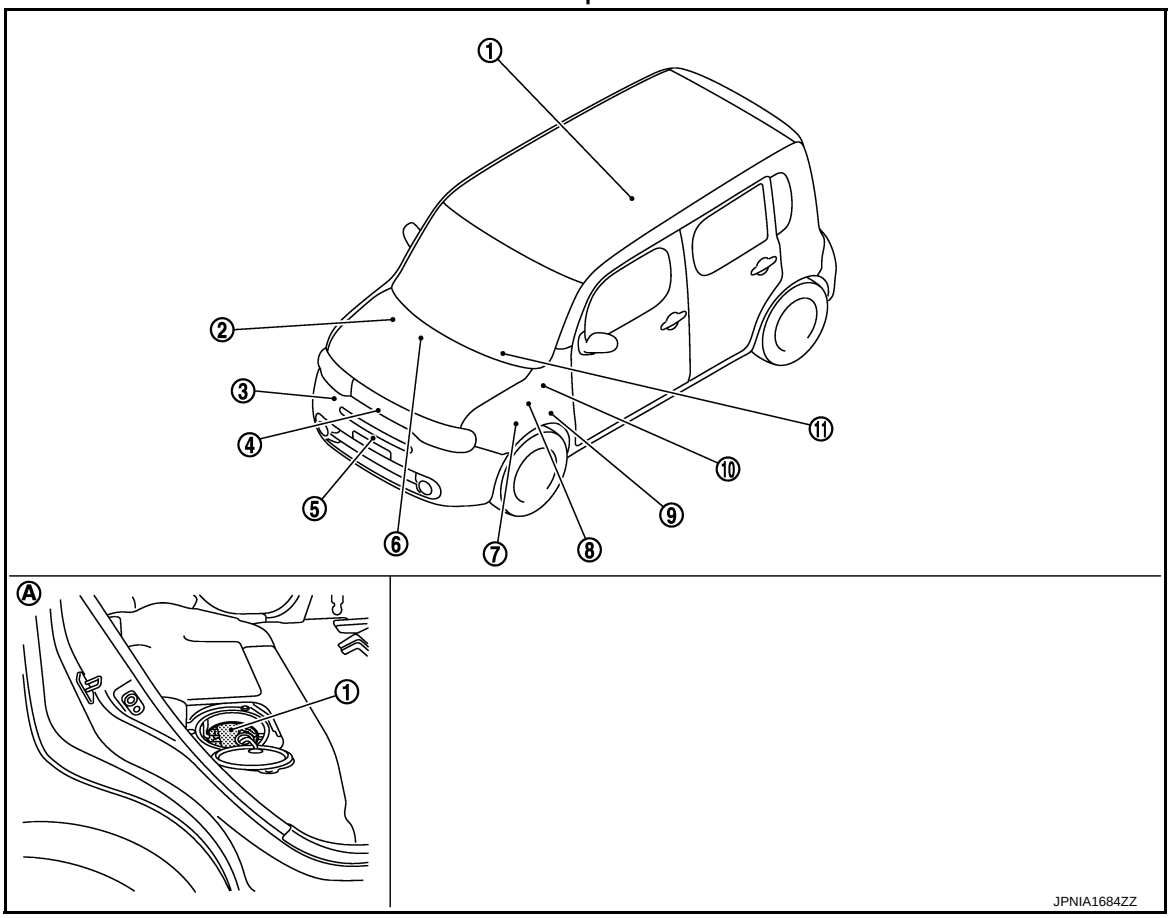
- Meter illumination level can be adjusted in following steps using the illumination control switch (1).

Condition	Steps
Daytime mode	22
Nighttime mode	22



METER ILLUMINATION CONTROL : Component Parts Location

INFOID:0000000007970949



1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".
7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM Refer to TM-70, "Component Parts Location".

10. BCM
Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

METER ILLUMINATION CONTROL : Component Description

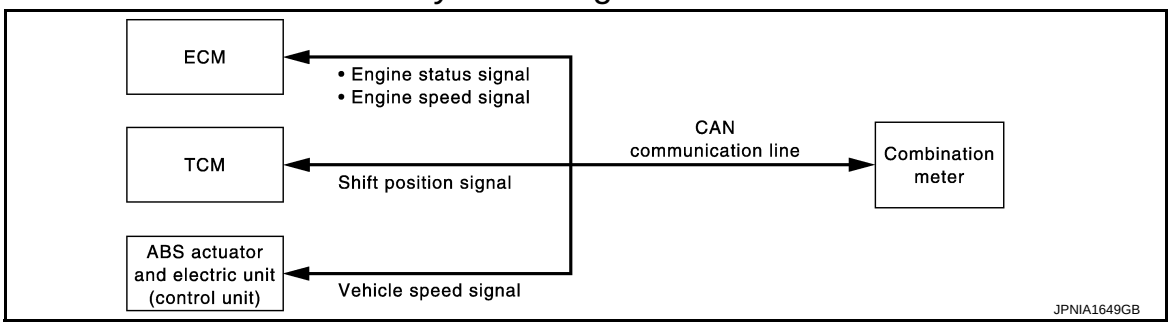
INFOID:0000000007769567

Unit	Description
Combination meter	Controls the meter illumination with the meter control switch signal from the meter control switch and the position light request signal from BCM via CAN communication.
ECM	Transmits the engine status signal to the combination meter via CAN communication.
ABS actuator and electric unit (control unit)	Transmits the vehicle speed signal to the combination meter via CAN communication.
BCM	Transmits the position light request signal to the combination meter via CAN communication.
Combination switch (lighting switch)	Using the combination switch reading function, BCM reads the combination switch status.

METER EFFECT FUNCTION

METER EFFECT FUNCTION : System Diagram

INFOID:0000000007769568



METER EFFECT FUNCTION : System Description

INFOID:0000000007769569

ENGINE-START EFFECT FUNCTION

For CVT Models
When "engine start" is read, the effect of comfort starts only once by turning on combination meter illumination stepwise and sweeping the needles of speedometer and tachometer.

For M/T Models
When "engine start" is read, the effect of comfort starts only once by turning on combination meter illumination and start-up lamp stepwise and sweeping the needles of speedometer and tachometer.

Outline of Control System
System control is provided when all of the following conditions are met.

Operating condition		Signal name	Signal source
Ignition switch	ON	Ignition signal	—
Shift position*	P-range	Shift position signal (CAN communication)	TCM

Operating condition		Signal name	Signal source
Engine status	More than 500 rpm	Engine speed signal (CAN communication)	ECM
	Except when cranking	Engine status signal (CAN communication)	
Vehicle speed	Less than 1 km/h (0.6 MPH)	Vehicle speed signal (CAN communication)	ABS actuator and electric unit (control unit)

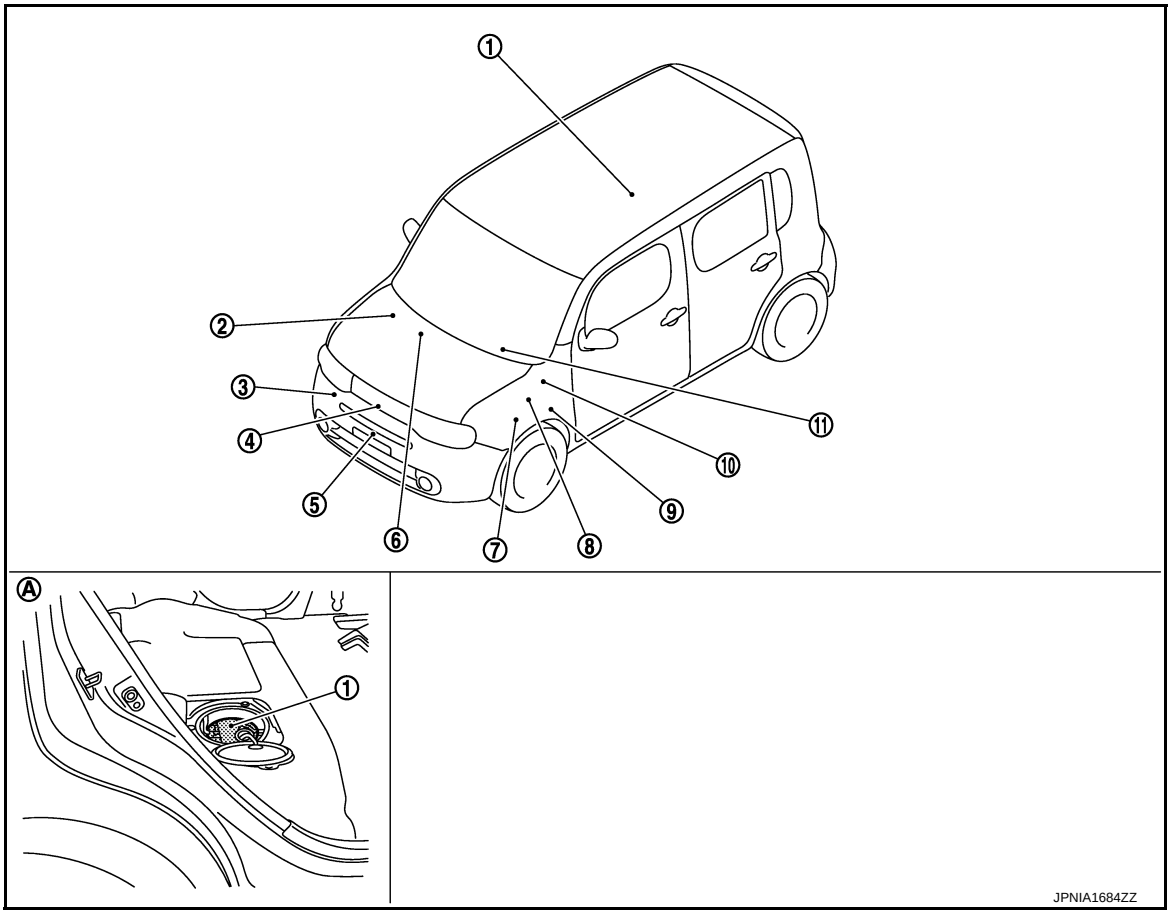
*: For CVT models

NOTE:

The engine-start effect function ends if any one of the above conditions is lost during the activation of this function.

METER EFFECT FUNCTION : Component Parts Location

INFOID:0000000007970950



1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".
7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM Refer to TM-70, "Component Parts Location".

10. BCM
Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

METER EFFECT FUNCTION : Component Description

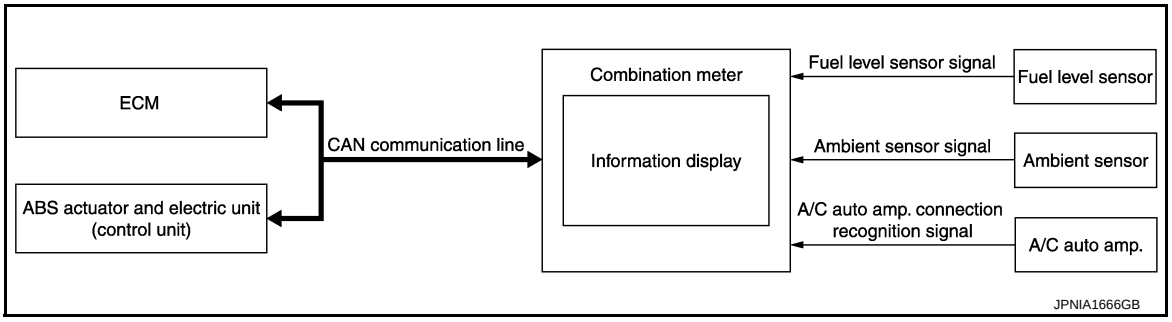
INFOID:0000000007769571

Unit	Description
Combination meter	Receives signals from each unit with the CAN communication and performs meter effect.
ECM	Transmits engine speed signal and engine status signal to the combination meter via CAN communication.
TCM	Transmits shift position signal to the combination meter via CAN communication.
ABS actuator and electric unit (control unit)	Transmits vehicle speed signal to the combination meter via CAN communication.

INFORMATION DISPLAY

INFORMATION DISPLAY : System Diagram

INFOID:0000000007769572



INFORMATION DISPLAY : System Description

INFOID:0000000007769573

DESCRIPTION

- The combination meter inputs the information required to control the operation of information display by using the communication signals and others from each units and sensors.
- The combination meter incorporates a trip computer that displays the warning/information according to the information received from various units and sensors.

INSTANTANEOUS FUEL CONSUMPTION

The combination meter calculates instantaneous fuel consumption based on the following signals, and the calculated value is displayed on the information display.

Signal name	Signal source
Fuel consumption monitor signal (CAN communication)	ECM
Vehicle speed signal (CAN communication)	ABS actuator and electric unit (control unit)

NOTE:

- Instantaneous fuel consumption on the information display is updated approximately every 0.5 seconds.
- Instantaneous fuel consumption on the information display shows 0 l/100km (0 mpg) when vehicle speed is 0 km/h (0 MPH).

AVERAGE FUEL CONSUMPTION

The combination meter calculates average fuel consumption based on the following signals, and the calculated value is displayed on the information display.

Signal name	Signal source
Fuel consumption monitor signal (CAN communication)	ECM
Vehicle speed signal (CAN communication)	ABS actuator and electric unit (control unit)

NOTE:
- Average fuel consumption on the information display is updated approximately every 30 seconds.
- Soon after a reset or when the ignition switch is turned ON right after battery removal and installation, "–––" is displayed until after a travel of 30 seconds and approximately 500 m (0.31 mile).

POSSIBLE DRIVING DISTANCE

The combination meter calculates possible driving distance based on the following signals, and the calculated value is displayed on the information display.

Signal name	Signal source
Fuel level sensor signal	Fuel level sensor unit
Fuel consumption monitor signal (CAN communication)	ECM
Vehicle speed signal (CAN communication)	ABS actuator and electric unit (control unit)

NOTE:
- Possible driving distance on the information display is updated approximately every 30 seconds.
- When the ignition switch is turned from OFF to ON, "–––" is displayed until after a travel of approximately 500 m (0.31 mile).
- The indicated values may not match each other when refueling with the ignition switch ON. Refer to MWI-87, "INFORMATION DISPLAY : Description".

AVERAGE VEHICLE SPEED

The combination meter calculates average vehicle speed based on the following signals, and the calculated value is displayed on the information display.

Signal name	Signal source
Ignition signal	—
Vehicle speed signal (CAN communication)	ABS actuator and electric unit (control unit)

NOTE:
- Average vehicle speed on the information display is updated approximately every 30 seconds.
- Soon after a reset or when the ignition switch is turned ON right after battery removal and installation, "–––" is displayed until after a 30 seconds.

AMBIENT AIR TEMPERATURE (FOR AUTO AIR CONDITIONING MODELS)

- The combination meter corrects an indicated temperature, based on various signals.
- The combination meter calculates ambient air temperature based on the following signals, and the calculated value is displayed on the information display.

Signal name	Signal source
Ignition signal	—
Ambient sensor signal	Ambient sensor
A/C auto amp. connection recognition signal	A/C auto amp.
Vehicle speed signal (CAN communication)	ABS actuator and electric unit (control unit)

Correction Process (Temperature indicated soon after the ignition switch ON)

A temperature indicated soon after the ignition switch is turned ON depends on the time from the ignition switch OFF to ON and a temperature detected by the ambient sensor.

When any condition described below is met, an ambient sensor-detected temperature is indicated.
- Time from the ignition switch OFF to ON ≥ Predetermined time
- Sensor-detected temperature < Temperature at the last ignition switch OFF

When all the conditions described below are met, the temperature at the last ignition switch OFF is indicated.
- Time from the ignition switch OFF to ON < Predetermined time
- Sensor-detected temperature ≥ Temperature at the last ignition switch OFF

Correction Process (Temperature at the Ignition switch ON)

A temperature indicated when the ignition switch is ON depends on a vehicle speed, an ambient sensor-detected temperature, and traveling time.

The temperature on the information display is corrected to an ambient sensor-detected temperature when the following condition is met.
- Ambient sensor-detected temperature < Temperature on the information display

A temperature on the information display is not updated when the following condition is met.
- Ambient sensor-detected temperature ≥ Temperature on the information display
- Vehicle speed ≤ 20 km/h (12 MPH)

A temperature on the information display slowly rises to an ambient sensor-detected temperature when the following condition is met.
- Ambient sensor-detected temperature ≥ Temperature on the information display
- Vehicle speed ≥ 20 km/h (12 MPH)

A temperature on the information display rapidly rises to an ambient sensor-detected temperature when the following condition is met.
- Ambient sensor-detected temperature ≥ Temperature on the information display
- Vehicle speed ≥ 20 km/h (12 MPH)
- When driving more than set time

A/C Auto Amp. Connection Recognition

The combination meter judges from A/C auto amp. connection recognition signals that A/C auto amp. is connected and indicates an ambient air temperature on the information display.

NOTE:
- After an ignition switch is turned ON, "——" is displayed until after a 2.5 seconds.
- The ambient sensor input value that is displayed on "Data Monitor" of CONSULT is the value before the correction. It may not match the indicated temperature on the information display.
- After removal and installation of the battery and combination meter, an ambient sensor-detected temperature is indicated on the information display.
- Depending on engine heat or heat on the road surfaces, an ambient temperature may be indicated higher than actual one.

ICY WARNING (LOW AMBIENT AIR TEMPERATURE)

Based on an ambient temperature indication, the combination meter blinks the ambient temperature indication to warn the driver of a low ambient temperature.

Warning Operation Condition

Information display indication temperature ≤ 3°C (37°F)

Warning Cancel Condition

Warning is canceled if any of the following conditions is fulfilled.
- Information display indication temperature ≥ 4°C (39°F)
- 60 seconds after the start of warning indication

LOW FUEL WARNING

Combination meter indicates the low fuel warning judged by the fuel level sensor signal received from fuel level sensor unit.

Warning Operation Condition

Fuel level: Approx. 9.5 ℓ (2-1/2 US gal, 2-1/8 Imp gal) or less [1.5 ℓ (3/8 US gal, 3/8 Imp gal) fuel residues included].

FUEL FILLER CAP WARNING

- The combination meter judges showing/hiding of "fuel filler cap warning", according to the signals below:

Signal name	Signal source
Ignition signal	—
Fuel filler cap warning display signal (CAN communication)	ECM

- For further information, refer to EC-104, "System Description" (Except for California) or EC-587, "System Description" (For California).

LOW TIRE PRESSURE WARNING

- The combination meter judges showing/hiding of “low tire pressure warning”, according to the signals below:

Signal name	Signal source
Ignition signal	—
Low tire pressure warning lamp signal (CAN communication)	BCM

- For further information, refer to WT-8, "TIRE PRESSURE MONITORING SYSTEM : System Description".

MAINTENANCE (FOR CANADA)

The remaining distance from the set maintenance distance is displayed.

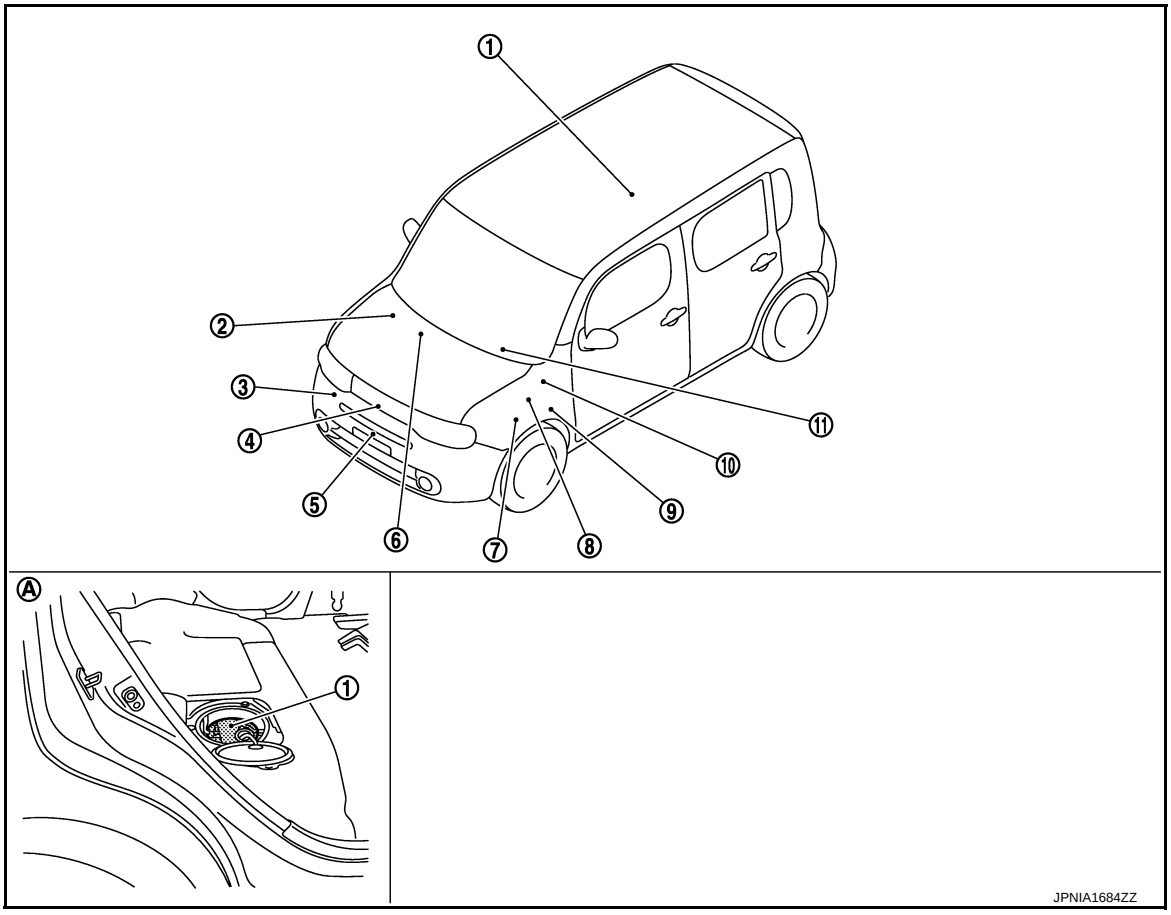
Items	Setting range	Setting unit	Description
Maintenance	0 – 30,000 km (0 – 18,000 miles)	1,000 km (500 miles)	The remaining distance from the set distance is displayed for 5 seconds after the ignition switch is turned ON.

TRAVEL TIME (FOR CANADA)

The combination meter measures and displays travel time (ignition switch ON time).

INFORMATION DISPLAY : Component Parts Location

INFOID:0000000007970951



1. Fuel level sensor unit
2. ABS actuator and electric unit (control unit) Refer to BRC-12, "Component Parts Location".
3. Washer level switch Refer to WW-9, "Component Parts Location".
4. Ambient sensor Refer to HAC-24, "Component Parts Location".
5. Oil pressure switch Refer to EM-88, "Exploded View".
6. A/C auto amp. (auto A/C models) Refer to HAC-24, "Component Parts Location".
7. IPDM E/R
   - Refer to PCS-6, "Component Parts Location" (with I-KEY).
   - Refer to PCS-35, "Component Parts Location" (without I-KEY).
8. ECM Refer to EC-41, "Component Parts Location" (Except for California) or EC-517, "Component Parts Location" (For California).
9. TCM Refer to TM-70, "Component Parts Location".
10. BCM Refer to BCS-10, "Component Parts Location" (With intelligent key system) or BCS-88, "Component Parts Location" (Without intelligent key system).
11. Combination meter

A. Under of right side rear seat

INFORMATION DISPLAY : Component Description

INFOID:0000000007769575

Unit	Description
Combination meter	Controls the information display according to the signal received from each unit.
Fuel level sensor unit	Refer to MWI-42, "Description".
ECM	Transmits the fuel consumption monitor signal and fuel filler cap warning display signal to the combination meter via CAN communication.
ABS actuator and electric unit (control unit)	Transmits the vehicle speed signal to the combination meter via CAN communication.
Ambient sensor	Detects the ambient air temperature and transmits the ambient sensor signal to the combination meter.
A/C auto amp.	Transmits the A/C auto amp. connection recognition signal to the combination meter.

DIAGNOSIS SYSTEM (METER)

Diagnosis Description

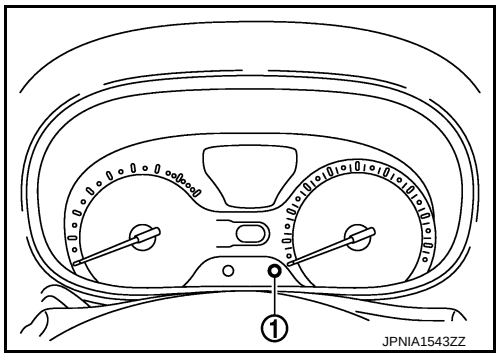
INFOID:0000000007769576

SELF-DIAGNOSIS MODE

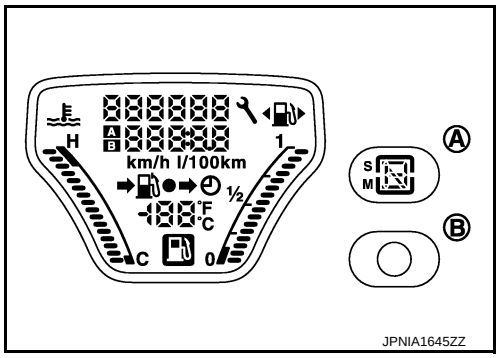
- Segment display operation can be checked in self-diagnosis mode.
- Meters/gauges can be checked in self-diagnosis mode.

OPERATION PROCEDURE

1. Turn ignition switch ON, and switch the trip meter to “trip A” or “trip B”.
   NOTE:
   If the diagnosis function is activated with “trip A” displayed, the mileage on “trip A” is reset to “0000.0”. (The same way for “trip B”.)
2. Turn ignition switch OFF.
3. While pressing the trip reset switch (1), turn ignition switch ON again.

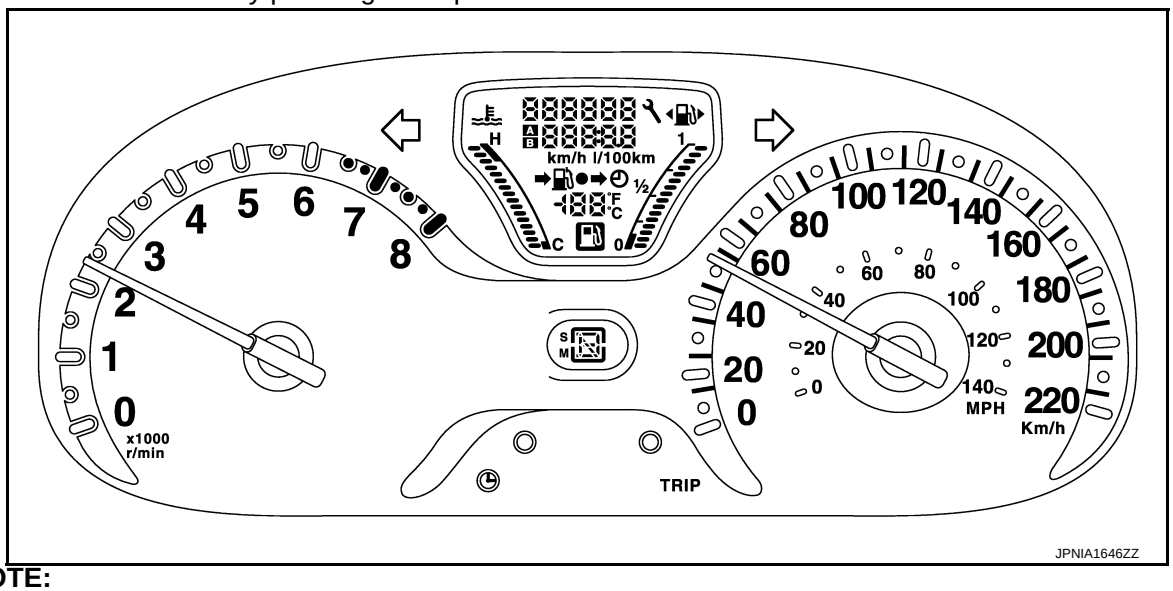


4. Make sure that the trip meter displays “0000.0”.
5. Press the trip reset switch at least 3 times. (Within 7 seconds after the ignition switch is turned ON.)
6. The unified meter control unit is turned to self-diagnosis mode.
   - Speedometer and tachometer return to zero, simultaneously.
   - All of the segments of engine coolant temperature gauge, fuel gauge, odo/trip meter, shift position indicator (A) for A/T models and information display illuminate.
     NOTE:
     For M/T models, start-up lamp (B) illuminate instead of shift position indicator.



NOTE:
- Check combination meter power supply and ground circuit when the self-diagnosis mode of the combination meter does not start. Replace combination meter if power supply and ground circuit are normal.
- If any of the segments are not displayed, replace combination meter.

7. Each meter activates by pressing the trip reset switch.



NOTE:
- If any of the meters or gauges is not activated, replace combination meter.
- The figure is reference.

CONSULT Function (METER/M&A)

INFOID:0000000007769577

CONSULT APPLICATION ITEMS

CONSULT can perform the following diagnosis modes via CAN communication and the combination meter.

System	Diagnosis mode	Description
METER/M&A	Self Diagnostic Result	The combination meter checks the conditions and displays memorized errors.
	Data Monitor	Displays the combination meter input/output data in real time.
	W/L ON History	Lighting history of the warning lamp and indicator lamp can be checked.

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) via CAN communication. **NOTE:** 655.35 is displayed when the malfunction signal is received.
SPEED OUTPUT [km/h]	X	Vehicle speed signal value transmitted to other units via CAN communication. **NOTE:** 655.35 is displayed when the malfunction signal is received.
ODO OUTPUT [km/h or mph]		Odometer signal value transmitted to other units via CAN communication.
TACHO METER [rpm]	X	Value of the engine speed signal received from ECM via CAN communication. **NOTE:** 8191.875 is displayed when the malfunction signal is received.
FUEL METER [L]	X	Fuel level indicated on combination meter.

Display item [Unit]	MAIN SIGNALS	Description
W TEMP METER [°C]	X	Value of engine coolant temperature signal is received from ECM via CAN communication. **NOTE:** 215 is displayed when the malfunction signal is input.
FUEL CAP W/L [On/Off]		Status of fuel filler cap warning display detected from fuel filler cap warning display signal received from ECM via CAN communication.
ABS W/L [On/Off]		Status of ABS warning lamp detected from ABS warning lamp signal is received from ABS actuator and electric unit (control unit) via CAN communication.
VDC/TCS IND [On/Off]		Status of VDC OFF indicator lamp detected from VDC OFF indicator lamp signal is received from ABS actuator and electric unit (control unit) via CAN communication.
SLIP IND [On/Off]		Status of VDC warning lamp detected from VDC warning lamp signal received from ABS actuator and electric unit (control unit) via CAN communication.
BRAKE W/L [On/Off]		Status of brake warning lamp detected from brake warning lamp signal is received from ABS actuator and electric unit (control unit) via CAN communication. **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.
DOOR W/L [On/Off]		Status of door warning detected from door switch signal received from BCM via CAN communication.
HI-BEAM IND [On/Off]		Status of high beam indicator lamp detected from high beam request signal is received from BCM via CAN communication.
TURN IND [On/Off]		Status of turn indicator lamp detected from turn indicator signal is received from BCM via CAN communication.
LIGHT IND [On/Off]		Status of light indicator lamp detected from position light request signal is received from BCM via CAN communication.
OIL W/L [On/Off]		Status of oil pressure warning lamp detected from oil pressure switch signal is received from BCM via CAN communication.
MIL [On/Off]		Status of malfunction indicator lamp detected from malfunctioning indicator lamp signal is received from ECM via CAN communication.
CRUISE IND [On/Off]		Status of CRUISE indicator lamp detected from CRUISE indicator lamp signal is received from ECM via CAN communication.
SPORT IND [On/Off]		Status of OD OFF indicator lamp detected from OD OFF indicator signal is received from TCM via can communication.
FUEL W/L [On/Off]		Low-fuel warning lamp status detected by the identified fuel level.
AIR PRES W/L [On/Off]		Status of low tire pressure warning lamp detected from tire pressure signal is received from BCM via CAN communication.
KEY G/Y W/L [On/Off]		Status of KEY warning lamp (G/Y) detected from KEY warning lamp signal is received from BCM via CAN communication.
KEY KNOB W/L [On/Off]		Status of shift P warning lamp detected from shift P warning lamp signal is received from BCM via CAN communication.
EPS W/L [On/Off]		Status of EPS warning lamp detected from EPS warning lamp signal is received from EPS control unit via CAN communication.
e-4WD W/L [Off]		This item is displayed, but cannot be monitored.
LCD [NIGN B&P, IGN B&P, SFT P, NO KY]		Status of engine start operation indicator lamp, shift P warning lamp and KEY warning lamp, detected from engine start operation indicator lamp signal, shift P warning lamp signal and KEY warning lamp signal are received from BCM via CAN communication.
SHIFT IND [P, R, N, D, L]		Status of shift position, detected from shift position signal received from TCM via CAN communication.
O/D OFF SW [On/Off]		Status of overdrive control switch detected from CVT shift selector.

Display item [Unit]	MAIN SIGNALS	Description
PKB SW [On/Off]		Status of parking brake switch.
BUCKLE SW [On/Off]		Status of seat belt buckle switch (driver side).
BRAKE OIL SW [On/Off]		Status of brake fluid level switch.
A/C AMP CONN [On/Off]		Status of A/C auto amp. connection recognition signal.
DISTANCE [km]		Value of possible driving distance calculated by combination meter.
OUTSIDE TEMP [°C or °F]		Ambient air temperature value converted from ambient sensor signal received from ambient sensor. **NOTE:** This may not match with the temperature value indicated on the information display. (Because the information display value is a corrected value from the ambient sensor input value.)
FUEL LOW SIG [On/Off]		Status of fuel level low warning signal to output to AV control unit via CAN communication.
BUZZER [On/Off]	X	Buzzer status (in the combination meter) is detected from the buzzer output signal received from each unit via CAN communication and the warning output condition of the combination meter.
TPMS PRESS L [On/Off]		Status of low tire pressure warning judged from low tire pressure warning lamp signal received from BCM with CAN communication line.

NOTE:

Some items are not available according to vehicle specification.

W/L ON HISTORY

- Stores histories when warning/indicator lamp is turned on.
- “W/L ON HISTORY” indicates the “TIME” when the warning/indicator lamp is turned on.
- The “TIME” above is:
- 0: The condition that the warning/indicator lamp has been turned on 1 or more times after starting the engine and waiting for 30 seconds.
- 1 - 39: The number of times the engine was restarted after the 0 condition.
- NO W/L ON HISTORY: Stores NO (0) turning on history of warning/indicator lamp.

NOTE:

- W/L ON HISTORY is not stored for approximately 30 seconds after the engine starts.
- Brake warning lamp does not store any history when the parking brake is applied or the brake fluid level gets low.

Display Item

Display item	Description
ABS W/L	Lighting history of ABS warning lamp.
VDC/TCS IND	Lighting history of VDC OFF indicator lamp.
SLIP IND	Lighting history of VDC warning lamp.
BRAKE W/L	Lighting history of brake warning lamp.
DOOR W/L	Lighting history of door warning lamp.
OIL W/L	Lighting history of oil pressure warning lamp.
C-ENG W/L	Lighting history of malfunction indicator lamp.
CRUISE IND	Lighting history of CRUISE indicator lamp.
SPORT IND	Lighting history of OD OFF indicator lamp.
FUEL W/L	Lighting history of low fuel level warning lamp.
WASHER W/L	Lighting history of washer warning lamp.

Display item	Description
AIR PRES W/L	Lighting history of low tire pressure warning lamp.
KEY G/Y W/L	Lighting history of KEY warning lamp (G/Y).
EPS W/L	Lighting history of EPS warning lamp.
CHAGE W/L	Lighting history of charge warning lamp.

NOTE:
In items displayed on the CONSULT screen, only those listed in the above table are used.

DTC/CIRCUIT DIAGNOSIS

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000007769578

CAN (Controller Area Network) is a serial communication system for real time application. It is an on-vehicle multiplex communication system with high data communication speed and excellent error detectability. Many electronic control units are equipped onto vehicles, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with two 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.
CAN Communication Signal Chart. Refer to LAN-22, "CAN Communication Signal Chart".

DTC Logic

INFOID:0000000007769579

DTC DETECTION LOGIC

DTC	Display contents of CONSULT	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:0000000007769580

1.PERFORM SELF DIAGNOSTIC

1. Turn ignition switch ON and wait for 2 seconds or more.
2. Check “Self Diagnostic Result” of “METER/M&A”.

Is “CAN COMM CIRCUIT” displayed?

YES >> Refer to LAN-13, "Trouble Diagnosis Flow Chart".
NO >> Refer to GI-41, "Intermittent Incident".

U1010 CONTROL UNIT (CAN)

Description

INFOID:0000000007769581

Initial diagnosis of combination meter.

DTC Logic

INFOID:0000000007769582

DTC DETECTION LOGIC

DTC	Display contents of CONSULT	Diagnostic item is detected when ...	Probable malfunction location
U1010	CONTROL UNIT (CAN)	If any malfunction is detected during initial diagnosis of combination meter CAN controller	Combination meter

Diagnosis Procedure

INFOID:0000000007769583

1.REPLACE COMBINATION METER

When DTC “U1010” is detected, replace combination meter.

>> INSPECTION END

B2205 VEHICLE SPEED

Description

INFOID:0000000007769584

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

DTC Logic

INFOID:0000000007769585

DTC DETECTION LOGIC

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

Diagnosis Procedure

INFOID:0000000007769586

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 BRC-23, "CONSULT Function".

B2267 ENGINE SPEED

Description

INFOID:0000000007769587

The engine speed signal is transmitted from ECM to the combination meter via CAN communication.

DTC Logic

INFOID:0000000007769588

DTC DETECTION LOGIC

DTC	Display contents of CONSULT	Diagnostic item is detected when ...	Probable malfunction location
B2267	ENGINE SPEED	ECM continuously transmits abnormal engine speed signals for 2 seconds or more	• Crankshaft position sensor (POS) • ECM

Diagnosis Procedure

INFOID:0000000007769589

1.PERFORM SELF-DIAGNOSIS OF ECM

Perform “Self Diagnostic Result” of ECM, and repair or replace malfunctioning parts.

>> Refer to EC-463, "DTC Index" (Except for California) or EC-963, "DTC Index" (For California).

B2268 WATER TEMP

Description

INFOID:0000000007769590

The engine coolant temperature signal is transmitted from ECM to the combination meter via CAN communication.

DTC Logic

INFOID:0000000007769591

DTC DETECTION LOGIC

DTC	Display contents of CONSULT	Diagnostic item is detected when ...	Probable malfunction location
B2268	WATER TEMP	ECM continuously transmits abnormal engine coolant temperature signals for 60 seconds or more	• Engine coolant temperature sensor • ECM

Diagnosis Procedure

INFOID:0000000007769592

1.PERFORM SELF-DIAGNOSIS OF ECM

Perform “Self Diagnosis Result” of ECM, and repair or replace malfunctioning parts.

>> Refer to EC-463, "DTC Index" (Except for California) or EC-963, "DTC Index" (For California).

POWER SUPPLY AND GROUND CIRCUIT
COMBINATION METER

COMBINATION METER : Diagnosis Procedure

INFOID:0000000007769593

1.CHECK FUSE

Check for blown fuses.

Power source	Fuse No.
Battery	11
Ignition switch ACC or ON	20
Ignition switch ON or START	3

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 and ground.

Terminals			Ignition switch position	Voltage (Approx.)
(+)		(–)		
Combination meter				
Connector	Terminal			
M34	27	Ground	OFF	Battery voltage
	15		ACC	
	28		ON	

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 and ground.

Combination meter		Ground	Continuity
Connector	Terminal		
M34	22		Existed
	23		

Is the inspection result normal?

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

IPDM E/R (WITH INTELLIGENT KEY SYSTEM)

IPDM E/R (WITH INTELLIGENT KEY SYSTEM) : Diagnosis Procedure

INFOID:0000000007769594

1.CHECK FUSES AND FUSIBLE LINK

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

Signal name	Fuses and fusible link No.
Battery power supply	C
	D
	J

Is the fuse fusing?

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

2.CHECK POWER SUPPLY CIRCUIT

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

Terminals			Voltage (Approx.)
(+)		(–)	
IPDM E/R			
Connector	Terminal	Ground	
E9	1		Battery voltage
	2		
E10	8		

Is the measurement value normal?

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

3.CHECK GROUND CIRCUIT

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E11	9		Existed
E12	19		

Does continuity exist?

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

IPDM E/R (WITHOUT INTELLIGENT KEY SYSTEM)

IPDM E/R (WITHOUT INTELLIGENT KEY SYSTEM) : Diagnosis Procedure

INFOID:0000000007769595

1.CHECK FUSES AND FUSIBLE LINK

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

Signal name	Fuses and fusible link No.
Battery power supply	C
	D
	J

Is the fuse fusing?

YES >> Replace the blown fuse or fusible link after repairing the affected circuit if a fuse or fusible link is blown.

NO >> GO TO 2.

2.CHECK POWER SUPPLY CIRCUIT

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

Terminals			Voltage (Approx.)
(+)		(–)	
IPDM E/R			
Connector	Terminal	Ground	
E9	1		Battery voltage
	2		
E10	8		

Is the measurement value normal?

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

3.CHECK IGNITION POWER SUPPLY CIRCUIT

1. Turn the ignition switch ON.
2. Check voltage between IPDM E/R harness connector and the ground.

Terminals			Voltage (Approx.)
(+)		(–)	
IPDM E/R		Ground	
Connector	Terminal		
E12	18		Battery voltage

Is the measurement value normal?

YES >> GO TO 4.
NO >> Repair the harness or connector.

4.CHECK GROUND CIRCUIT

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E11	9		Existed
E12	19		

Does continuity exist?

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

FUEL LEVEL SENSOR SIGNAL CIRCUIT

Description

INFOID:0000000007769596

The fuel level sensor unit and fuel pump detect the fuel level in the fuel tank and transmit the fuel level sensor signal to the combination meter.

Component Function Check

INFOID:0000000007769597

1.CHECK COMBINATION METER OUTPUT 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	Reference value of data monitor [L]
Full (16/16)	Approx. 48.0
Three quarters (12/16)	Approx. 36.8
Half (8/16)	Approx. 25.6
A quarter (4/16)	Approx. 14.4
Empty (0/16)	Approx. 3.2

Does monitor value match fuel gauge reading?

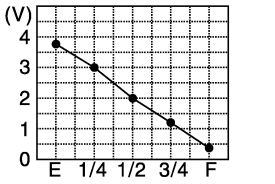
YES >> INSPECTION END
NO >> Replace combination meter. Refer to MWI-90, "Removal and Installation".

Diagnosis Procedure

INFOID:0000000007769598

1.CHECK COMBINATION METER INPUT SIGNAL

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

Terminals			Voltage (Pyrex.)
(+)		(–)	
Combination meter			
Connector	Terminal		
M34	6	Ground	

JPNIA1546ZZ

Does it match fuel gauge reading?

YES >> GO TO 2.
NO >> Replace the combination meter. Refer to MWI-90, "Removal and Installation".

2.CHECK FUEL LEVEL SENSOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and fuel level sensor unit connector.
3. Check continuity between combination meter harness connector and fuel level sensor unit harness connector.

Combination meter		Fuel level sensor unit		Continuity
Connector	Terminal	Connector	Terminal	
M34	6	B40	2	Existed

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

Combination meter		Ground	Continuity
Connector	Terminal		
M34	6		Not existed

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 harness connector and combination meter harness connector.

Fuel level sensor unit		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
B40	5	M34	24	Existed

Is the inspection result normal?

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

Component Inspection

INFOID:0000000007769599

1.REMOVE FUEL LEVEL SENSOR UNIT

Remove the fuel level sensor unit. Refer to FL-5, "Removal and Installation".

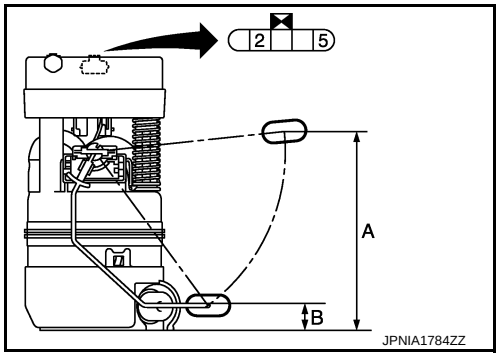
>> GO TO 2.

2.CHECK FUEL LEVEL SENSOR UNIT

Check the resistance between fuel level sensor unit and fuel pump.

Terminals		Condition	Resistance (Ω) (Approx.)	Height [mm (in)]
Fuel level sensor unit				
2	5	Full* (A)	5.0	165.7 (6.5)
		Empty* (B)	81.5	21.1 (0.83)

*: When float rod is contact with stopper.



Is inspection result OK?

YES >> INSPECTION END
NO >> Replace fuel level sensor unit and fuel pump. Refer to FL-5, "Removal and Installation".

OIL PRESSURE SWITCH SIGNAL CIRCUIT

Description

INFOID:0000000007769600

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

Component Function Check

INFOID:0000000007769601

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:0000000007769602

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 and oil pressure switch harness connector.

Terminals				Continuity
(+)		(–)		
IPDM E/R		Oil pressure switch		
Connector	Terminal	Connector	Terminal	
E13	24	F63	1	Existed

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

Terminals			Continuity
(+)		(–)	
IPDM E/R		Ground	
Connector	Terminal		
E13	24		Not existed

Is the inspection result normal?

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

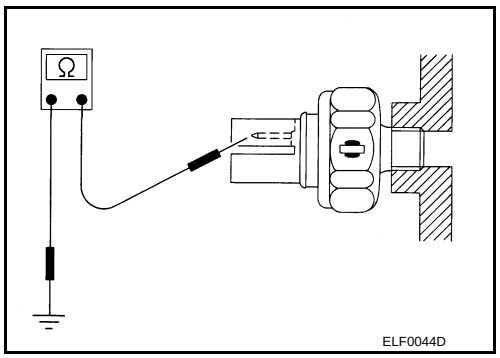
Component Inspection

INFOID:0000000007769603

1.CHECK OIL PRESSURE SWITCH

Check continuity between oil pressure switch and ground.

Condition	Continuity
Engine stopped	Existed
Engine running	Not existed



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace oil pressure switch. Refer to EM-88, "Exploded View".

WASHER LEVEL SWITCH SIGNAL CIRCUIT

Description

INFOID:0000000007769604

Transmits the washer level switch signal to the combination meter.

Diagnosis Procedure

INFOID:0000000007769605

1.CHECK WASHER LEVEL SWITCH SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and washer level switch connector.
3. Check continuity between combination meter harness connector and washer level switch harness connector.

Terminals				Continuity
Combination meter		Washer level switch		
Connector	Terminal	Connector	Terminal	
M34	17	E52	1	Existed

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

Terminals			Continuity
Combination meter		Ground	
Connector	Terminal		
M34	17		Not existed

Is the inspection result normal?

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

2.CHECK WASHER LEVEL SWITCH GROUND CIRCUIT

Check continuity between washer level switch connector and ground.

Terminals			Continuity
Washer level switch		Ground	
Connector	Terminal		
E52	2		Existed

Is the inspection result normal?

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

Component Inspection

INFOID:0000000007769606

1.CHECK WASHER LEVEL SWITCH

1. Turn ignition switch OFF.
2. Disconnect washer level switch connector.
3. Check washer level switch.

Terminals		Condition	Continuity
Washer level switch			
1	2	Washer level switch ON	Existed
		Washer level switch OFF	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace washer level switch. Refer to WW-121, "Removal and Installation".

A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL CIRCUIT

Description

INFOID:0000000007769607

A/C auto amp. transmits the A/C auto amp. connection recognition signal to the combination meter.

Diagnosis Procedure

INFOID:0000000007769608

1.CHECK A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL

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

Terminals			Voltage (Pyrex.)
(+)		(–)	
Combination meter		Ground	
Connector	Terminal		
M34	31		5 V

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 2.

2.CHECK A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector and A/C auto amp. connector.
3. Check continuity between combination meter harness connector and A/C auto amp. harness connector.

Combination meter		A/C auto amp.		Continuity
Connector	Terminal	Connector	terminal	
M34	31	M50	2	Existed

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

Combination meter		Ground	Continuity
Connector	Terminal		
M34	31		Not existed

Is the inspection result normal?

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

ECU DIAGNOSIS INFORMATION

COMBINATION METER

Reference Value

INFOID:0000000007769609

VALUES ON THE DIAGNOSIS TOOL

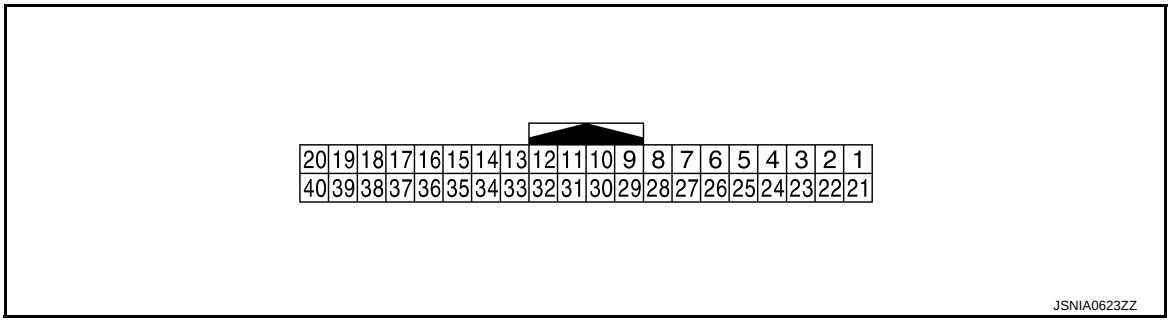
Monitor Item	Condition		Value/Status
SPEED METER [km/h]	Ignition switch ON	While driving	Equivalent to speedometer reading **NOTE:** 655.35 is displayed when the malfunction signal is received
SPEED OUTPUT [km/h]	Ignition switch ON	While driving	Equivalent to speedometer reading **NOTE:** 655.35 is displayed when the malfunction signal is received
ODO OUTPUT [km/h or mph]	Ignition switch ON	—	Equivalent to odometer reading in combination meter
TACHO METER [rpm]	Ignition switch ON	Engine running	Equivalent to tachometer reading **NOTE:** 8191.875 is displayed when the malfunction signal is received
FUEL METER [L]	Ignition switch ON	—	Values according to fuel level
W TEMP METER [°C]	Ignition switch ON	—	Values according to engine coolant temperature **NOTE:** 215 is displayed when the malfunction signal is input
FUEL CAP W/L	Ignition switch ON	Fuel filler cap warning display ON	On
		Fuel filler cap warning display OFF	Off
ABS W/L	Ignition switch ON	ABS warning lamp ON	On
		ABS warning lamp OFF	Off
VDC/TCS IND	Ignition switch ON	VDC OFF indicator lamp ON	On
		VDC OFF indicator lamp OFF	Off
SLIP IND	Ignition switch ON	VDC warning lamp ON	On
		VDC warning lamp OFF	Off
BRAKE W/L	Ignition switch ON	Brake warning lamp ON	On
		Brake warning 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
LIGHT IND	Ignition switch ON	Tail lamp indicator lamp ON	On
		Tail lamp indicator lamp OFF	Off
OIL W/L	Ignition switch ON	Oil pressure warning lamp ON	On
		Oil pressure warning lamp OFF	Off
MIL	Ignition switch ON	Malfunction indicator lamp ON	On
		Malfunction indicator lamp OFF	Off

Monitor Item	Condition		Value/Status
CRUISE IND	Ignition switch ON	CRUISE indicator lamp ON	On
		CRUISE indicator lamp OFF	Off
SPORT IND	Ignition switch ON	OD OFF indicator lamp ON	On
		OD OFF indicator lamp OFF	Off
FUEL W/L	Ignition switch ON	Low-fuel warning displayed	On
		Low-fuel warning not displayed	Off
AIR PRES W/L	Ignition switch ON	Low tire pressure lamp ON	On
		Low tire pressure lamp OFF	Off
KEY G/Y W/L	Ignition switch ON	KEY warning lamp (G/Y) ON	On
		KEY warning lamp (G/Y) OFF	Off
KEY KNOB W/L	Ignition switch ON	Shift P warning lamp ON	On
		Shift P warning lamp OFF	Off
EPS W/L	Ignition switch ON	EPS warning lamp ON	On
		EPS warning lamp OFF	Off
e-4WD W/L	Ignition switch ON	**NOTE:** This item is displayed, but cannot be monitored.	Off
LCD	Ignition switch LOCK or ACC	Engine start operation indicator lamp ON	NIGN B&P
	Ignition switch ON	Engine start operation indicator lamp ON	IGN B&P
	Ignition switch LOCK	Shift P warning lamp ON	SFT P
	Ignition switch ON	KEY warning lamp blinking	NO KY
SHIFT IND	Ignition switch ON	Shift position indicator P display	P
		Shift position indicator R display	R
		Shift position indicator N display	N
		Shift position indicator D display	D
		Shift position indicator L display	L
O/D OFF SW	Ignition switch ON	Overdrive control switch ON	On
		Overdrive control switch OFF	Off
PKB SW	Ignition switch ON	Parking brake switch ON	On
		Parking brake switch OFF	Off
BUCKLE SW	Ignition switch ON	Seat belt (driver side) not fastened	On
		Seat belt (driver side) fastened	Off
BRAKE OIL SW	Ignition switch ON	Brake fluid level switch ON	On
		Brake fluid level switch OFF	Off
A/C AMP CONN	Ignition switch ON	Other than the following	On
		Receives A/C auto amp. connection recognition signal	Off
DISTANCE [km]	Ignition switch ON	—	Possible driving distance calculated by combination meter
OUTSIDE TEMP [°C or °F]	Ignition switch ON	—	Equivalent to ambient temperature **NOTE:** This may not match the indicated value on the information display.

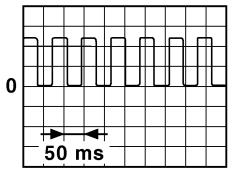
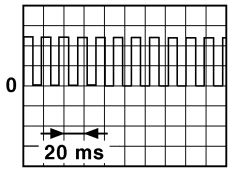
Monitor Item	Condition		Value/Status
FUEL LOW SIG	Ignition switch ON	Low fuel warning displayed	On
		Low fuel warning not displayed	Off
BUZZER	Ignition switch ON	Buzzer ON	On
		Buzzer OFF	Off
TPMS PRESS L	Ignition switch ON	Low tire pressure warning display ON	On
		Low tire pressure warning display OFF	Off

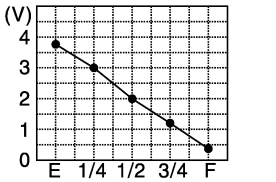
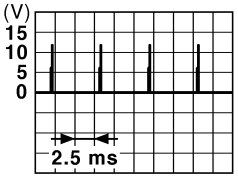
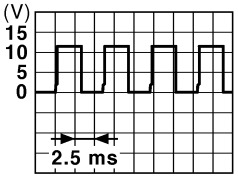
NOTE:
Some items are not available according to vehicle specification.

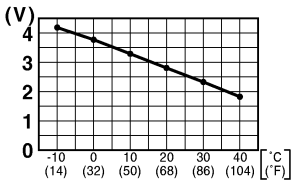
TERMINAL LAYOUT

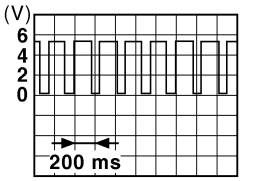
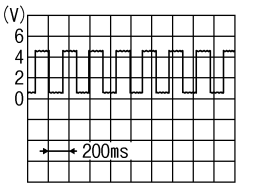


PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
1 (L)	—	CAN-H	—	—	—	—
2 (P)	—	CAN-L	—	—	—	—
3 (V)	Ground	Vehicle speed signal (2-pulse)	Output	Ignition switch ON	Speedometer operated [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** The maximum voltage varies depending on the specification (destination unit).  JSNIA0015GB
4 (V/R)*1 (L)*2	Ground	Vehicle speed signal (8-pulse)	Output	Ignition switch ON	Speedometer operated [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** The maximum voltage varies depending on the specification (destination unit).  JSNIA0012GB

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
6 (BR/Y)	Ground	Fuel level sensor signal	Input	Ignition switch ON	—	 JPNIA1546ZZ
7 (R/G)	Ground	Air bag signal	Input	Ignition switch ON	Air bag warning lamp ON	5 V
					Air bag warning lamp OFF	0 V
8 (P)	Ground	Overdrive control switch signal	Input	Ignition switch ON	Overdrive control switch ON	4 V
					Overdrive control switch OFF	0 V
9 (O)	Ground	Seat belt buckle switch signal (driver side)	Input	Ignition switch ON	When driver seat belt is fastened.	12 V
					When driver seat belt is unfastened.	0 V
10 (SB)	Ground	Parking brake switch signal	Input	Engine idling	Parking brake applied.	0 V
					Parking brake released.	5 V
11 (G/R)	Ground	Brake fluid level switch signal	Input	Ignition switch ON	Brake fluid level is normal	12 V
					Brake fluid level is less than LOW level	0 V
13 (B/R)	Ground	Illumination control signal	Output	Ignition switch ON	• Lighting switch 1ST • When meter illumination is maximum	 JPNIA1687GB
					• Lighting switch 1ST • When meter illumination is step 11	 JPNIA1686GB
					• Lighting switch 1ST • When meter illumination is minimum	12 V
15 (L/Y)	Ground	ACC power supply	Input	Ignition switch ACC	—	Battery voltage
17 (G)	Ground	Washer level switch signal	Input	Ignition switch ON	Low washer fluid warning lamp ON	0 V
					Low washer fluid warning lamp OFF	12 V

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
18 (R/Y)	Ground	Security signal	Input	Ignition switch ON	Security warning lamp ON	0 V
					Security warning lamp OFF	12 V
19 (PU/W)	Ground	Ambient sensor signal	Input	Ignition switch ON	Changes depending to ambient temperature.	 JSNIA0014GB
20 (R/W)	Ground	Ambient sensor ground	—	Ignition switch ON	—	0 V
21 (B)	Ground	Ground	—	Ignition switch ON	—	0 V
22 (B)	Ground	Ground	—	Ignition switch ON	—	0 V
23 (B)	Ground	Ground	—	Ignition switch ON	—	0 V
24 (PU)	Ground	Fuel level sensor signal ground	—	Ignition switch ON	—	0 V
25 (B)	Ground	VDC ground	—	Ignition switch ON	—	0 V
27 (LG)	Ground	Battery power supply	Input	Ignition switch OFF	—	Battery voltage
28 (GR)	Ground	Ignition signal	Input	Ignition switch ON	—	Battery voltage
29 (BR)	Ground	Passenger seat belt warning signal	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 unfastened.	0 V
31 (R)	Ground	A/C auto amp. connection recognition signal	Input	Ignition switch ON	—	5 V

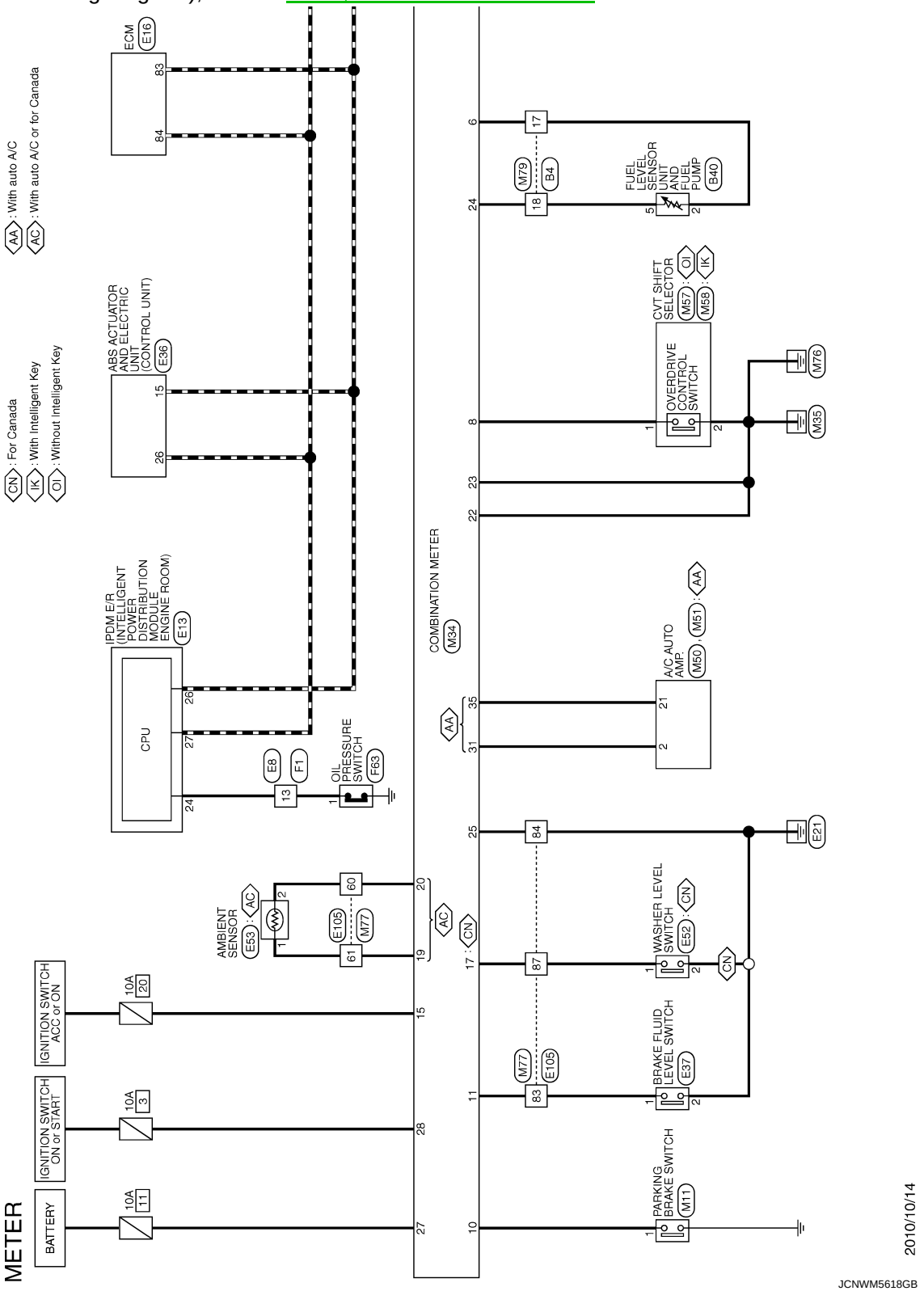
Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
35 (BR)	Ground	Engine coolant temperature signal	Output	Ignition switch ON	Engine idling [Approximately 20°C (68°F)]	 PKID0590E
					Engine idling [Approximately 80°C (176°F)]	0 V  SKIB3651J
38 (GR)	Ground	Alternator signal	Input	Ignition switch ON	Charge warning lamp ON	0 V
					Charge warning lamp OFF	12 V

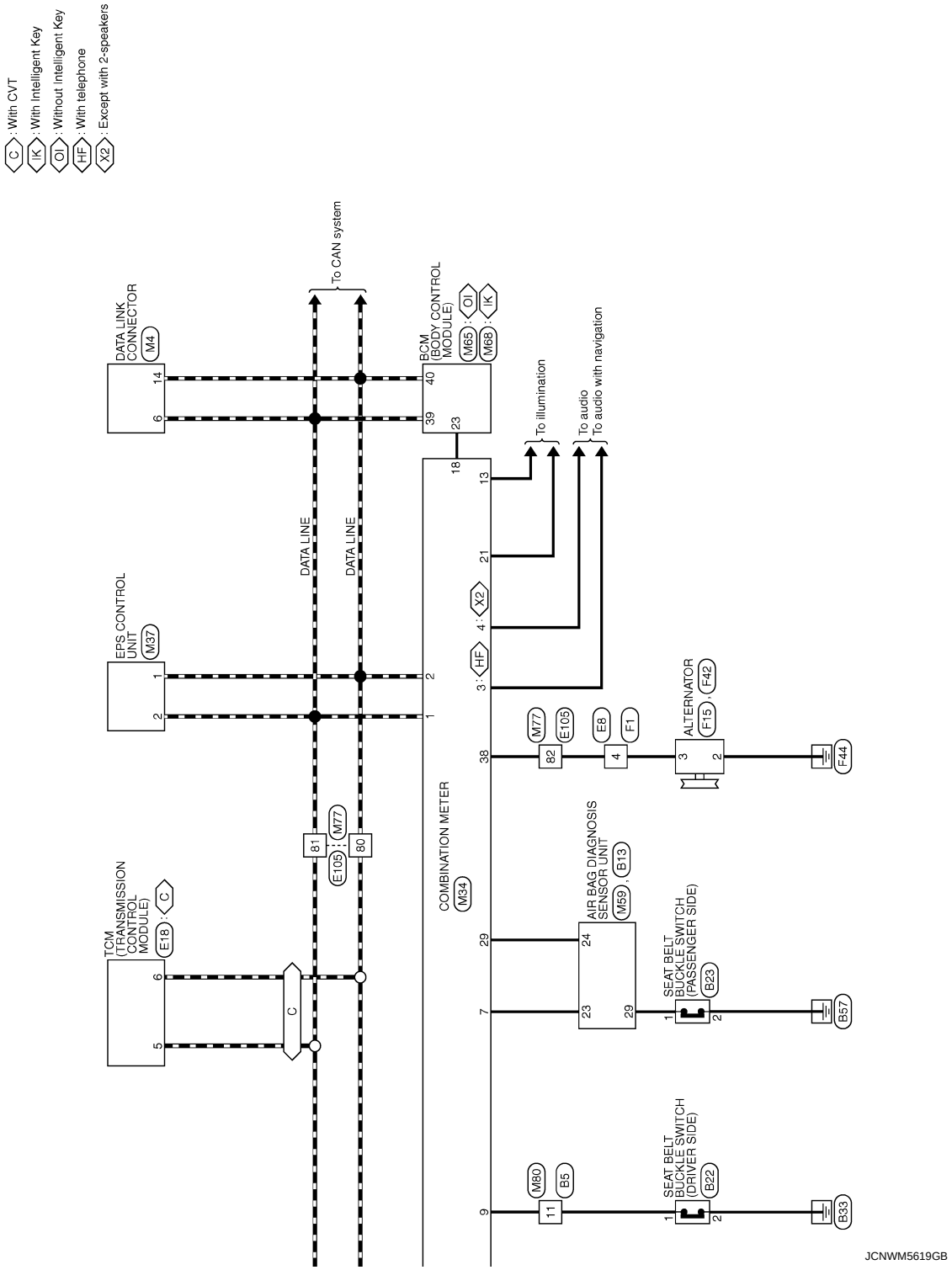
- *1: With NAVI
- *2: Without NAVI

Wiring Diagram - METER -

INFOID:0000000007769610

For connector terminal arrangements, harness layouts, and alphabets in a ⬡ (option abbreviation; if not described in wiring diagram), refer to GI-12, "Connector Information".





Fail-Safe

INFOID:0000000007769611

FAIL-SAFE

The combination meter activates the fail-safe control if CAN communication with each unit is malfunctioning.

Function		Specifications
Speedometer		Reset to zero by suspending communication.
Tachometer		
Engine coolant temperature gauge		
Illumination control		When suspending communication, changes to nighttime mode.
Shift position indicator		The indicator turns OFF by suspending communication.
Information display	Instantaneous fuel warning	• When reception time of an abnormal signal is 2 seconds or less, the last received datum is used for calculation to indicate the result. • When reception time of an abnormal signal is more than two seconds, the last result calculated during normal condition is indicated.
	Average fuel consumption	
	Possible driving distance	
	Average vehicle speed	
	Low tire pressure warning	The display turns OFF by suspending communication.
Buzzer		The buzzer turns off by suspending communication.
Warning lamp/indicator lamp	ABS warning lamp	The lamp turns ON by suspending communication.
	VDC warning lamp	
	EPS warning lamp	
	Brake warning lamp	
	Malfunction indicator lamp	
	Low tire pressure warning lamp	The lamp turns ON after flashing for 1 minute.
	VDC OFF indicator lamp	The lamp turns OFF by suspending communication.
	High beam indicator lamp	
	Turn signal indicator lamp	
	Door warning lamp	
	Light indicator lamp	
	Engine start operation indicator lamp	
	Shift P warning lamp	
	Oil pressure warning lamp	
	CRUISE indicator lamp	
	O/D OFF indicator lamp	
	Low washer fluid warning lamp	
	Key warning lamp	

DTC Index

INFOID:0000000007769612

Display contents of CONSULT	Diagnostic item is detected when ...	Refer to
CAN COMM CIRCUIT [U1000]	When combination meter is not transmitting or receiving CAN communication signal for 2 seconds or more.	MWI-34, "Diagnosis Procedure"
CONTROL UNIT (CAN) [U1010]	When detecting error during the initial diagnosis of the CAN controller of combination meter.	MWI-35, "Diagnosis Procedure"
VEHICLE SPEED [B2205]	The abnormal vehicle speed signal is input from the ABS actuator and electric unit (control unit) for 2 seconds or more.	MWI-36, "Diagnosis Procedure"

Display contents of CONSULT	Diagnostic item is detected when ...	Refer to
ENGINE SPEED [B2267]	If ECM continuously transmits abnormal engine speed signals for 2 seconds or more.	MWI-37, "Diagnosis Procedure"
WATER TEMP [B2268]	If ECM continuously transmits abnormal engine coolant temperature signals for 60 seconds or more.	MWI-38, "Diagnosis Procedure"

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

WITH INTELLIGENT KEY

WITH INTELLIGENT KEY : Reference Value

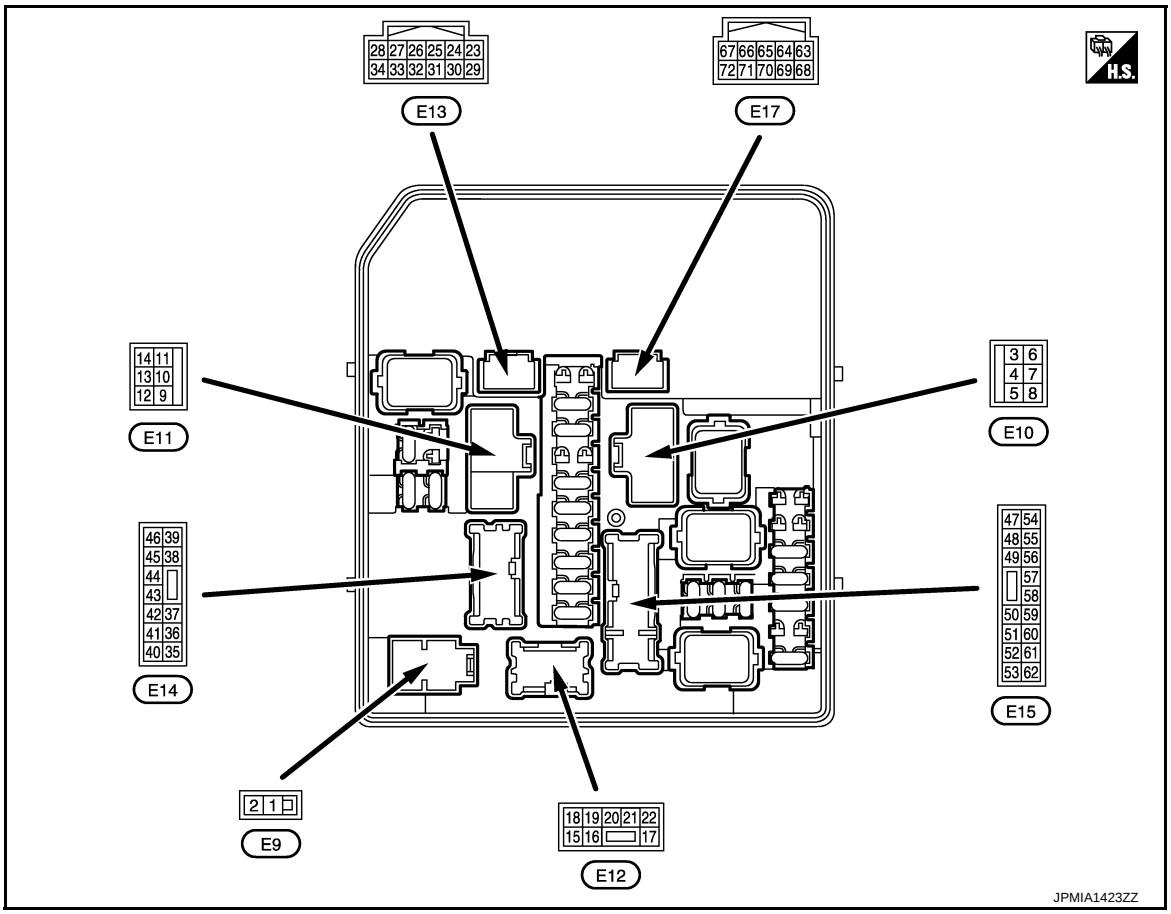
INFOID:0000000007970529

VALUES ON THE DIAGNOSIS TOOL

Monitor Item	Condition		Value/Status
MOTOR FAN REQ	Engine idle speed	Changes depending on engine coolant temperature, air conditioner operation status, vehicle speed, etc.	1/2/3/4
AC COMP REQ	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, HI or AUTO (Light is illuminated)		On
HL LO REQ	Lighting switch OFF		Off
	Lighting switch 2ND, HI or AUTO (Light is illuminated)		On
HL HI REQ	Lighting switch OFF		Off
	Lighting switch HI		On
FR FOG REQ	Lighting switch 2ND or AUTO (Light is illuminated)	Front fog lamp switch OFF	Off
		Front fog lamp switch ON	On
FR WIP REQ	Ignition switch ON	Front wiper switch OFF	Stop
		Front wiper switch INT	1LOW
		Front wiper switch LO	Low
		Front wiper switch HI	Hi
WIP AUTO STOP	Ignition switch ON	Front wiper stop position	STOP P
		Any position other than front wiper stop position	ACT P
WIP PROT	Ignition switch ON	Front wiper operates normally	Off
		Front wiper stops at fail-safe operation	BLOCK
IGN RLY1 -REQ	Ignition switch OFF or ACC		Off
	Ignition switch ON		On
IGN RLY	Ignition switch OFF or ACC		Off
	Ignition switch ON		On
PUSH SW	Release the push-button ignition switch		Off
	Press the push-button ignition switch		On
INTER/NP SW	Ignition switch ON	• Selector lever in any position other than P or N (CVT models) • Release clutch pedal (M/T models)	Off
		• Selector lever in P or N position (CVT models) • Depress clutch pedal (M/T models)	On
ST RLY CONT	Ignition switch ON		Off
	At engine cranking		On

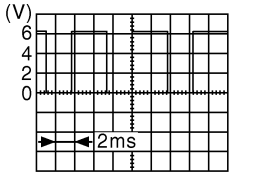
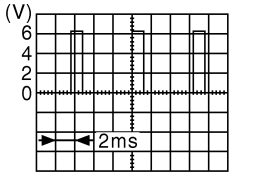
Monitor Item	Condition		Value/Status
IHBT RLY -REQ	Ignition switch ON		Off
	At engine cranking		On
ST/INHI RLY	Ignition switch ON		Off
	At engine cranking		INHI ON → ST ON
	The status of starter relay or starter control relay cannot be recognized by the battery voltage malfunction, etc. when the starter relay is ON and the starter control relay is OFF		UNKWN
DETENT SW	Ignition switch ON	• Pull the selector lever with selector lever in P position • Selector lever in any position other than P	Off
	Release the selector lever with selector lever in P position **NOTE:** Fixed On for M/T models		On
S/L RLY -REQ	**NOTE:** The item is indicated, but not monitored.		Off
S/L STATE	**NOTE:** The item is indicated, but not monitored.		UNLOCK
DTRL REQ **NOTE:** This item is monitored only on the vehicle with the daytime running light system.	Not operation		Off
	Daytime running light system is operated.		On
OIL P SW	Ignition switch OFF, ACC or engine running		Open
	Ignition switch ON		Close
HOOD SW	**NOTE:** The item is indicated, but not monitored.		Off
THFT HRN REQ	Not operation		Off
	• Panic alarm is activated • Horn is activated with VEHICLE SECURITY (THEFT WARNING) SYSTEM		On
HORN CHIRP	Not operating		Off
	Door locking with Intelligent Key (horn chirp mode)		On

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal NO. (Wire color)		Description		Condition	Value (Approx.)
		Signal name	Input/ Output		
+	–				
1 (R)	Ground	Battery power supply	Input	Ignition switch OFF	Battery voltage
2 (G)	Ground	Battery power supply	Input	Ignition switch OFF	Battery voltage
3 (BR)	Ground	Starter motor	Output	Ignition switch ON	0 V
				At engine cranking	Battery voltage
4 (P)	Ground	Battery power supply	Input	Ignition switch OFF	Battery voltage
5 (LG)	Ground	Cooling fan relay-1 power supply	Output	Cooling fan OFF	0 V
				Cooling fan operated	Battery voltage
7 (Y)	Ground	Cooling fan relay-2 power supply	Output	Cooling fan OFF	0 V
				Cooling fan LO operated	9.0 V
				Cooling fan HI operated	Battery voltage
8 (V)	Ground	Battery power supply	Input	Ignition switch OFF	Battery voltage
9 (B/W)	Ground	Ground	—	Ignition switch ON	0 V
10 (L)	Ground	Cooling fan motor ground	Output	Cooling fan OFF	0 V
				Cooling fan LO operated	5.0 V
				Cooling fan HI operated	0 V

Terminal NO. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
13 (W)	Ground	Rear window defogger	Output	Ignition switch ON	Rear window defogger switch OFF	0 V
					Rear window defogger switch ON	Battery voltage
19 (B/W)	Ground	Ground	—	Ignition switch ON		0 V
21 (W)	Ground	Front fog lamp (RH)	Output	Lighting switch 2ND	Front fog lamp switch OFF	0 V
					Front fog lamp switch ON	Battery voltage
22 (V)	Ground	Front fog lamp (LH)	Output	Lighting switch 2ND	Front fog lamp switch OFF	0 V
					Front fog lamp switch ON	Battery voltage
24 (LG)	Ground	Oil pressure switch	Input	Ignition switch ON	Engine stopped	0 V
					Engine running	Battery voltage
25 (Y)	Ground	Front wiper auto stop	Input	Ignition switch ON	Front wiper stop position	0 V
					Any position other than front wiper stop position	Battery voltage
26 (P)	Ground	CAN-L	Input/ Output	—		—
27 (L)	Ground	CAN-H	Input/ Output	—		—
28*1 (P)	Ground	Daytime running light relay-1 control	Output	Daytime running light deactivated		0 V
				Daytime running light activated		Battery voltage
30 (SB)	Ground	Starter relay control	Output	At engine cranking		0 V
				Ignition switch ON		Battery voltage
31 (W)	Ground	Fuel pump relay control	Output	• Approximately 1 second after turning the ignition switch ON • Engine running		0 - 1.5 V
				Approximately 1 second or more after turning the ignition switch ON		Battery voltage
33 (O)	Ground	Power generation command signal	Output	Ignition switch ON		Battery voltage
				40 % is set on “ACTIVE TEST”, “ALTERNATOR DUTY” of “ENGINE”		 JPMIA0002GB 3.8 V
				80 % is set on “ACTIVE TEST”, “ALTERNATOR DUTY” of “ENGINE”		 JPMIA0003GB 1.4 V

Terminal NO. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
34 (R)	Ground	Horn relay control	Output	The horn is deactivated		Battery voltage
				The horn is activated		0 V
36 (Y)	Ground	Parking lamp (LH)	Output	Ignition switch ON	Lighting switch OFF	0 V
					Lighting switch 1ST	Battery voltage
37 (V)	Ground	Parking lamp (RH)	Output	Ignition switch ON	Lighting switch OFF	0 V
					Lighting switch 1ST	Battery voltage
38 (G)	Ground	Tail lamp (RH) & illuminations	Output	Ignition switch ON	Lighting switch OFF	0 V
					Lighting switch 1ST	Battery voltage
39 (V)	Ground	Front wiper HI	Output	Ignition switch ON	Front wiper switch OFF	0 V
					Front wiper switch HI	Battery voltage
40 (R)	Ground	ECM relay control	Output	Ignition switch OFF (More than a few seconds after turning ignition switch OFF)		Battery voltage
				• Ignition switch ON • Ignition switch OFF (For a few seconds after turning ignition switch OFF)		0 - 1.5 V
41 (SB)	Ground	Tail lamp (LH) & license plate lamps	Output	Ignition switch ON	Lighting switch OFF	0 V
					Lighting switch 1ST	Battery voltage
43 (G)	Ground	ECM relay power supply	Output	Ignition switch OFF (More than a few seconds after turning ignition switch OFF)		0 V
				• Ignition switch ON • Ignition switch OFF (For a few seconds after turning ignition switch OFF)		Battery voltage
44 (P)	Ground	ECM relay power supply	Output	Ignition switch OFF (More than a few seconds after turning ignition switch OFF)		0 V
				• Ignition switch ON • Ignition switch OFF (For a few seconds after turning ignition switch OFF)		Battery voltage
45 (Y)	Ground	TCM power supply	Output	Ignition switch OFF		Battery voltage
46 (O)	Ground	Front wiper LO	Output	Ignition switch ON	Front wiper switch OFF	0 V
					Front wiper switch LO	Battery voltage
47 (BR)	Ground	Transmission range switch[*2]	Input	Select lever in any position other than P or N (Ignition switch ON)		0 V
				Select lever P or N (Ignition switch ON)		Battery voltage
		Clutch interlock switch[*3]		Release the clutch pedal		0 V
				Depress the clutch pedal		Battery voltage

Terminal NO. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
49 (W)	Ground	Headlamp HI (RH)	Output	Ignition switch ON	Lighting switch OFF	0 V
					• Lighting switch HI • Lighting switch PASS	Battery voltage
				Daytime running light activated[*1]		7.0 V
50 (GR)	Ground	Headlamp HI (LH)	Output	Ignition switch ON	Lighting switch OFF	0 V
					• Lighting switch HI • Lighting switch PASS	Battery voltage
				Daytime running light activated[*1]		7.0 V
51 (R)	Ground	Headlamp LO (LH)	Output	Ignition switch ON	Lighting switch OFF	0 V
					Lighting switch 2ND	Battery voltage
52 (P)	Ground	Headlamp LO (RH)	Output	Ignition switch ON	Lighting switch OFF	0 V
		Daytime running light relay-2[*1]			Lighting switch 2ND	Battery voltage
54 (GR)	Ground	Throttle control motor relay power supply	Output	Ignition switch OFF (More than a few seconds after turning ignition switch OFF)		0 V
				• Ignition switch ON • Ignition switch OFF (For a few seconds after turning ignition switch OFF)		Battery voltage
55 (P)	Ground	Fuel pump power supply	Output	Approximately 1 second or more than after turning the ignition switch ON		0 V
				• Approximately 1 second after turning the ignition switch ON • Engine running		Battery voltage
56 (SB)	Ground	A/C relay power supply	Output	Engine running	A/C switch OFF	0 V
					A/C switch ON (A/C compressor is operating)	Battery voltage
57 (G)	Ground	Throttle control motor relay control	Output	Ignition switch ON → OFF		0 - 1.0 V ↓ Battery voltage ↓ 0 V
				Ignition switch ON		0 - 1.0 V
58 (R)[*2] (Y)[*3]	Ground	Ignition relay power supply	Output	Ignition switch OFF		0 V
				Ignition switch ON		Battery voltage
59 (Y)	Ground	Ignition relay power supply	Output	Ignition switch OFF		0 V
				Ignition switch ON		Battery voltage
60 (V)	Ground	Ignition relay power supply	Output	Ignition switch OFF		0 V
				Ignition switch ON		Battery voltage
61 (W)	Ground	Ignition relay power supply	Output	Ignition switch OFF		0 V
				Ignition switch ON		Battery voltage
62 (L)	Ground	Ignition relay power supply	Output	Ignition switch OFF		0 V
				Ignition switch ON		Battery voltage

Terminal NO. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
64*2 (R)	Ground	CVT shift selector (Detention switch)	Input	Ignition switch ON	Select lever P	0 V
					Select lever in any position other than P	Battery voltage
66 (L)	Ground	Push-button ignition switch	Input	Press the push-button ignition switch		0 V
				Release the push-button ignition switch		Battery voltage
69 (Y)	Ground	Ignition relay monitor	Input	Ignition switch OFF or ACC		Battery voltage
				Ignition switch ON		0 V

*1: With daytime running light system

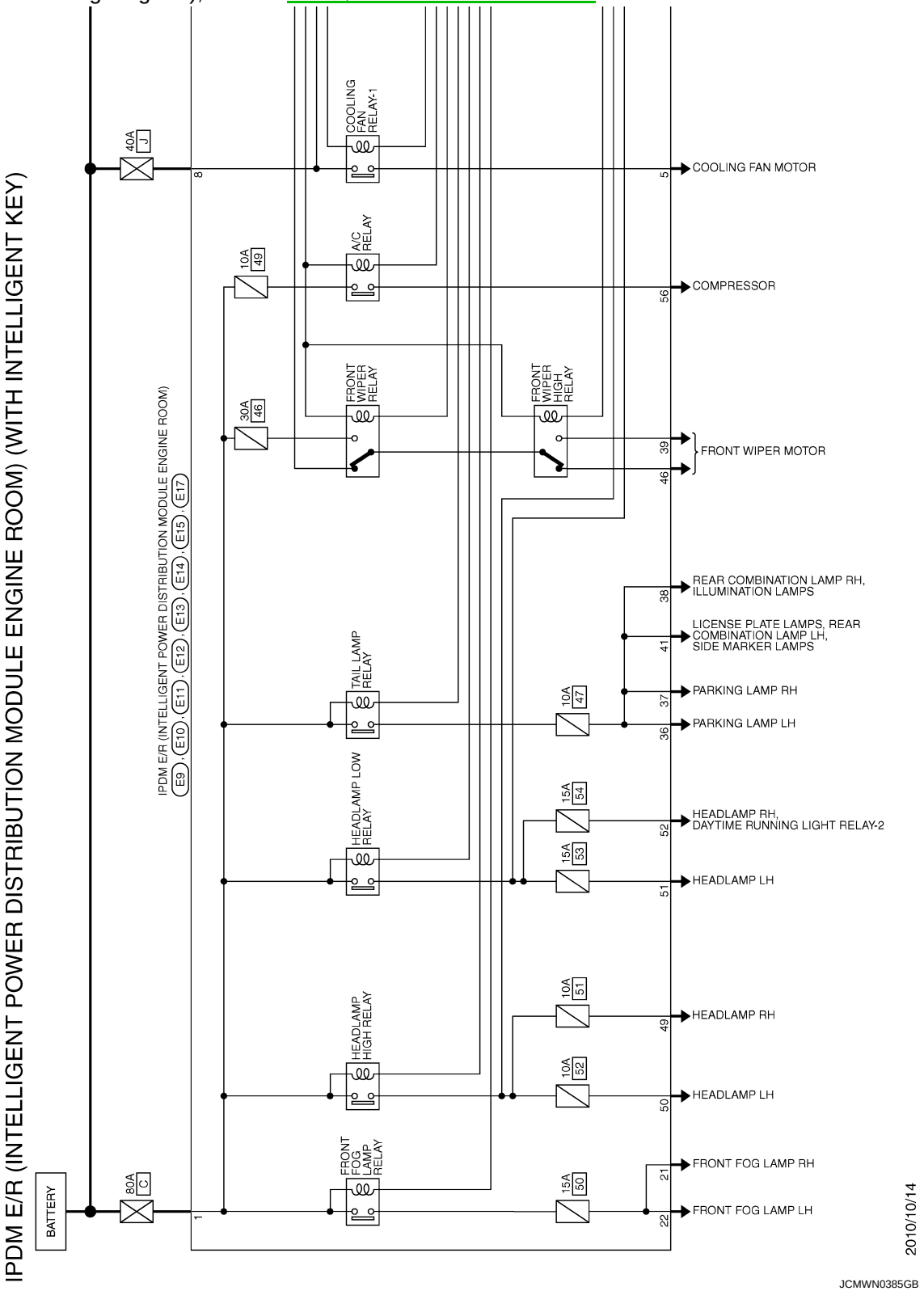
*2: CVT models

*3: M/T models

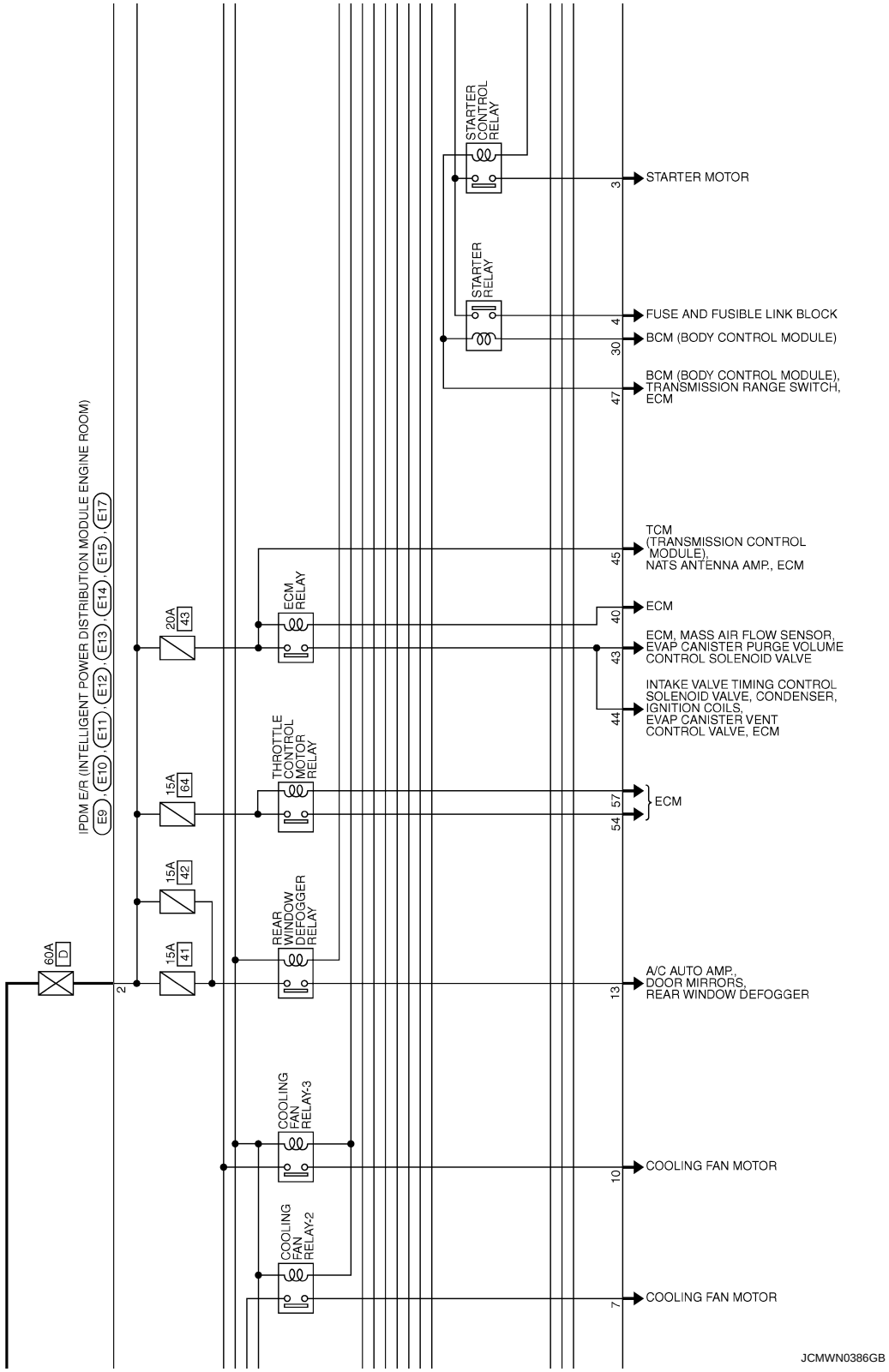
WITH INTELLIGENT KEY : Wiring Diagram — IPDM E/R —

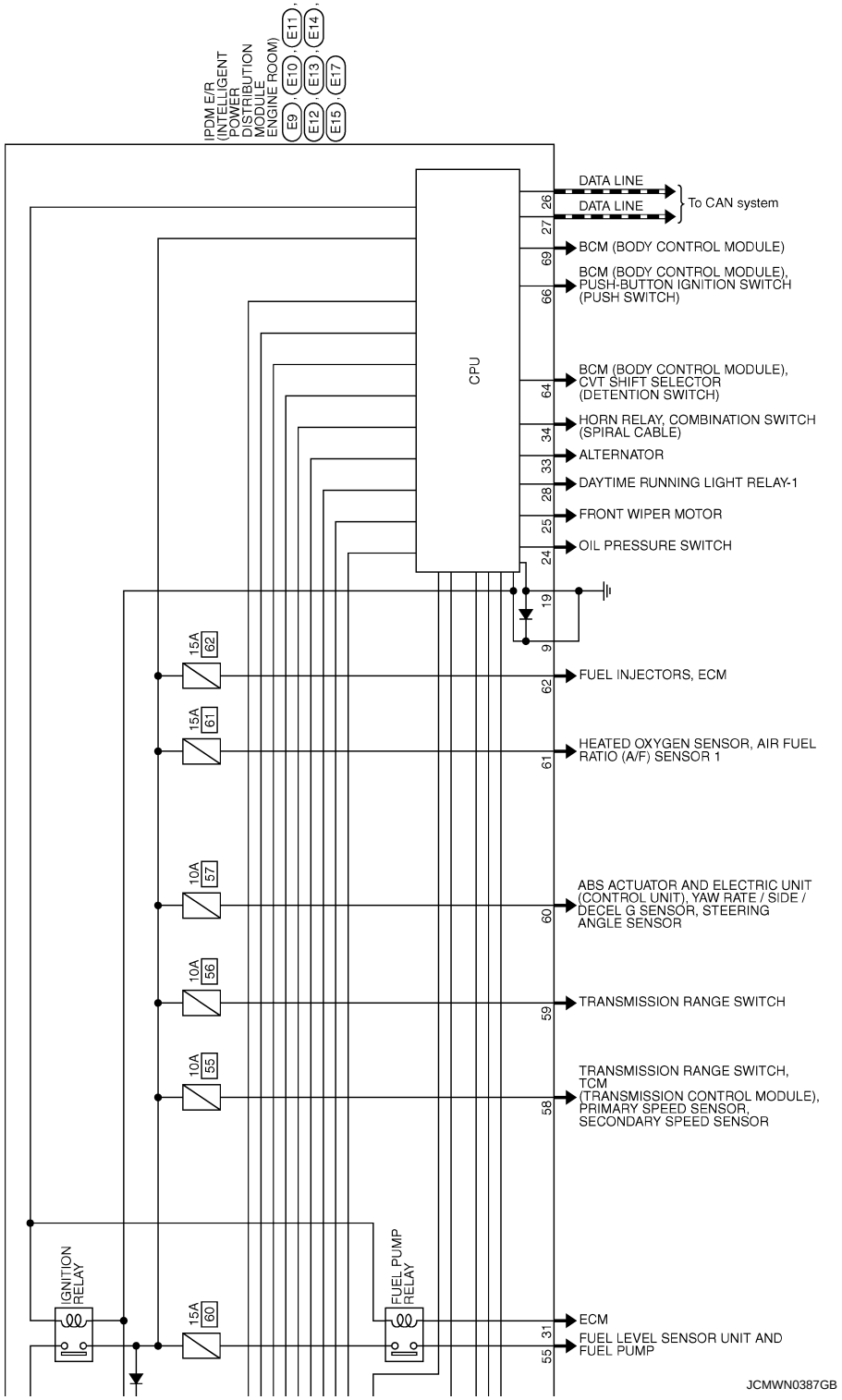
INFOID:0000000007970530

For connector terminal arrangements, harness layouts, and alphabets in a ⬡ (option abbreviation; if not described in wiring diagram), refer to GI-12, "Connector Information".



JCMWN0385GB


IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E9, E10, E11, E12, E13, E14, E15, E17
60A D
20A 43
15A 64
15A 42
15A 41
ECM RELAY
THROTTLE CONTROL MOTOR RELAY
REAR WINDOW DEFOGGER RELAY
COOLING FAN RELAY-3
COOLING FAN RELAY-2
STARTER CONTROL RELAY
STARTER RELAY
2
3 STARTER MOTOR
4 FUSE AND FUSIBLE LINK BLOCK
30 BCM (BODY CONTROL MODULE)
47 BCM (BODY CONTROL MODULE), TRANSMISSION RANGE SWITCH, ECM
45 TCM (TRANSMISSION CONTROL MODULE), NATS ANTENNA AMP., ECM
40 ECM
43 ECM, MASS AIR FLOW SENSOR, EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE
44 INTAKE VALVE TIMING CONTROL SOLENOID VALVE, CONDENSER, IGNITION COILS, EVAP CANISTER VENT CONTROL VALVE, ECM
57, 54 ECM
13 A/C AUTO AMP., DOOR MIRRORS, REAR WINDOW DEFOGGER
10 COOLING FAN MOTOR
7 COOLING FAN MOTOR
JCMWN0386GB



WITH INTELLIGENT KEY : Fail-Safe

INFOID:0000000007970531

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 operation
Cooling fan	• The cooling fan relay-1, the cooling fan relay-2 and the cooling fan relay-3 turn ON when the ignition switch is turned ON (Cooling fan HI operation) • The cooling fan relay-1, the cooling fan relay-2 and the cooling fan relay-3 turn OFF when the ignition switch is turned OFF
A/C compressor	A/C relay OFF
Alternator	Outputs the power generation command signal (PWM signal) 0%

If No CAN Communication Is Available With BCM

Control part	Fail-safe operation
Headlamp	• Turns ON the headlamp low relay when the ignition switch is turned ON • Turns OFF the headlamp low relay when the ignition switch is turned OFF • Headlamp high relay OFF • Daytime running light relay OFF*
• Parking lamps • Side marker lamps • License plate lamps • Illuminations • Tail lamps	• Turns ON the tail lamp relay when the ignition switch is turned ON • Turns OFF the tail lamp relay when the ignition switch is turned OFF
Front wiper	• The status just before activation of fail-safe control is maintained until the ignition switch is turned OFF while the front wiper is operating at LO or HI speed. • The wiper is operated at LO speed until the ignition switch is turned OFF if the fail-safe control is activated while the front wiper is set in the INT mode and the front wiper motor is operating.
Front fog lamps	Front fog lamp relay OFF
Horn	Horn OFF
Ignition relay	The status just before activation of fail-safe is maintained.
Starter motor	Starter control relay OFF

*: With daytime running light system

IGNITION RELAY MALFUNCTION DETECTION FUNCTION

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

Voltage judgment		IPDM E/R judgment	Operation
Ignition relay contact side	Ignition relay excitation coil side		
ON	ON	Ignition relay ON normal	—
OFF	OFF	Ignition relay OFF normal	—
ON	OFF	Ignition relay ON stuck	• Detects DTC “B2098: IGN RELAY ON” • Turns ON the tail lamp relay for 10 minutes
OFF	ON	Ignition relay OFF stuck	Detects DTC “B2099: IGN RELAY OFF”

FRONT WIPER CONTROL

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

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

NOTE:
This operation status can be confirmed on the IPDM E/R “Data Monitor” that displays “BLOCK” for the item “WIP PROT” while the wiper is stopped.

STARTER MOTOR PROTECTION FUNCTION

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

WITH INTELLIGENT KEY : DTC Index

INFOID:0000000007970532

NOTE:
- The details of time display are as follows.
- CRNT: A malfunction is detected now.
- PAST: A malfunction was detected in the past.
- IGN counter is displayed on FFD (Freeze Frame data).
- The number is 0 when is detected now.
- The number increases like 1 → 2 ··· 38 → 39 after returning to the normal condition whenever IGN OFF → ON.
- The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.

×: Applicable

CONSULT display	Fail-safe	Refer to
No DTC is detected. further testing may be required.	—	—
U1000: CAN COMM CIRCUIT	×	PCS-16
B2098: IGN RELAY ON	×	PCS-17
B2099: IGN RELAY OFF	—	PCS-18
B210B: START CONT RLY ON	—	SEC-78
B210C: START CONT RLY OFF	—	SEC-79
B210D: STARTER RELAY ON	—	SEC-80
B210E: STARTER RELAY OFF	—	SEC-81
B210F: INTRLCK/PNP SW ON	—	SEC-83
B2110: INTRLCK/PNP SW OFF	—	SEC-85

WITHOUT INTELLIGENT KEY

WITHOUT INTELLIGENT KEY : Reference Value

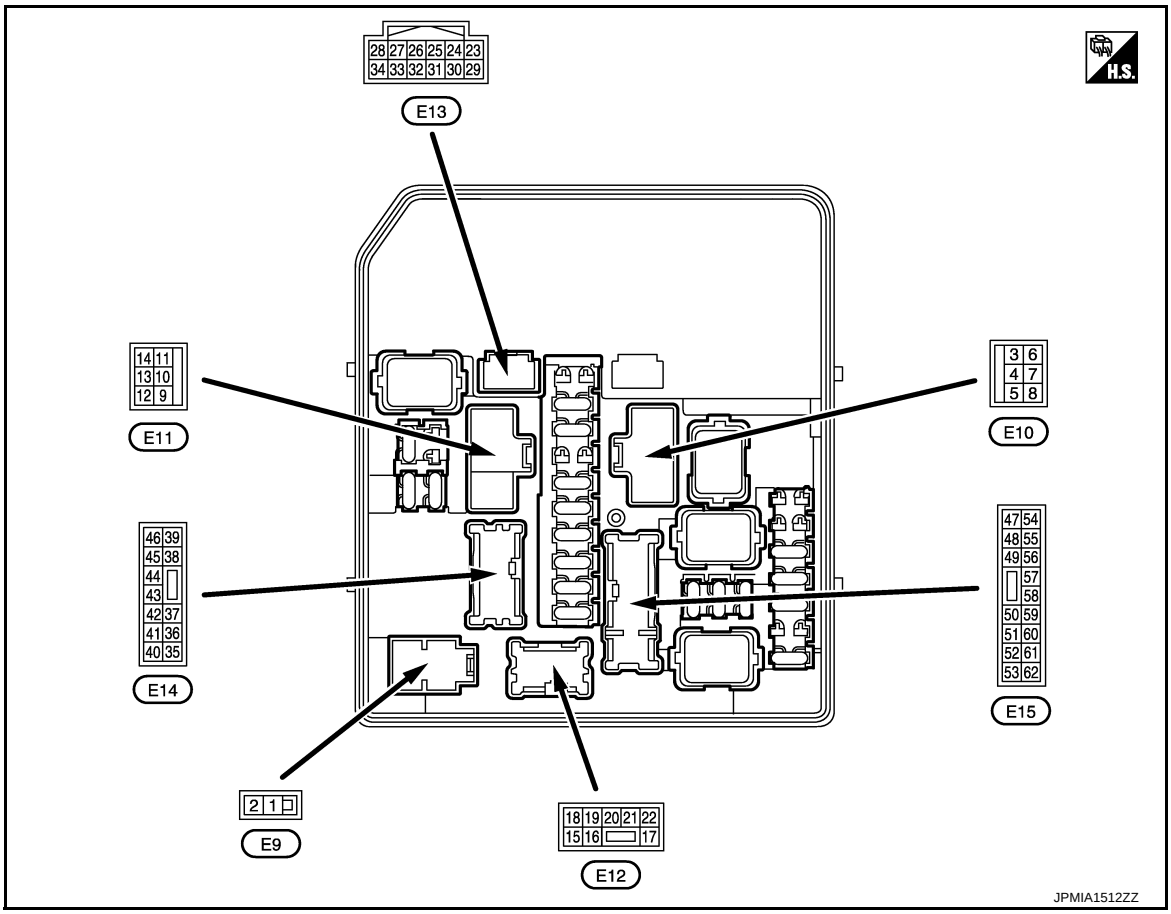
INFOID:0000000007970533

VALUES ON THE DIAGNOSIS TOOL

Monitor Item	Condition		Value/Status
MOTOR FAN REQ	Engine idle speed	Changes depending on engine coolant temperature, air conditioner operation status, vehicle speed, etc.	1/2/3/4
AC COMP REQ	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, HI or AUTO (Light is illuminated)		On

Monitor Item	Condition		Value/Status
HL LO REQ	Lighting switch OFF		Off
	Lighting switch 2ND, HI or AUTO (Light is illuminated)		On
HL HI REQ	Lighting switch OFF		Off
	Lighting switch HI		On
FR FOG REQ	Lighting switch 2ND or AUTO (Light is illuminated)	Front fog lamp switch OFF	Off
		Front fog lamp switch ON	On
FR WIP REQ	Ignition switch ON	Front wiper switch OFF	Stop
		Front wiper switch INT	1LOW
		Front wiper switch LO	Low
		Front wiper switch HI	Hi
WIP AUTO STOP	Ignition switch ON	Front wiper stop position	STOP P
		Any position other than front wiper stop position	ACT P
WIP PROT	Ignition switch ON	Front wiper operates normally	Off
		Front wiper stops at fail-safe operation	BLOCK
IGN RLY	Ignition switch OFF or ACC		Off
	Ignition switch ON		On
INTER/NP SW	Ignition switch ON	Selector lever in any position other than P or N (CVT models)	Off
		Selector lever in P or N position (CVT models)	On
ST RLY -REQ	Ignition switch OFF or ACC		Off
	Ignition switch ON		On
DTRL REQ **NOTE:** This item is monitored only on the vehicle with the daytime running light system.	Not operation		Off
	Daytime running light system is operated.		On
OIL P SW	Ignition switch OFF, ACC or engine running		Open
	Ignition switch ON		Close
HOOD SW	**NOTE:** The item is indicated, but not monitored.		Off
THFT HRN REQ	Not operation		Off
	• Panic alarm is activated • Horn is activated with VEHICLE SECURITY (THEFT WARNING) SYSTEM		On
HORN CHIRP	Not operating		Off
	Door locking with key fob (horn chirp mode)		On

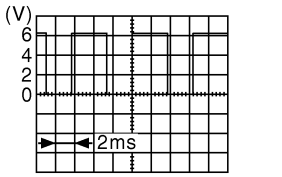
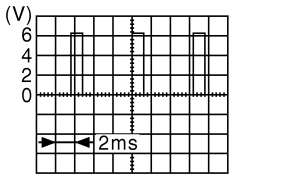
TERMINAL LAYOUT



PHYSICAL VALUES

Terminal NO. (Wire color)		Description		Condition	Value (Approx.)
		Signal name	Input/ Output		
+	–				
1 (R)	Ground	Battery power supply	Input	Ignition switch OFF	Battery voltage
2 (G)	Ground	Battery power supply	Input	Ignition switch OFF	Battery voltage
3 (BR)	Ground	Starter motor	Output	Ignition switch ON	0 V
				At engine cranking	Battery voltage
5 (LG)	Ground	Cooling fan relay-1 power supply	Output	Cooling fan OFF	0 V
				Cooling fan operated	Battery voltage
6 (SB)	Ground	Ignition switch START	Output	Any position other ignition switch START	0 V
				Ignition switch START	Battery voltage
7 (Y)	Ground	Cooling fan relay-2 power supply	Output	Cooling fan OFF	0 V
				Cooling fan LO operated	9.0 V
				Cooling fan HI operated	Battery voltage
8 (V)	Ground	Battery power supply	Input	Ignition switch OFF	Battery voltage
9 (B/W)	Ground	Ground	—	Ignition switch ON	0 V

Terminal NO. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
10 (L)	Ground	Cooling fan motor ground	Output	Cooling fan OFF		0 V
				Cooling fan LO operated		5.0 V
				Cooling fan HI operated		0 V
13 (W)	Ground	Rear window defogger	Output	Ignition switch ON	Rear window defogger switch OFF	0 V
					Rear window defogger switch ON	Battery voltage
18 (Y)	Ground	Ignition switch	Output	Ignition switch OFF		0 V
				Ignition switch ON		Battery voltage
19 (B/W)	Ground	Ground	—	Ignition switch ON		0 V
21 (W)	Ground	Front fog lamp (RH)	Output	Lighting switch 2ND	Front fog lamp switch OFF	0 V
					Front fog lamp switch ON	Battery voltage
22 (V)	Ground	Front fog lamp (LH)	Output	Lighting switch 2ND	Front fog lamp switch OFF	0 V
					Front fog lamp switch ON	Battery voltage
24 (LG)	Ground	Oil pressure switch	Input	Ignition switch ON	Engine stopped	0 V
					Engine running	Battery voltage
25 (Y)	Ground	Front wiper auto stop	Input	Ignition switch ON	Front wiper stop position	0 V
					Any position other than front wiper stop position	Battery voltage
26 (P)	Ground	CAN-L	Input/ Output	—		—
27 (L)	Ground	CAN-H	Input/ Output	—		—
28*1 (P)	Ground	Daytime running light relay-1 control	Output	Daytime running light deactivated		0 V
				Daytime running light activated		Battery voltage
31 (W)	Ground	Fuel pump relay control	Output	• Approximately 1 second after turning the ignition switch ON • Engine running		0 - 1.5 V
				Approximately 1 second or more after turning the ignition switch ON		Battery voltage

Terminal NO. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
33 (O)	Ground	Power generation command signal	Output	Ignition switch ON		Battery voltage
				40 % is set on “ACTIVE TEST”, “ALTERNATOR DUTY” of “ENGINE”		 JPMIA0002GB 3.8 V
				80 % is set on “ACTIVE TEST”, “ALTERNATOR DUTY” of “ENGINE”		 JPMIA0003GB 1.4 V
34 (R)	Ground	Horn relay control	Output	The horn is deactivated		Battery voltage
				The horn is activated		0 V
36 (Y)	Ground	Parking lamp (LH)	Output	Ignition switch ON	Lighting switch OFF	0 V
					Lighting switch 1ST	Battery voltage
37 (V)	Ground	Parking lamp (RH)	Output	Ignition switch ON	Lighting switch OFF	0 V
					Lighting switch 1ST	Battery voltage
38 (G)	Ground	Tail lamp (RH) & illuminations	Output	Ignition switch ON	Lighting switch OFF	0 V
					Lighting switch 1ST	Battery voltage
39 (V)	Ground	Front wiper HI	Output	Ignition switch ON	Front wiper switch OFF	0 V
					Front wiper switch HI	Battery voltage
40 (R)	Ground	ECM relay control	Output	Ignition switch OFF (More than a few seconds after turning ignition switch OFF)		Battery voltage
				• Ignition switch ON • Ignition switch OFF (For a few seconds after turning ignition switch OFF)		0 - 1.5 V
41 (SB)	Ground	Tail lamp (LH) & license plate lamps	Output	Ignition switch ON	Lighting switch OFF	0 V
					Lighting switch 1ST	Battery voltage
43 (G)	Ground	ECM relay power supply	Output	Ignition switch OFF (More than a few seconds after turning ignition switch OFF)		0 V
				• Ignition switch ON • Ignition switch OFF (For a few seconds after turning ignition switch OFF)		Battery voltage

Terminal NO. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
44 (P)	Ground	ECM relay power supply	Output	Ignition switch OFF (More than a few seconds after turning ignition switch OFF)		0 V
				• Ignition switch ON • Ignition switch OFF (For a few seconds after turning ignition switch OFF)		Battery voltage
45 (Y)	Ground	TCM power supply	Output	Ignition switch OFF		Battery voltage
46 (O)	Ground	Front wiper LO	Output	Ignition switch ON	Front wiper switch OFF	0 V
					Front wiper switch LO	Battery voltage
47 (BR)	Ground	Transmission range switch*2	Input	Select lever in any position other than P or N (Ignition switch ON)		0 V
				Select lever P or N (Ignition switch ON)		Battery voltage
		Clutch interlock switch*3	Input	Release the clutch pedal		0 V
				Depress the clutch pedal		Battery voltage
49 (W)	Ground	Headlamp HI (RH)	Output	Ignition switch ON	Lighting switch OFF	0 V
					• Lighting switch HI • Lighting switch PASS	Battery voltage
				Daytime running light activated*1		7.0 V
50 (GR)	Ground	Headlamp HI (LH)	Output	Ignition switch ON	Lighting switch OFF	0 V
					• Lighting switch HI • Lighting switch PASS	Battery voltage
				Daytime running light activated*1		7.0 V
51 (R)	Ground	Headlamp LO (LH)	Output	Ignition switch ON	Lighting switch OFF	0 V
					Lighting switch 2ND	Battery voltage
52 (P)	Ground	Headlamp LO (RH)	Output	Ignition switch ON	Lighting switch OFF	0 V
		Daytime running light relay-2*1			Lighting switch 2ND	Battery voltage
54 (GR)	Ground	Throttle control motor relay power supply	Output	Ignition switch OFF (More than a few seconds after turning ignition switch OFF)		0 V
				• Ignition switch ON • Ignition switch OFF (For a few seconds after turning ignition switch OFF)		Battery voltage
55 (P)	Ground	Fuel pump power supply	Output	Approximately 1 second or more than after turning the ignition switch ON		0 V
				• Approximately 1 second after turning the ignition switch ON • Engine running		Battery voltage
56 (SB)	Ground	A/C relay power supply	Output	Engine running	A/C switch OFF	0 V
					A/C switch ON (A/C compressor is operating)	Battery voltage

Terminal NO. (Wire color)		Description		Condition	Value (Approx.)
		Signal name	Input/ Output		
+	–				
57 (G)	Ground	Throttle control motor relay control	Output	Ignition switch ON → OFF	0 - 1.0 V ↓ Battery voltage ↓ 0 V
				Ignition switch ON	0 - 1.0 V
58 (R)*2 (Y)*3	Ground	Ignition relay power supply	Output	Ignition switch OFF	0 V
				Ignition switch ON	Battery voltage
59 (Y)	Ground	Ignition relay power supply	Output	Ignition switch OFF	0 V
				Ignition switch ON	Battery voltage
60 (V)	Ground	Ignition relay power supply	Output	Ignition switch OFF	0 V
				Ignition switch ON	Battery voltage
61 (W)	Ground	Ignition relay power supply	Output	Ignition switch OFF	0 V
				Ignition switch ON	Battery voltage
62 (L)	Ground	Ignition relay power supply	Output	Ignition switch OFF	0 V
				Ignition switch ON	Battery voltage

*1: With daytime running light system

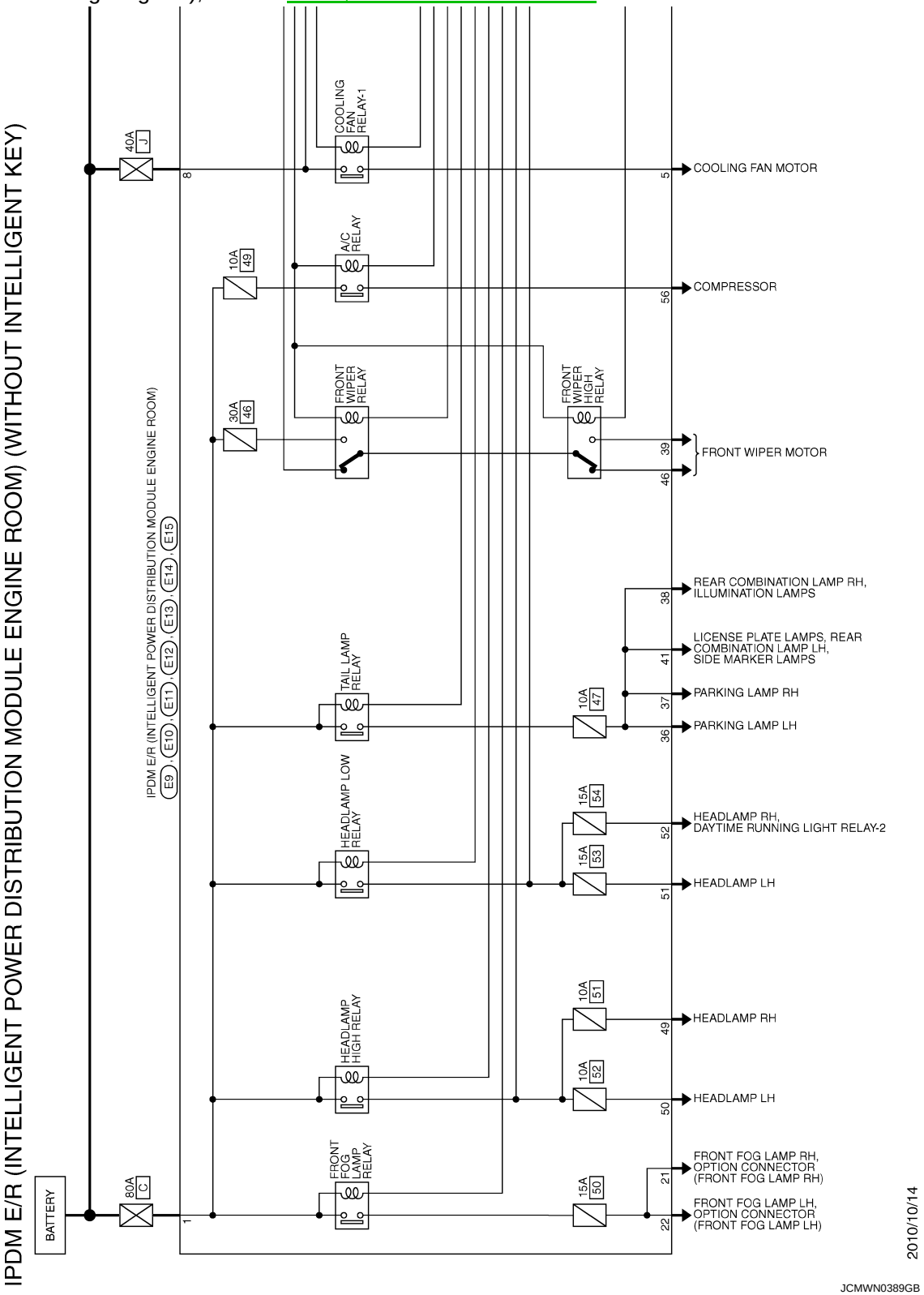
*2: CVT models

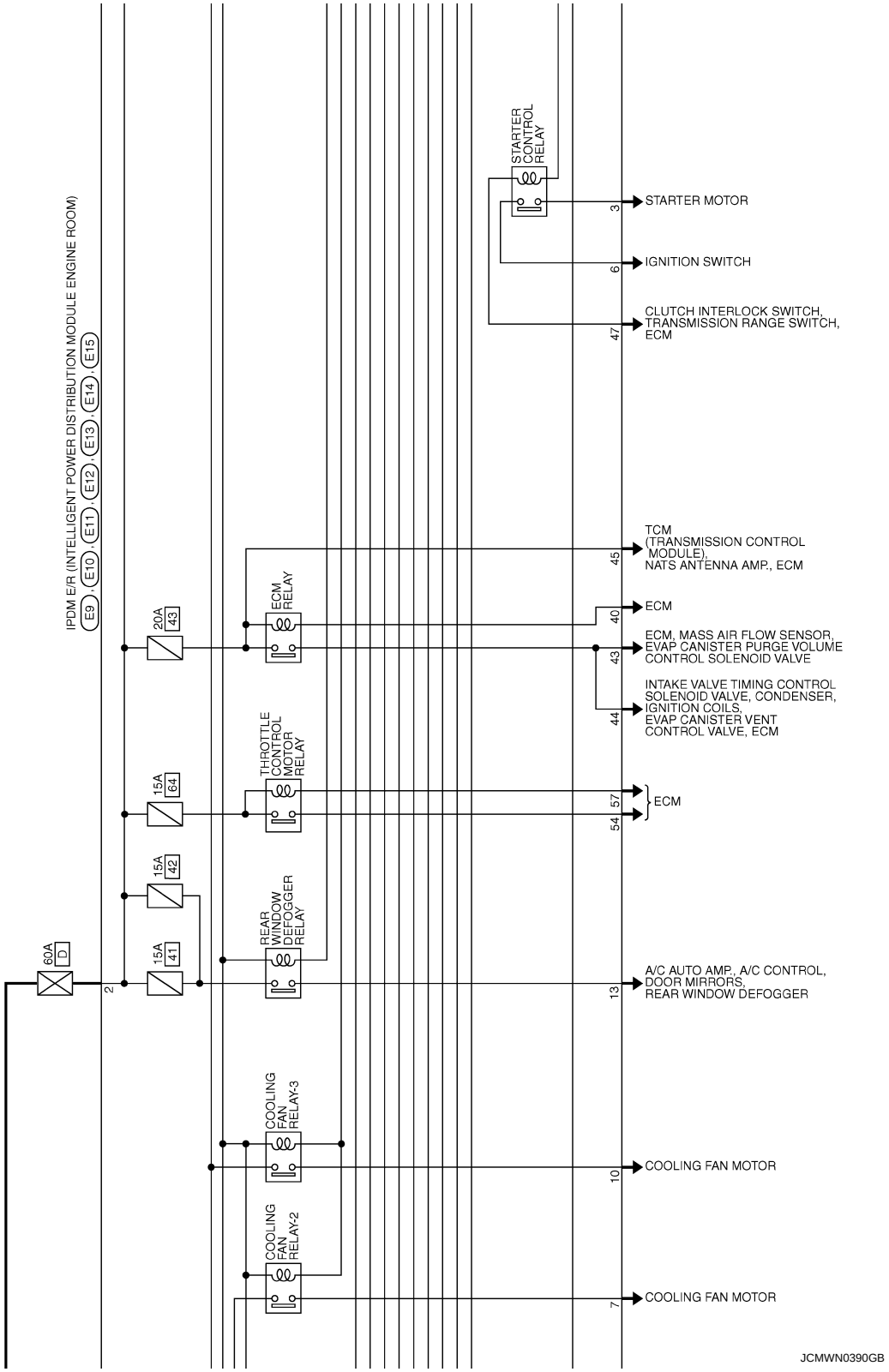
*3: M/T models

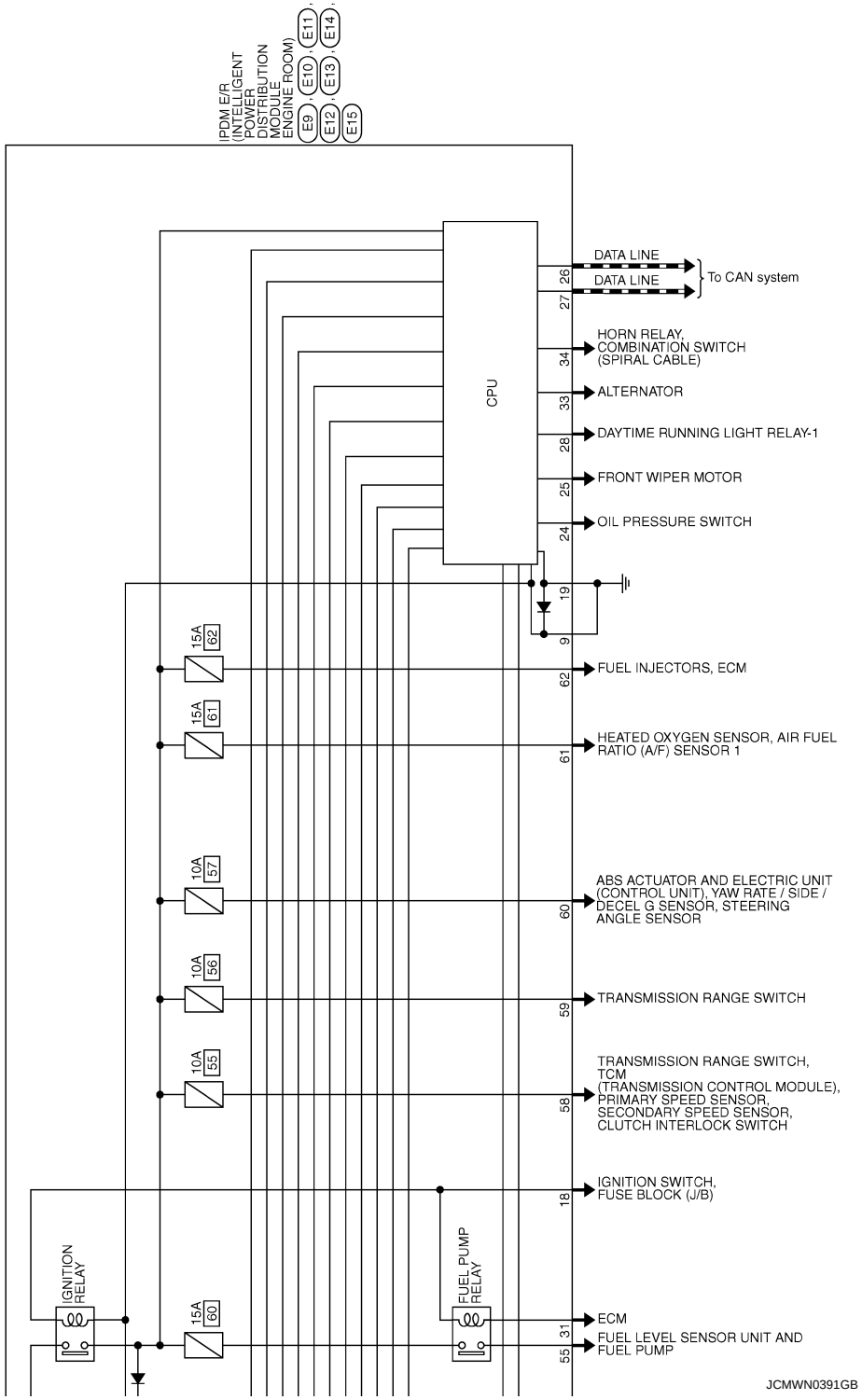
WITHOUT INTELLIGENT KEY : Wiring Diagram — IPDM E/R —

INFOID:0000000007970534

For connector terminal arrangements, harness layouts, and alphabets in a ⬡ (option abbreviation; if not described in wiring diagram), refer to GI-12, "Connector Information".




IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E9 , E10 , E11 , E12 , E13 , E14 , E15
60A D1
2
20A 43
15A 64
15A 42
15A 41
ECM RELAY
THROTTLE CONTROL MOTOR RELAY
REAR WINDOW DEFOGGER RELAY
COOLING FAN RELAY-3
COOLING FAN RELAY-2
STARTER CONTROL RELAY
3 STARTER MOTOR
6 IGNITION SWITCH
47 CLUTCH INTERLOCK SWITCH, TRANSMISSION RANGE SWITCH, ECM
45 TCM (TRANSMISSION CONTROL MODULE), NATS ANTENNA AMP., ECM
40 ECM
43 ECM, MASS AIR FLOW SENSOR, EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE
44 INTAKE VALVE TIMING CONTROL SOLENOID VALVE, CONDENSER, IGNITION COILS, EVAP CANISTER VENT CONTROL VALVE, ECM
57 54 ECM
13 A/C AUTO AMP., A/C CONTROL, DOOR MIRRORS, REAR WINDOW DEFOGGER
10 COOLING FAN MOTOR
7 COOLING FAN MOTOR
JCMWN0390GB



WITHOUT INTELLIGENT KEY : Fail-Safe

INFOID:0000000007970535

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 operation
Cooling fan	• The cooling fan relay-1, the cooling fan relay-2 and the cooling fan relay-3 turn ON when the ignition switch is turned ON (Cooling fan HI operation) • The cooling fan relay-1, the cooling fan relay-2 and the cooling fan relay-3 turn OFF when the ignition switch is turned OFF
A/C compressor	A/C relay OFF
Alternator	Outputs the power generation command signal (PWM signal) 0%

If No CAN Communication Is Available With BCM

Control part	Fail-safe operation
Headlamp	• Turns ON the headlamp low relay when the ignition switch is turned ON • Turns OFF the headlamp low relay when the ignition switch is turned OFF • Headlamp high relay OFF • Daytime running light relay OFF*
• Parking lamps • Side marker lamps • License plate lamps • Illuminations • Tail lamps	• Turns ON the tail lamp relay when the ignition switch is turned ON • Turns OFF the tail lamp relay when the ignition switch is turned OFF
Front wiper	• The status just before activation of fail-safe control is maintained until the ignition switch is turned OFF while the front wiper is operating at LO or HI speed. • The wiper is operated at LO speed until the ignition switch is turned OFF if the fail-safe control is activated while the front wiper is set in the INT mode and the front wiper motor is operating.
Front fog lamps	Front fog lamp relay OFF
Rear window defogger relay	Rear window defogger relay OFF
Horn	Horn OFF

*: With daytime running light system

IGNITION RELAY MALFUNCTION DETECTION FUNCTION

- IPDM E/R monitors the voltage at the contact circuit of the ignition relay inside and ignition switch status from BCM via CAN communication.
- IPDM E/R judges the ignition relay error if the voltage differs between the contact circuit and the ignition switch status from BCM via CAN communication.
- 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.

Voltage judgment		IPDM E/R judgment	Operation
Ignition relay contact side	Ignition switch status from BCM		
ON	ON	Ignition relay ON normal	—
OFF	OFF	Ignition relay OFF normal	—
ON	OFF	Ignition relay ON stuck	• Detects DTC “B2098: IGN RELAY ON” • Turns ON the tail lamp relay for 10 minutes
OFF	ON	Ignition relay OFF stuck	Detects DTC “B2099: IGN RELAY OFF”

FRONT WIPER CONTROL

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

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

WITHOUT INTELLIGENT KEY : DTC Index

INFOID:0000000007970536

NOTE:
- The details of time display are as follows.
- CRNT: A malfunction is detected now.
- PAST: A malfunction was detected in the past.
- IGN counter is displayed on FFD (Freeze Frame data).
- The number is 0 when is detected now.
- The number increases like 1 → 2 ··· 38 → 39 after returning to the normal condition whenever IGN OFF → ON.
- The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.

×: Applicable

CONSULT display	Fail-safe	Refer to
No DTC is detected. further testing may be required.	—	—
U1000: CAN COMM CIRCUIT	×	PCS-16
B2098: IGN RELAY ON	×	PCS-17
B2099: IGN RELAY OFF	—	PCS-47

SYMPTOM DIAGNOSIS

THE FUEL GAUGE INDICATOR DOES NOT OPERATE

Description

INFOID:0000000007769621

Fuel gauge will not indicate from a certain position.

Diagnosis Procedure

INFOID:0000000007769622

1.CHECK COMBINATION METER INPUT SIGNAL

1. Connect CONSULT.
2. 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. Refer to MWI-42, "Component Function Check".

Does monitor value match fuel gauge reading?

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-42, "Diagnosis Procedure".

Is the inspection result normal?

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

3.CHECK FUEL LEVEL SENSOR UNIT

Perform a unit check for the fuel level sensor unit. Refer to MWI-43, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace fuel level sensor unit. Refer to FL-5, "Removal and Installation".

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.

THE OIL PRESSURE WARNING LAMP DOES NOT TURN ON

Description

INFOID:0000000007769623

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

Diagnosis Procedure

INFOID:0000000007769624

1.CHECK OIL PRESSURE WARNING LAMP

Perform auto active test. Refer to PCS-11, "Diagnosis Description" (With I-KEY) or PCS-40, "Diagnosis Description" (Without I-KEY).

Is oil pressure warning lamp blinking?

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

2.CHECK OIL PRESSURE SWITCH SIGNAL CIRCUIT

Check the oil pressure switch signal circuit. Refer to MWI-44, "Diagnosis Procedure".

Is the inspection result normal?

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

3.CHECK OIL PRESSURE SWITCH

Perform a unit check for the oil pressure switch. Refer to MWI-44, "Component Inspection".

Is the inspection result normal?

YES >> Replace IPDM E/R.
NO >> Replace oil pressure switch.

4.CHECK COMBINATION METER INPUT SIGNAL

Connect CONSULT and perform an input signal check for the combination meter. Refer to MWI-44, "Component Function Check".

Is the inspection result normal?

YES >> Replace combination meter.
NO >> Replace IPDM E/R. Refer to PCS-33, "Removal and Installation" (With I-KEY) or PCS-62, "Removal and Installation" (Without I-KEY).

THE OIL PRESSURE WARNING LAMP DOES NOT TURN OFF

Description

INFOID:0000000007769625

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

Diagnosis Procedure

INFOID:0000000007769626

1.CHECK OIL PRESSURE WARNING LAMP

Perform auto active test. Refer to PCS-11, "Diagnosis Description" (With I-KEY) or PCS-40, "Diagnosis Description" (Without I-KEY).

Is oil pressure warning lamp blinking?

YES >> GO TO 2.
NO >> GO TO 5.

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 and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Oil pressure switch		Ground	
Connector	Terminal		
F63	1		12 V

Is the inspection result normal?

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

3.CHECK OIL PRESSURE SWITCH

Perform a unit check for the oil pressure switch. Refer to MWI-44, "Component Inspection".

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-33, "Removal and Installation" (With I-KEY) or PCS-62, "Removal and Installation" (Without I-KEY).
NO >> Replace oil pressure switch.

4.CHECK OIL PRESSURE SWITCH SIGNAL CIRCUIT

Check the oil pressure switch signal circuit. Refer to MWI-44, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair harness or connector.

5.CHECK COMBINATION METER INPUT SIGNAL

Connect CONSULT and perform an input signal check for the combination meter. Refer to MWI-44, "Component Function Check".

Is the inspection result normal?

YES >> Replace combination meter.
NO >> Replace IPDM E/R. Refer to PCS-33, "Removal and Installation" (With I-KEY) or PCS-62, "Removal and Installation" (Without I-KEY).

THE AMBIENT TEMPERATURE DISPLAY IS INCORRECT

Description

INFOID:0000000007769627

- The displayed ambient air temperature is higher than the actual temperature.
- The displayed ambient air temperature is lower than the actual temperature.
- Ambient air temperature is not indicated.

Diagnosis Procedure

INFOID:0000000007769628

NOTE:
Check that the symptom is not applicable to the normal operating condition before starting diagnosis. Refer to MWI-87, "INFORMATION DISPLAY : Description".

1.CHECK AMBIENT SENSOR SIGNAL CIRCUIT

Check the ambient sensor signal circuit. Refer to HAC-33, "Diagnosis Procedure".

Is the inspection result normal?

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

2.CHECK A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL CIRCUIT

Check the A/C auto amp. connection recognition signal circuit. Refer to MWI-48, "Diagnosis Procedure".

Is the inspection result normal?

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

3.CHECK AMBIENT SENSOR

Perform the part check for the ambient sensor. Refer to HAC-34, "Component Inspection".

Is the inspection result normal?

YES >> Replace combination meter. Refer to MWI-90, "Removal and Installation".
NO >> Replace ambient sensor. Refer to HAC-113, "Removal and Installation".

THE LOW WASHER FLUID WARNING LAMP DOES NOT TURN ON OR OFF

Description

INFOID:0000000007769629

- The low washer fluid warning lamp is still illuminated even after washer fluid is added.
- The low washer fluid warning lamp is not illuminated even though the washer tank is empty.

Diagnosis Procedure

INFOID:0000000007769630

1.CHECK WASHER LEVEL SWITCH SIGNAL CIRCUIT

Check the washer level switch signal circuit. Refer to MWI-46, "Diagnosis Procedure".

Is the inspection result normal?

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

2.CHECK WASHER LEVEL SWITCH

Perform a unit check for the washer level switch. Refer to MWI-46, "Component Inspection".

Is the inspection result normal?

YES >> Replace combination meter.
NO >> Replace washer level switch. Refer to WW-121, "Removal and Installation".

NORMAL OPERATING CONDITION
INFORMATION DISPLAY

INFORMATION DISPLAY : Description

INFOID:0000000007769631

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 ambient sensor signal by the combination meter. Refer to MWI-24, "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 15 ℓ (4 US gal, 3-1/4 Imp 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 performing.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000007769632

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

WARNING:

Always observe the following items for preventing accidental activation.

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

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

WARNING:

Always observe the following items for preventing accidental activation.

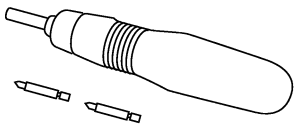
- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious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

PREPARATION

PREPARATION

Commercial Service Tools

INFOID:0000000007769633

Tool name	Description
Power tool  PBIC0191E	Loosening bolts and nuts

REMOVAL AND INSTALLATION

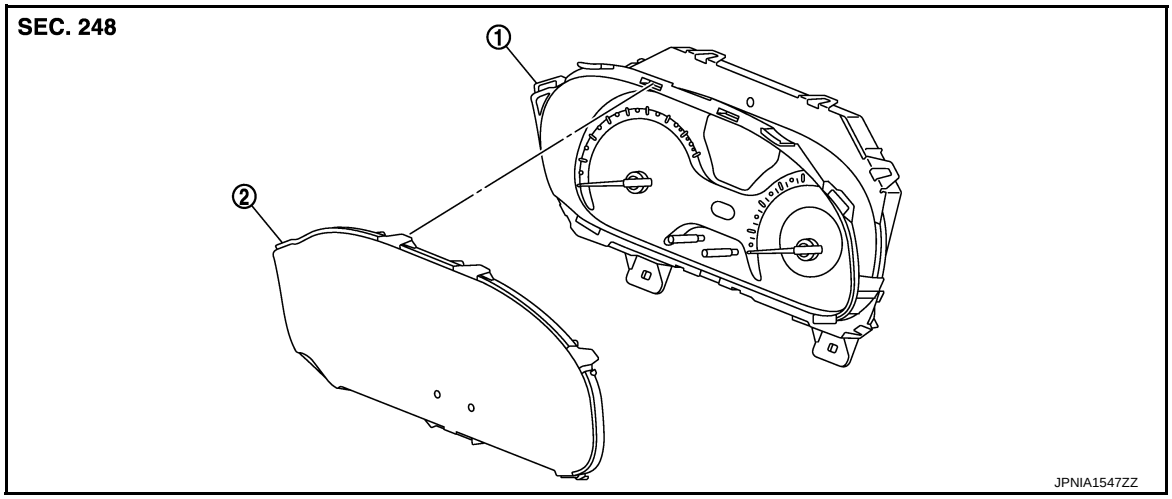
COMBINATION METER

Exploded View

INFOID:0000000007769634

REMOVAL
Refer to IP-12, "Exploded View".

DISASSEMBLY

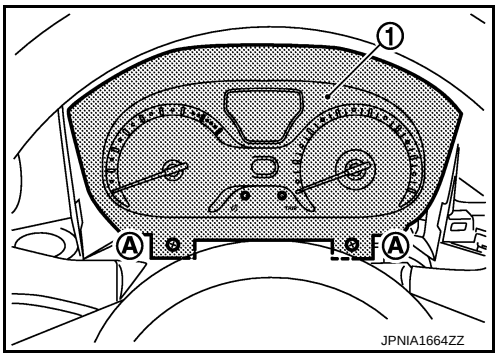


1. Unified meter control unit
2. Front cover

Removal and Installation

INFOID:0000000007769635

REMOVAL
1. Remove the cluster lid A. Refer to IP-13, "Removal and Installation".
2. Remove screws (A) and connector, and then remove combination meter (1).



INSTALLATION
Install in the reverse order of removal.

Disassembly and Assembly

INFOID:0000000007769636

DISASSEMBLY
Disengage the tabs to separate front cover.

ASSEMBLY
Assemble in the reverse order of disassembly.