SECTION DI
DRIVER INFORMATION SYSTEM

CONTENTS

PRECAUTION

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

EKS002GT

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. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Wiring Diagrams and Trouble Diagnosis

EKS002GU

When you read wiring diagrams, refer to the followings:

- Refer to GI-12, "How to Read Wiring Diagrams" .
- Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" for power distribution circuit.

When you perform trouble diagnosis, refer to the followings:

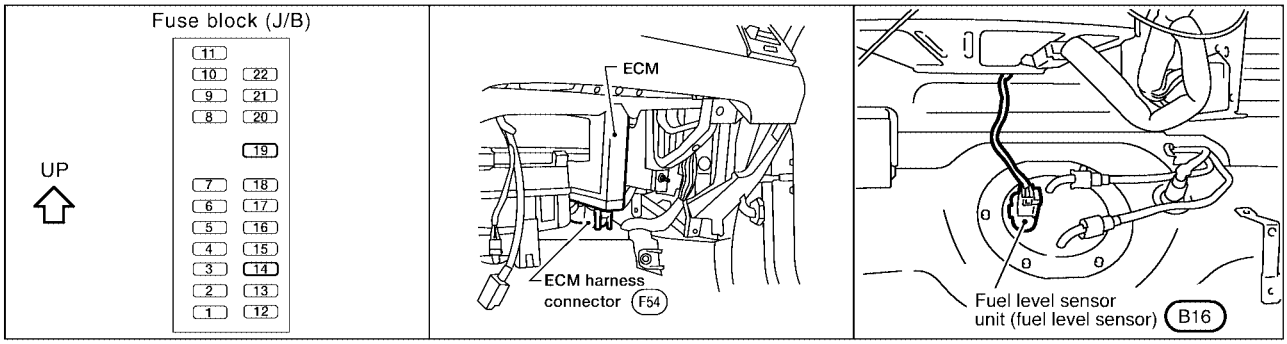
- Refer to GI-10, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES" .
- Refer to GI-25, "How to Perform Efficient Diagnosis for an Electrical Incident" .

COMBINATION METERS

PFP:24814

Component Parts and Harness Connector Location

EKS002GV



WKIA0059E

System Description

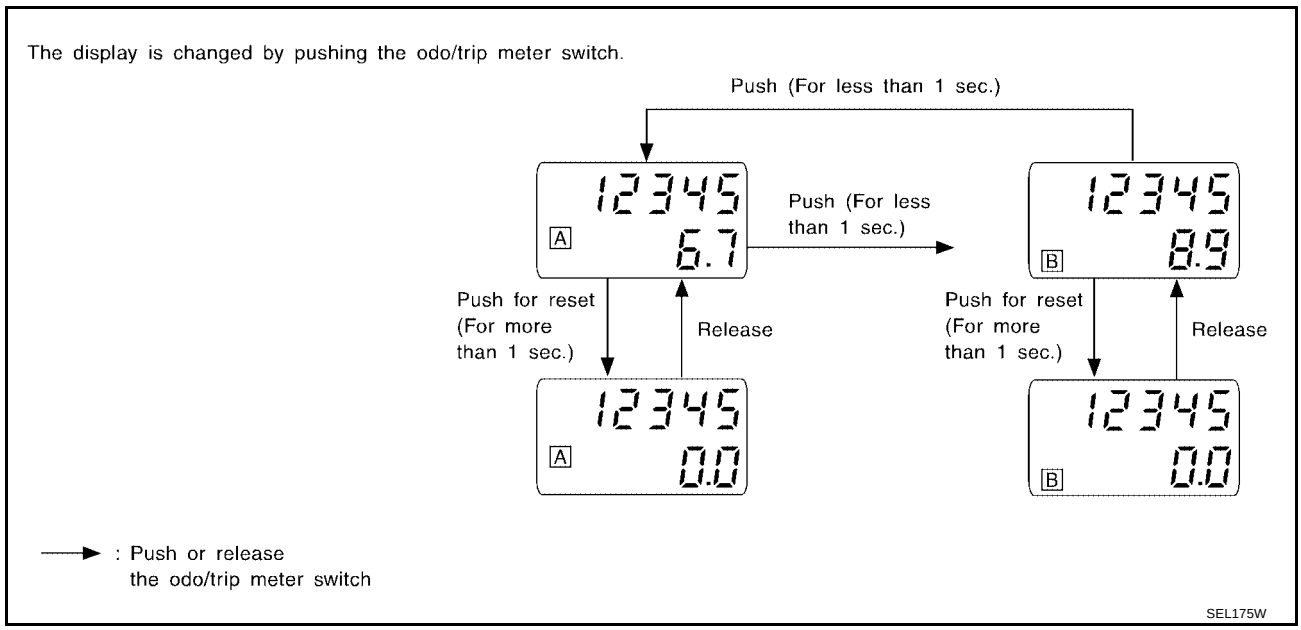
EKS002GW

UNIFIED CONTROL METER

- Speedometer, odo/trip meter, tachometer, fuel gauge and water temperature gauge are controlled by the unified meter control unit, which is built into the combination meter.
- Digital meter is adopted for odo/trip meter.*
  *The record of the odo meter is kept even if the battery cable is disconnected. The record of the trip meter is erased when the battery cable is disconnected.
- Odo/trip meter and A/T indicator segments can be checked in diagnosis mode.
- Meter/gauge can be checked in diagnosis mode.

HOW TO CHANGE THE DISPLAY FOR ODO/TRIP METER

- The vehicle speed signal and the memory signals from the meter memory circuit are processed by the combination meter and the mileage is displayed.
- Depressing the odometer/trip switch toggles the mode in the following order.



- The odo/trip meter display mode toggling and trip display resetting can be identified by the amount of time that elapses from pressing the odo/trip meter switch to releasing it.
- When resetting with trip A displayed, only trip A display is reset (Trip B operates the same way).

POWER SUPPLY AND GROUND CIRCUIT

Power is supplied at all times

- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to combination meter terminal 5.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to combination meter terminals 17 and 18.

Ground is supplied

- to combination meter terminals 6 and 39
- through body grounds M57 and M61.

WATER TEMPERATURE GAUGE

The water temperature gauge indicates the engine coolant temperature.
ECM provides a water temperature signal to combination meter for water temperature gauge with CAN communication line.

TACHOMETER

The tachometer indicates engine speed in revolutions per minute (rpm).
ECM provides an engine speed signal to combination meter for tachometer with CAN communication line.

FUEL GAUGE

The fuel gauge indicates the approximate fuel level in the fuel tank.
The fuel gauge is regulated by a variable ground signal supplied

- to combination meter terminal 12 for the fuel level sensor
- from terminal G of the fuel level sensor unit
- through terminal E of the fuel level sensor unit and
- through body grounds M57 and M61.

SPEEDOMETER

The vehicle speed sensor provides a vehicle speed signal to the combination meter for speedometer indication.

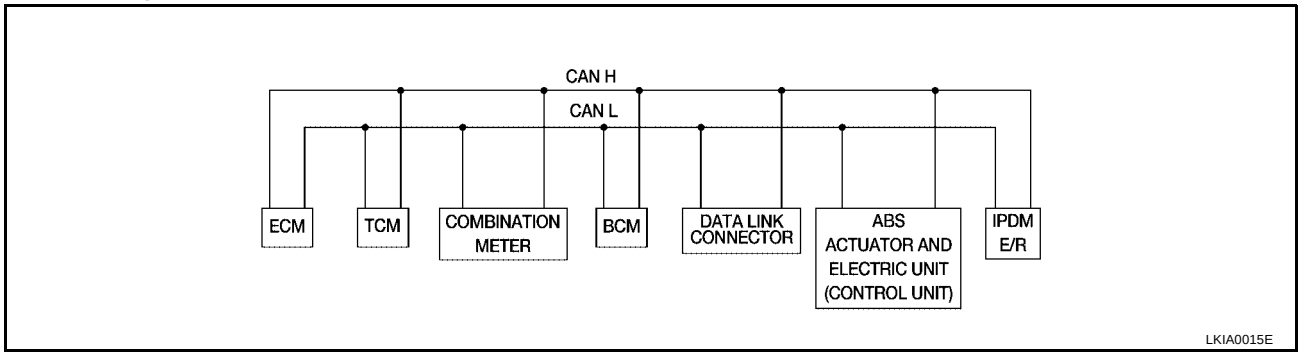
CAN Communication System Description

EKS002GX

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

FOR TCS MODELS

System Diagram



Input/Output Signal Chart

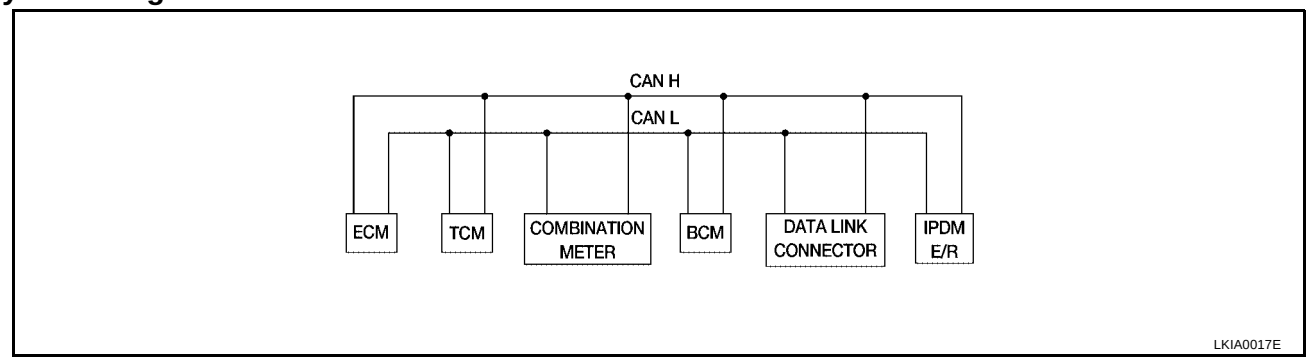
T: Transmit R: Receive

Signals	ECM	TCM	COMBINATION METER	BCM	ABS/TCS control unit	IPDM E/R
Engine speed signal	T		R		R	
Engine coolant temperature signal	T		R			
Accelerator pedal position signal	T					
Fuel consumption monitor signal	T		R			
A/T warning lamp signal		T	R			
A/T position indicator signal	R	T	R	R(R range only)	R	
ABS operation signal	R				T	
TCS operation signal	R	R			T	
Air conditioner switch signal	R			T		
Air conditioner compressor signal	R					T
A/C compressor request signal	T					R
Cooling fan motor operation signal	R					T
Cooling fan speed request signal	T					R
Position lights request			R	T		R
Position lights status				R		T
Low beam request				T		R
Low beam status	R			R		T
High beam request			R	T		R
High beam status	R			R		T
Front fog lights request				T		R
Front fog light status				R		T
OD cancel switch signal		R	T			R
Brake switch signal		R	T			
Vehicle speed signal	R		T			
	R		T	R		
Oil pressure switch			R			T
Sleep request1			R	T		
Sleep request2				T		R
N range switch signal		R	T			
P range switch signal		R	T			
Seat belt buckle switch signal			T	R		
Door switch signal			R	T		R
Tail lamp request			R	T		R
Turn indicator signal			R	T		
Buzzer output signal			R	T		
Trunk switch signal			R	T		
ASCD main switch signal	T		R			
ASCD cruise signal	T		R			
Wiper operation				R		T
Wiper stop position signal				R		T

Signals	ECM	TCM	COMBINATION METER	BCM	ABS/TCS control unit	IPDM E/R
Rear window defogger switch signal				T		R
Rear window defogger control signal	R			R		T

FOR A/T MODELS

System Diagram



Input/Output Signal Chart

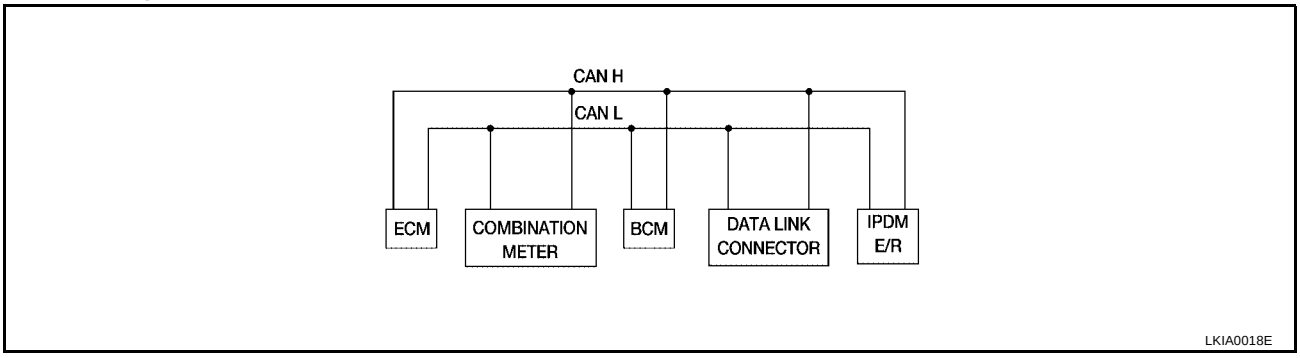
T: Transmit R: Receive

Signals	ECM	TCM	COMBINATION METER	BCM	IPDM E/R
Engine speed signal	T		R		
Engine coolant temperature signal	T		R		
Accelerator pedal position signal	T				R
Fuel consumption monitor signal	T		R		
A/T warning lamp signal		T	R		
A/T position indicator signal	R	T	R	R(R range only)	
Air conditioner switch signal	R			T	
Air conditioner compressor signal	R				T
A/C compressor request signal	T				R
Blower fan switch signal	R(QR25DE)			T	
Cooling fan motor operation signal	R			T	
Cooling fan speed request signal	T				R
Position lights request			R	T	R
Position lights status				R	T
Low beam request				T	R
Low beam status	R			R	T
High beam request			R	T	R
High beam status	R			R	T
Front fog lights request				T	R
Front fog light status				R	T
OD cancel switch signal		R	T		R
Brake switch signal		R	T		
Vehicle speed signal	R		T		
	R		T	R	
Oil pressure switch			R		T
Sleep request1			R	T	

Signals	ECM	TCM	COMBINATION METER	BCM	IPDM E/R
Sleep request2				T	R
N range switch signal		R	T		
P range switch signal		R	T		
Seat belt buckle switch signal			T	R	
Door switch signal			R	T	R
Tail lamp request			R	T	R
Turn indicator signal			R	T	
Buzzer output signal			R	T	
Trunk switch signal			R	T	
ASCD main switch signal	T		R		
ASCD cruise signal	T		R		
Wiper operation				R	T
Wiper stop position signal				R	T
Rear window defogger switch signal				T	R
Rear window defogger control signal	R			R	T

FOR M/T MODELS

System Diagram



Input/Output Signal Chart

T: Transmit R: Receive

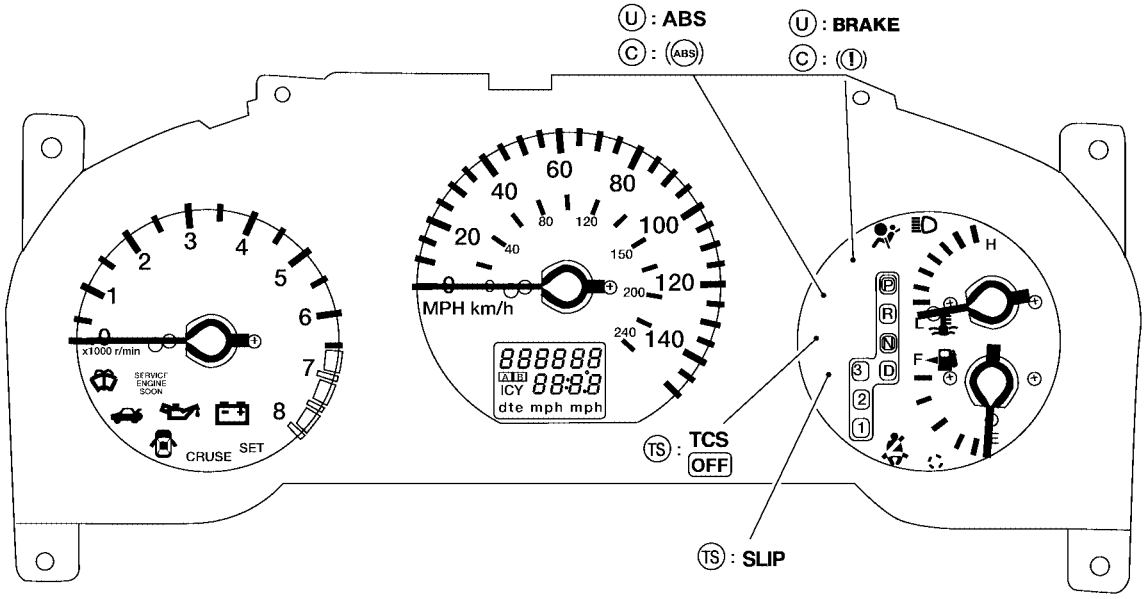
Signals	ECM	COMBINATION METER	BCM	IPDM E/R
Engine speed signal	T			
Engine coolant temperature signal	T			
Fuel consumption monitor signal	T			
Air conditioner switch signal	R		T	
Air conditioner compressor signal	R			T
A/C compressor request signal	T			R
Blower fan switch signal	R(QR25DE)		T	
Cooling fan motor operation signal	R			T
Cooling fan speed request signal	T			R
Position lights request		R	T	R
Position lights status			R	T
Low beam request			T	R
Low beam status	R		R	T
High beam request		R	T	R

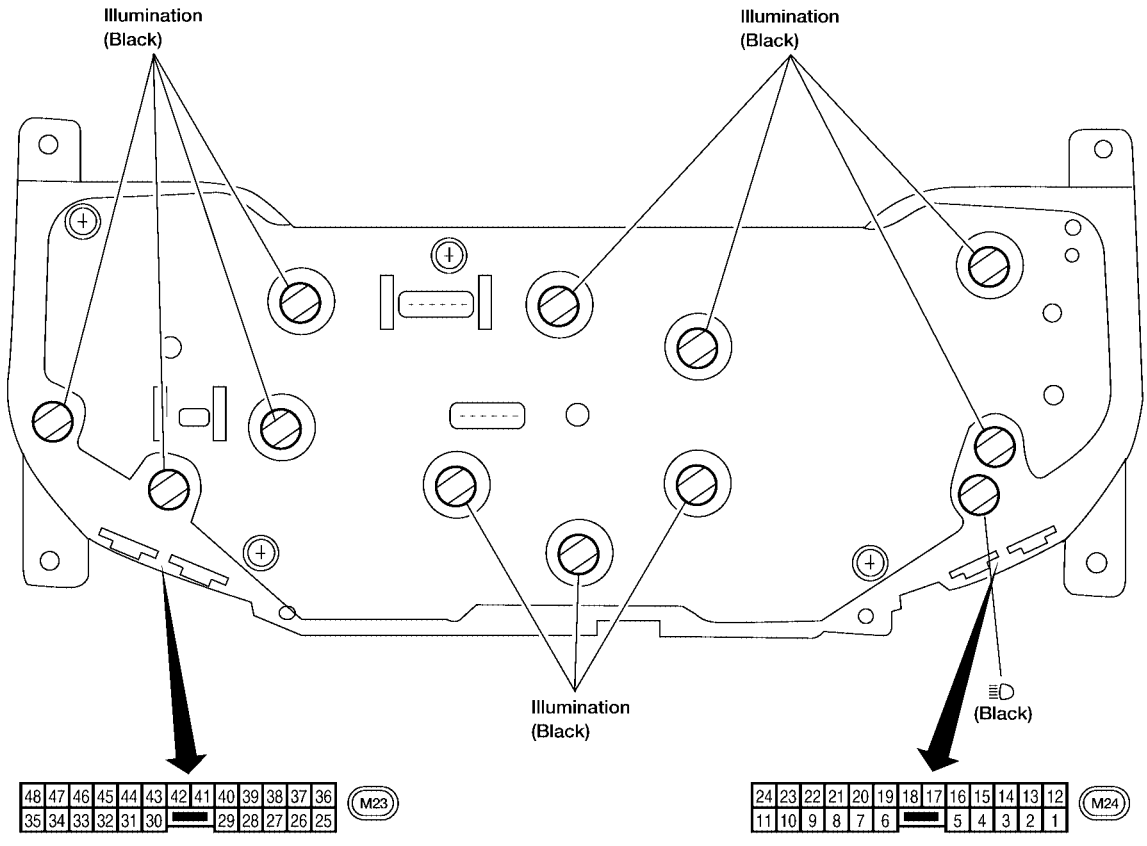
Signals	ECM	COMBINATION METER	BCM	IPDM E/R
High beam status	R		R	T
Front fog lights request			T	R
Front fog light status			R	T
Vehicle speed signal	R	T		
Oil pressure switch		R		T
Sleep request1		R	T	
Sleep request2			T	R
Seat belt buckle switch signal		T	R	
Door switch signal		R	T	R
Tail lamp request		R	T	R
Turn indicator signal		R	T	
Buzzer output signal		R	T	
Trunk switch signal		R	T	
ASCD main switch signal	T	R		
ASCD cruise signal	T	R		
Wiper operation			R	T
Wiper stop position signal			R	T
Rear window defogger switch signal			T	R
Rear window defogger control signal	R		R	T

Combination Meter

EKS002GY

CHECK





Bulb socket color	Bulb wattage
Black	3.0W

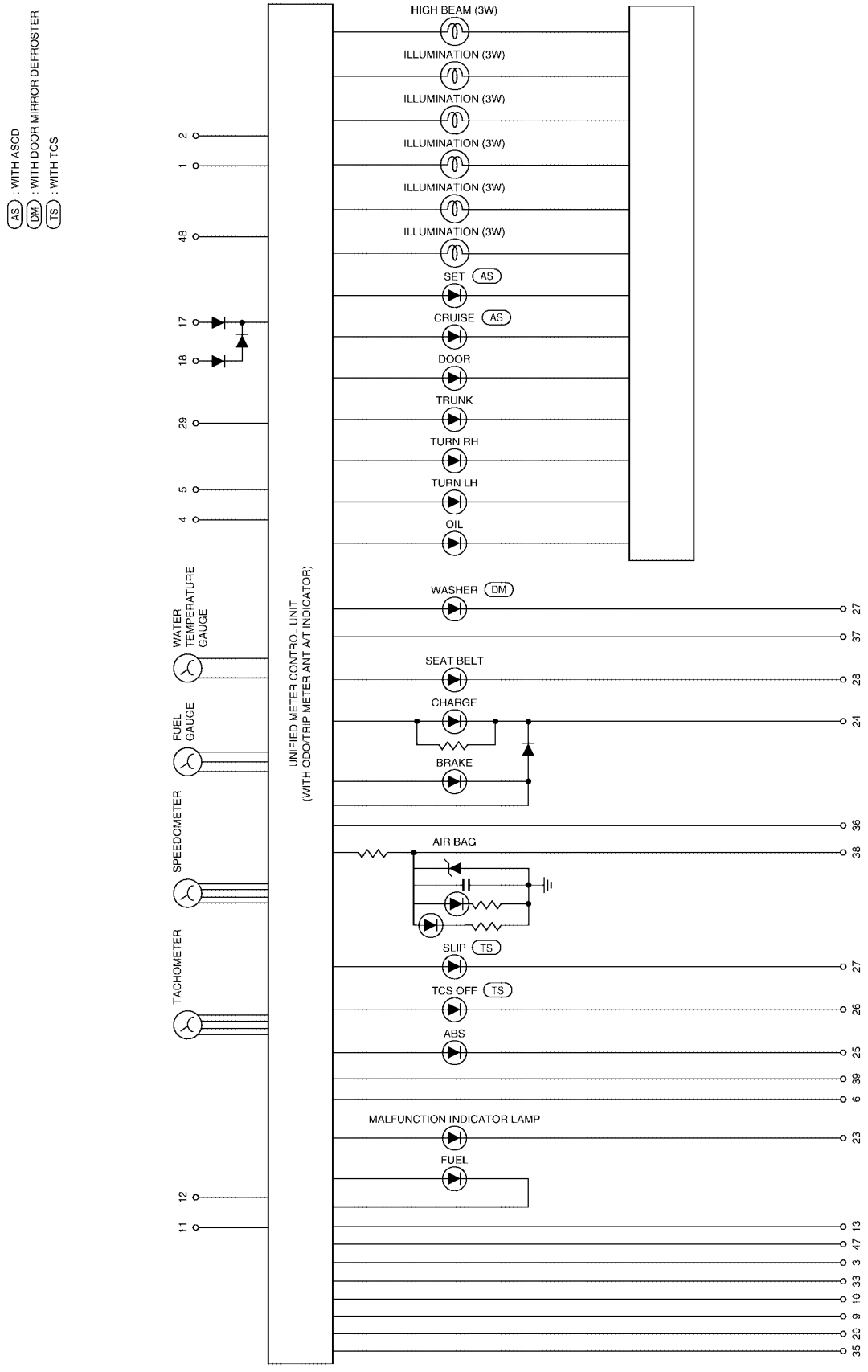
( ): Warning bulb socket color

U : For USA
C : For Canada
TS : With TCS

WKIA0056E

Schematic

EKS002GZ



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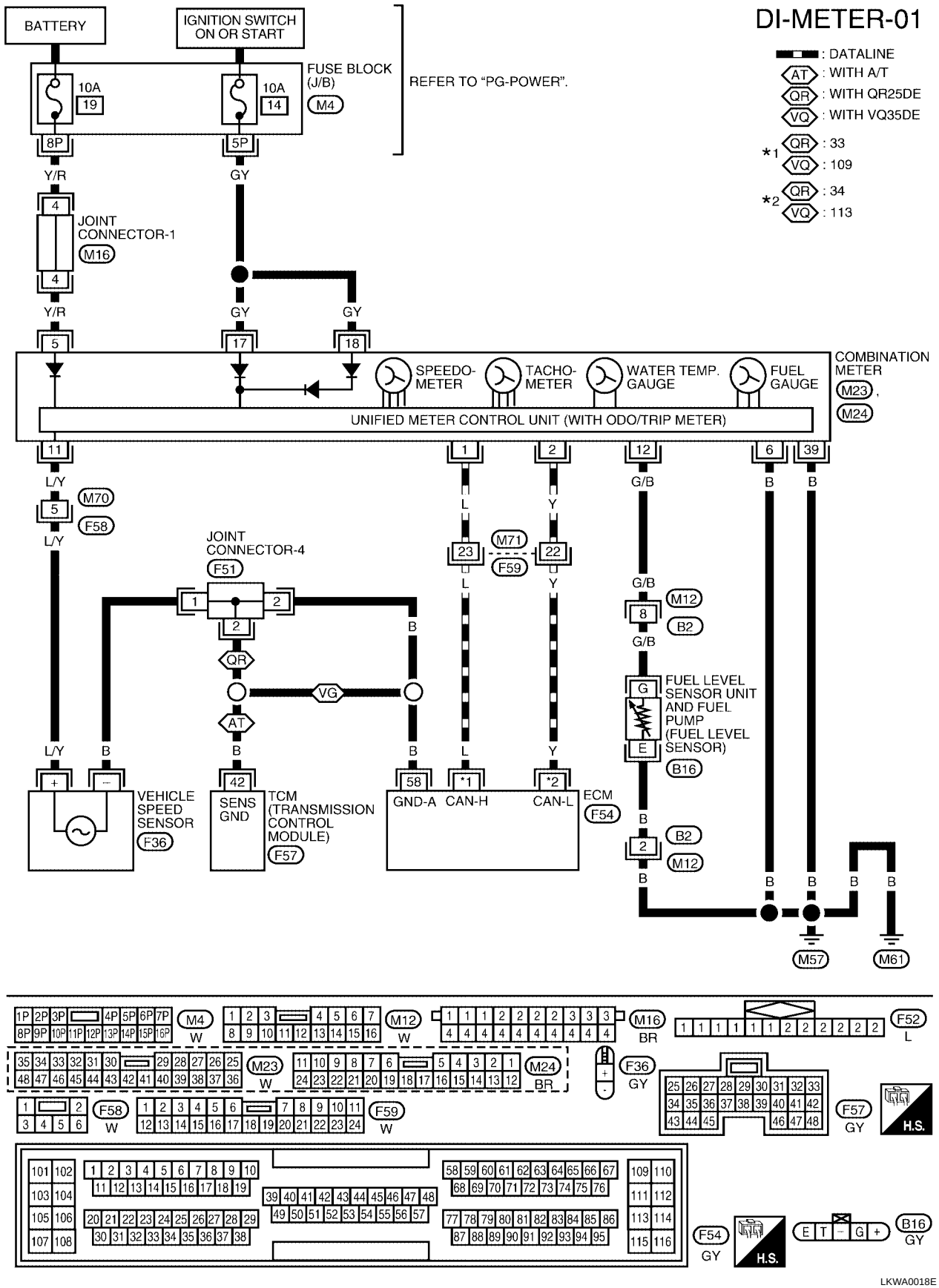
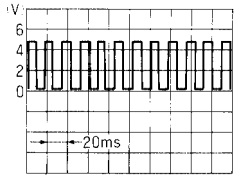
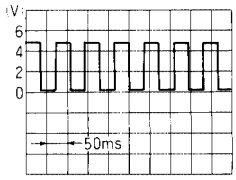
Wiring Diagram — METER —

EKS002H0



Terminals and Reference Value for Combination Meter

EKS002H1

TERMINAL	WIRE COLOR	ITEM	CONDITION		Voltage (V)
			Ignition switch	Operation or condition	
1	L	CAN-H	—	—	—
2	Y	CAN-L	—	—	—
5	Y/R	Battery power supply	OFF	—	Approx. 12V
6	B	Ground	ON	—	Approx. 0V
9	L/Y	Vehicle speed signal (8-pulse)	ON	Speedometer operated [When vehicle speed is approx. 40 km/h (25 MPH)]	 ELF1084D
10	L/Y	Vehicle speed signal (2-pulse)	ON	Speedometer operated [When vehicle speed is approx. 40 km/h (25 MPH)]	 ELF1080D
11	L/Y	Vehicle speed signal	ON	Speedometer operated [When vehicle speed is approx. 20 km/h (12 MPH)]	Approx. 240 Hz
12	G/B	Fuel level sensor signal	ON	—	Refer to DI-21, "FUEL LEVEL SENSOR UNIT CHECK" .
17	GY	Ignition switch ON or START	ON	—	Approx. 12V
18	GY	Ignition switch ON or START	ON	—	Approx. 12V
20	B	Fuel level sensor ground	ON	—	Approx. 0V
35	B	Ground	ON	—	Approx. 0V
39	B	Ground	ON	—	Approx. 0V

Meter/Gauges Operation and Odo/Trip Meter

EKS002H2

SELF–DIAGNOSIS FUNCTION

- Odo/trip meter (board computer) segment operation can be checked in self-diagnosis mode.
- Meters/gauges can be checked in self-diagnosis mode.

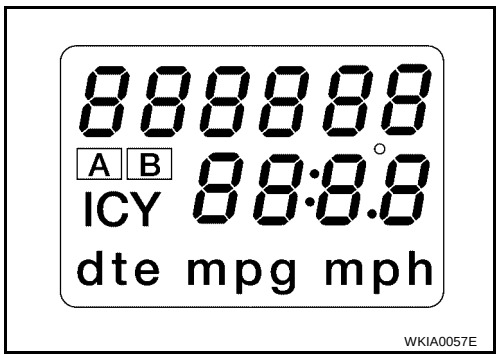
HOW TO ALTERNATE DIAGNOSIS MODE

1. Turn the ignition switch ON, and switch the odometer/trip meter to “trip A” or “trip B”.

   NOTE:
   If the diagnosis function is activated with the trip meter A displayed, the mileage on the tripmeter A will indicate 000.0 miles, but the actual trip mileage will be retained. (Trip B operates the same way).
2. Turn the ignition switch OFF.
3. While pushing the odo/trip meter switch, turn the ignition switch ON again.
4. Check that the tripmeter displays "000.0".
5. Push the odo/trip meter switch at least 7 times within 7 seconds.

6. All the segments on the odo/trip meter illuminate, and simultaneously the low-fuel warning lamp indicator illuminates. At this time, the unified meter control unit is turned to diagnosis mode.

   NOTE:
   If any of the segments is not displayed, replace the combination meter.



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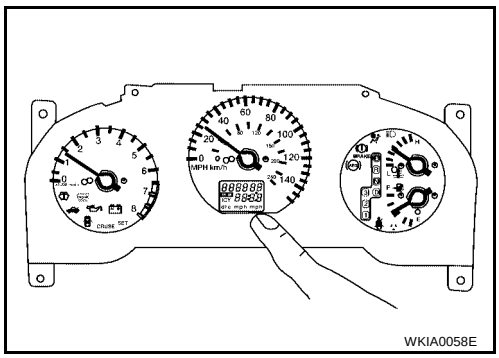
7. Push the odo/trip meter switch. Each meter/gauge should indicate as shown in the figure while pushing odo/trip meter switch. (at this time, the low-fuel warning lamp goes off).


WKIA0058E

How to Proceed With Trouble Diagnosis

EKS002H3

1. Confirm the trouble symptom or customer complaint.
2. Perform diagnosis according to diagnosis flow. Refer to DI-14, "Diagnosis Flow" .
3. According to the trouble diagnosis chart, repair or replace the cause of the trouble symptom. Refer to DI-16, "Trouble Diagnosis Chart by Symptom" .
4. Does the meter operate normally? Yes: Go to 5. No: Go to 2.
5. INSPECTION END.

Diagnosis Flow

EKS002H4

1. WARNING LAMP ILLUMINATION INSPECTION

1. Turn the ignition switch ON.
2. Check that warning lamps (such as MIL and oil pressure warning lamp) illuminate.

Do warning lamps illuminate?

Yes >> GO TO 2.
No >> Check ignition power supply system of combination meter. Refer to DI-15, "Power Supply and Ground Circuit Check" .

2. SELF-DIAGNOSIS OPERATION CHECK

Perform combination meter self-diagnosis. Refer to DI-13, "SELF–DIAGNOSIS FUNCTION" .

Does self-diagnosis function operate?

Yes >> GO TO 3.
No >> Check battery power supply of combination meter and ground system. Refer to DI-15, "Power Supply and Ground Circuit Check" .

3. ODO/TRIP METER OPERATION CHECK

Check segment display status of odo/trip meter. Refer to DI-13, "SELF–DIAGNOSIS FUNCTION" .

Is the display normal?

Yes >> GO TO 4.
No >> Replace the combination meter.

4. FUEL WARNING LAMP ILLUMINATION CONFIRMATION

During fuel warning lamp check, confirm illumination of fuel warning lamp. Refer to DI-13, "SELF–DIAGNOSIS FUNCTION" .

Does fuel warning lamp illuminate?

Yes >> GO TO 5.
No >> Replace the combination meter.

5. METER CIRCUIT CHECK

During meter circuit check, confirm meter illumination. Refer to DI-13, "SELF–DIAGNOSIS FUNCTION" .

Is the display normal?

Yes >> Go to diagnosis results. Refer to DI-16, "DIAGNOSIS RESULTS" .
No >> Replace the combination meter.

Power Supply and Ground Circuit Check

EKS002H5

1. CHECK FUSES

- Check for blown combination meter fuses.

Unit	Power source	Fuse No.
Combination meter	Battery	5
	Ignition switch ON or START	17
	Ignition switch ON or START	18

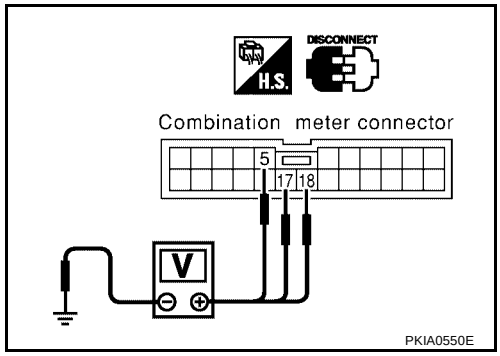
OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of problem before installing new fuse. Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .

2. POWER SUPPLY CIRCUIT CHECK

1. Disconnect the combination meter connector.
2. Check voltage between combination meter harness connectors M24 terminal 5 (Y/R), 17 (GY), 18 (GY) and ground.

Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M24	5 (Y/R)	Ground	Battery voltage	Battery voltage	Battery voltage
M24	17 (GY)		0V	0V	Battery voltage
M24	18 (GY)		0V	0V	Battery voltage



OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between combination meter and fuse.

3. GROUND CIRCUIT CHECK

Check continuity between combination meter harness connector terminal 6 (B), 12 (B), 39 (B) and ground.

Terminals			Continuity
(+)		(–)	
Connector	Terminal (Wire color)		

M23	6 (B)	Ground	Yes
	12 (B)		
M24	39 (B)		

OK or NG

OK >> INSPECTION END.
NG >> Check ground harness.

Trouble Diagnosis Chart by Symptom

EKS002H6

DIAGNOSIS RESULTS

Trouble phenomenon	Inspection contents		Possible cause
Fuel warning lamp indication is irregular.	Inspect the sensor system of the gauge (warning lamp) with the irregular indication.	NG	● Refer to DI-16, "Fuel System" . ● Refer to DI-17, "Tachometer System" . ● Refer to DI-18, "Engine Coolant Temperature System" .
Indication is not normal for one of the following: tachometer, fuel gauge, or water temperature gauge		OK	Combination meter
Indication is irregular for the speedometer and odo/trip meter.	Inspect the vehicle speed input signal.	NG	Refer to DI-19, "Vehicle Speed System" .
		OK	Combination meter
Indications are irregular for more than one gauge.	—		Combination meter
A/T position indication (other than P or N) is not normal.	—		Refer to DI-19, "Position Indication System (Position Other Than P/N)" .

Fuel System

EKS002H7

The following symptoms do not indicate a malfunction.

FUEL GAUGE

- Depending on vehicle position or driving circumstance, the fuel in the tank flows and the pointer may fluctuate.
- If the vehicle is fueled with the ignition switch ON, the pointer will move slowly.

LOW-FUEL WARNING LAMP

Depending on vehicle position or driving circumstance, the fuel in the tank flows and the warning lamp ON timing may change.

1. CONNECTOR INSPECTION

1. Turn the ignition switch OFF.
2. Check meter, fuel level sensor unit and terminals (meter-side, unit-side, harness-side) for looseness or bent terminals.

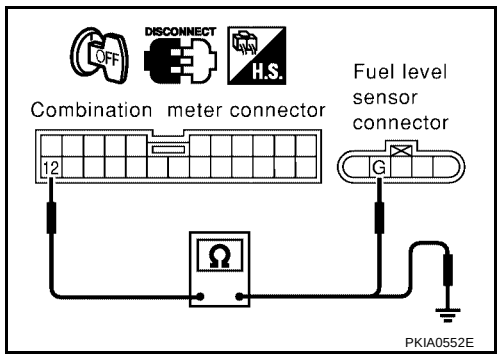
OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CONTINUITY INSPECTION BETWEEN COMBINATION METER AND FUEL LEVEL SENSOR UNIT

1. Disconnect combination meter connector and fuel level sensor unit connector.
2. Check continuity (open circuit) between combination meter harness connector M24 terminal 12 (G/B) and fuel level sensor unit harness connector B16 terminal G (B).
3. Check continuity (short circuit) between combination meter harness connector M24 terminal 12 (G/B) and ground.

12 - G : Continuity should exist.
12 - Ground : Continuity should not exist.



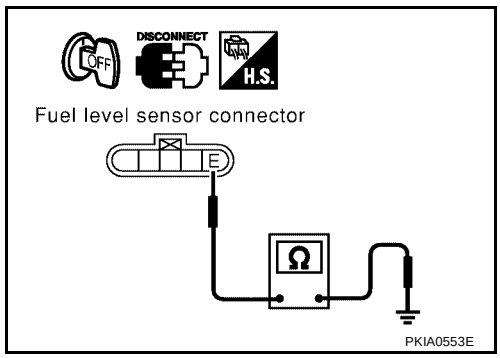
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. GROUND CIRCUIT INSPECTION OF FUEL LEVEL SENSOR

- Check continuity (open circuit) between fuel level sensor unit harness connector B16 terminal E (B) and ground.

E - Ground : Continuity should exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. FUEL LEVEL SENSOR INSPECTION

Check components. Refer to DI-21, "FUEL LEVEL SENSOR UNIT CHECK" .

OK or NG

OK >> GO TO 5.
NG >> Replace fuel level sensor unit.

5. CHECK INSTALLATION CONDITION

Check fuel level sensor unit installation, and check whether the float arm interferes or binds with any of the internal components in the fuel tank.

OK or NG

OK >> Replace the combination meter.
NG >> Install the fuel level sensor unit properly.

Tachometer System

EKS002H8

1. VISUAL INSPECTION

Check if tachometer fluctuates when the engine starts.

Is the fluctuation acceptable?

Yes >> GO TO 2.
No >> GO TO 3.

2. ENGINE SPEED INSPECTION

Compare the values indicated in the engine speed and tachometer.

Does the engine speed correspond to the speed indicated?

Yes >> Condition is normal.
No >> Replace the combination meter.

3. ECM SYSTEM INSPECTION

Perform ECM self-diagnosis. Refer to EC-106, "CONSULT-II Function" (QR25DE) or EC-729, "CONSULT-II Function" (VQ35DE).

OK or NG

OK >> GO TO 3.
NG >> Go to ECM trouble diagnosis.

4. SELF-DIAGNOSIS INSPECTION

Perform combination meter self-diagnosis. Refer to DI-13, "SELF–DIAGNOSIS FUNCTION" .

OK or NG

OK >> Condition is normal.
NG >> Replace the combination meter.

Engine Coolant Temperature System

EKS002H9

1. CONNECTOR INSPECTION

1. Turn the ignition switch OFF.
2. Check terminals (meter-side, control unit-side, and harness-side) on the meter and ECM for disconnection and bend.

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. ECM SYSTEM INSPECTION

- Perform ECM self-diagnosis. Refer to EC-106, "CONSULT-II Function" (QR25DE) or EC-729, "CONSULT-II Function" (VQ35DE).

OK or NG

OK >> GO TO 3.
NG >> Go to ECM trouble diagnosis.

3. SELF-DIAGNOSIS INSPECTION

- Perform combination meter self-diagnosis. Refer to DI-13, "SELF–DIAGNOSIS FUNCTION" .

OK or NG

OK >> Condition is normal.
NG >> Replace the combination meter.

Inspection/Water Temperature Gauge

EKS002HA

1. ECM INSPECTION

Preform the ECM self-diagnosis. Refer to EC-106, "CONSULT-II Function" (QR25DE) or EC-729, "CONSULT-II Function" (VQ35DE).

OK or NG

OK >> GO TO 3.
NG >> Go to ECM trouble diagnosis.

2. SELF-DIAGNOSIS INSPECTION

Perform combination meter self-diagnosis. Refer to DI-13, "SELF–DIAGNOSIS FUNCTION" .

OK or NG

OK >> The combination meter is OK.
NG >> Replace combination meter.

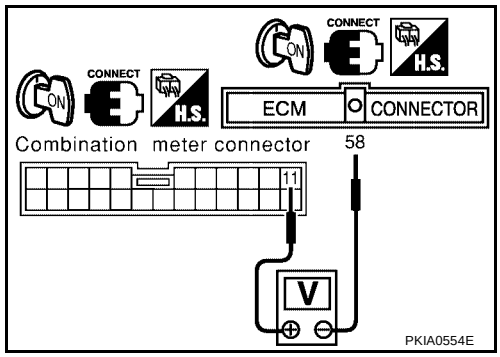
Vehicle Speed System

EKS002HB

1. CHECK VEHICLE SPEED SENSOR

1. Remove vehicle speed sensor.
2. Check voltage between combination meter harness connector M24 terminal 11 (L/Y) and ECM harness connector F54 terminal 58 (B).

11 - 58 : Approx. 0.5V



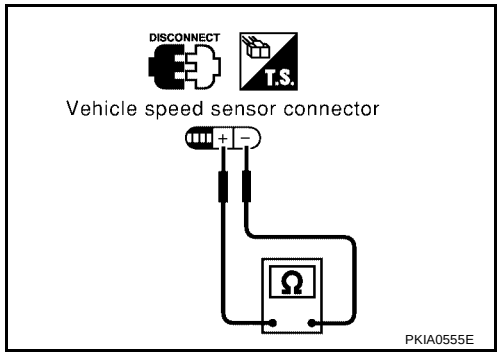
OK or NG

OK >> Vehicle speed sensor is OK.
NG >> GO TO 2.

2. CHECK VEHICLE SPEED SENSOR

Check resistance between vehicle speed sensor terminals + and -.

+ - – : Approx. 250Ω



OK or NG

OK >> Check harness or connector between combination meter, vehicle speed sensor and ECM.
NG >> Replace vehicle speed sensor.

Position Indication System (Position Other Than P/N)

EKS002HC

1. TCM INSPECTION

Perform TCM self-diagnosis. Refer to AT-41, "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)" .

OK or NG

OK >> GO TO 2.
NG >> Go to TCM trouble diagnosis.

2. SELF-DIAGNOSIS INSPECTION

Perform combination meter self-diagnosis. Refer to DI-13, "SELF–DIAGNOSIS FUNCTION" .

OK or NG

OK >> Condition is normal.
NG >> Replace the combination meter.

The Fuel Gauge Pointer Fluctuates, Indicator Wrong Value Or Varies

EKS002HD

1. CHECK FUEL GAUGE FLUCTUATION

Test drive vehicle to see if gauge fluctuates only during driving or before or after stopping.

Does the indication value vary only during driving or before or after stopping?

Yes >> The pointer fluctuation may be caused by fuel level change in the fuel tank. Condition is normal.
No >> Ask the customer about the situation when the symptom occurs in detail, and perform the trouble diagnosis.

The Fuel Gauge Does Not Move to F- position

EKS002HE

1. QUESTIONNAIRE 1

Does it take a long time for the pointer to move to F- position?

Yes or No

Yes >> GO TO 2.
No >> GO TO 3.

2. QUESTIONNAIRE 2

Was the vehicle fueled with the ignition switch ON?

Yes or No

Yes >> Be sure to fuel the vehicle with the ignition switch OFF. Otherwise, it will take a long time to move to F- position because of the characteristic of the fuel gauge.
No >> GO TO 3.

3. QUESTIONNAIRE 3

Is the vehicle parked on an incline?

Yes or No

Yes >> Check the fuel level indication with vehicle on a level surface.
No >> GO TO 4.

4. QUESTIONNAIRE 4

During driving, does the fuel gauge pointer move gradually toward E - position?

Yes or No

Yes >> Check the components. Refer to DI-21, "FUEL LEVEL SENSOR UNIT CHECK" .
No >> The float arm may interfere or bind with any of the components in the fuel tank.

The Fuel Gauge Does Not Work

EKS002HF

1. HARNESS CONNECTOR INSPECTION

1. Turn the ignition switch OFF.
2. Check combination meter, fuel level sensor unit, and terminals (meter-side, module-side, lead-side, and harness-side) for poor connection and bend.

OK or NG

OK >> GO TO 2.
NG >> Repair terminal or connector.

2. CHECK INSTALLATION CONDITION

Check fuel level sensor unit installation (refer to FL-5, "FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY" , and check whether the float arm interferes or binds with any components inside the fuel tank.

OK or NG

OK >> Fuel level sensor unit is OK.
NG >> Check fuel level sensor unit. Refer to DI-21, "FUEL LEVEL SENSOR UNIT CHECK" .

Low Fuel Warning Lamp Illuminates at All Times or Does Not Illuminate

EKS002HG

1. SELF-DIAGNOSIS INSPECTION

Perform combination meter self-diagnosis. Refer to DI-13, "SELF–DIAGNOSIS FUNCTION" .

OK or NG

OK >> Check fuel level sensor unit. Refer to DI-21, "FUEL LEVEL SENSOR UNIT CHECK" .
NG >> Replace combination meter.

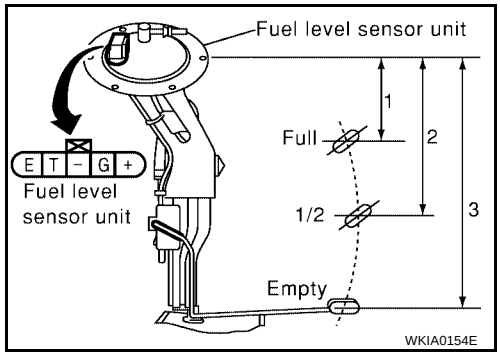
Electrical Components Inspection

EKS002HH

FUEL LEVEL SENSOR UNIT CHECK

- For removal, refer to FL-5, "Removal and Installation" .
- Check the resistance between terminals G and E.

Measurement terminal		Float position mm (in)		Resistance value (Approx.)
G	E	Full (1)	82.7 (3.3)	4.5 – 5.5Ω
		1/2 (2)	200.3 (7.9)	31.5 – 5.5Ω
		Empty (3)	325.0 (12.8)	80.0 – 83.0Ω



Removal and Installation

EKS002HI

For removal and installation procedure, refer to IP-14, "Combination Meter" .

WARNING LAMPS

PFP:24814

System Description

EKS002HJ

OUTLINE

With ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to combination meter terminals 17 and 18.

Ground is supplied

- to combination meter terminals 6 and 39
- through body grounds M57 and M61, and
- to seat belt buckle switch terminal 2
- through body grounds B7 and B19, and
- to brake fluid level switch terminal 1
- through body grounds E15 and E24, and
- to washer level switch terminal +
- through body grounds E115 and E129.

MALFUNCTION INDICATOR LAMP

During prove out or when an engine control malfunction occurs, ground is supplied

- to combination meter terminal 23
- from ECM terminal 18 (QR25DE engines) or terminal 33 (VQ35DE engines).

When power and ground are supplied, the malfunction indicator lamp illuminates.

LOW WASHER FLUID LEVEL WARNING LAMP

When the washer fluid level is low, ground is supplied

- to combination meter terminal 22
- from washer fluid level switch terminal +.

When power and ground are supplied, the low washer level warning lamp illuminates.

AIR BAG WARNING LAMP

During prove out or when an air bag malfunction occurs, the ground path is interrupted

- from the air bag diagnosis sensor unit terminal 15
- to combination meter terminal 38.

Ground is supplied

- through combination meter terminals 6 and 39.

When power and ground are supplied, the air bag warning lamp illuminates.

SEAT BELT WARNING LAMP

When the driver's seat belt is unfastened, ground is supplied

- to combination meter terminal 28
- from seat belt buckle switch terminal 1.

When power and ground are supplied, the seat belt warning lamp illuminates.

LOW FUEL LEVEL WARNING LAMP

The amount of fuel in the fuel tank is determined by the fuel level sensor in the fuel tank. A signal is sent

- to combination meter terminal 12
- from fuel level sensor unit terminal G.

The fuel level sensor will illuminate the low fuel level warning lamp when the fuel level is low.
When power and ground are supplied, the low fuel level warning lamp illuminates.

CHARGE WARNING LAMP

During prove out or when a alternator malfunction occurs, ground is supplied

- to combination meter terminal 24
- from generator terminal L.

When power and ground are supplied, the charge warning lamp and brake lamp illuminate.

BRAKE WARNING LAMP

When the parking brake is applied, or if the brake fluid level is low, ground is supplied

- to combination meter terminal 36
- from parking brake switch terminal 1, or
- to combination meter terminal 37
- from brake fluid level switch terminal 1.

When power and ground are supplied, the brake warning lamp illuminates.

LOW OIL PRESSURE WARNING LAMP

Low oil pressure warning lamp is controlled by the IPDM E/R (Intelligent Power Distribution Module Engine Room).
Low oil pressure causes oil pressure switch terminal + to provide ground to IPDM E/R terminal 50. The IPDM E/R then signals the combination meter (unified meter control unit) via the CAN lines and ground is provided to the low oil pressure warning lamp.
When power and ground are supplied, the low oil pressure warning lamp illuminates.

DOOR WARNING LAMP

Door warning lamp is controlled by the BCM.
When one of the doors is opened, ground is supplied to the BCM terminals 10, 11, 14 or 54. The BCM then signals the combination meter (unified meter control unit) via the CAN lines and ground is provided to the door warning lamp.
When power and ground are supplied, the door warning lamp illuminates.

TRUNK WARNING LAMP

Trunk warning lamp is controlled by the BCM.
When the trunk is open, ground is supplied

- to BCM terminal 19
- through body grounds B7 and B19.

The BCM then signals the combination meter (unified meter control unit) via the CAN lines and ground is provided to the trunk warning lamp.
When power and ground are supplied, the trunk warning lamp illuminates.

ASCD SET INDICATOR LAMP

The ASCD set indicator lamp is controlled by the ECM.
When the ASCD system is turned on and the speed is set, the ECM signals the combination meter (unified meter control unit) via the CAN lines and ground is provided to the set indicator lamp.
When power and ground are supplied, the set indicator lamp illuminates.

CRUISE INDICATOR LAMP

The cruise indicator lamp is controlled by the ECM.
When the ASCD system is turned on, the ECM signals the combination meter (unified meter control unit) via the CAN lines and ground is provided to the cruise indicator lamp.
When power and ground are supplied, the cruise indicator lamp illuminates.

ABS WARNING LAMP

When an ABS malfunction occurs, ground is supplied

- to combination meter terminal 25
- from ABS actuator and electric unit (control unit) terminal 21.

When power and ground are supplied, the ABS warning lamp illuminates.

TCS OFF WARNING LAMP

When TCS OFF switch is in OFF position, or an TCS malfunction occurs, ground is supplied

- to combination meter terminal 26
- from ABS actuator and electric unit (control unit) terminal 26.

When power and ground are supplied, the TCS OFF warning lamp illuminates.

SLIP WARNING LAMP

When TCS is in operation, or a TCS malfunction occurs, ground is supplied

- to combination meter terminal 27
- from ABS actuator and electric unit (control unit) terminal 28.

When power and ground are supplied, the slip warning lamp illuminates.

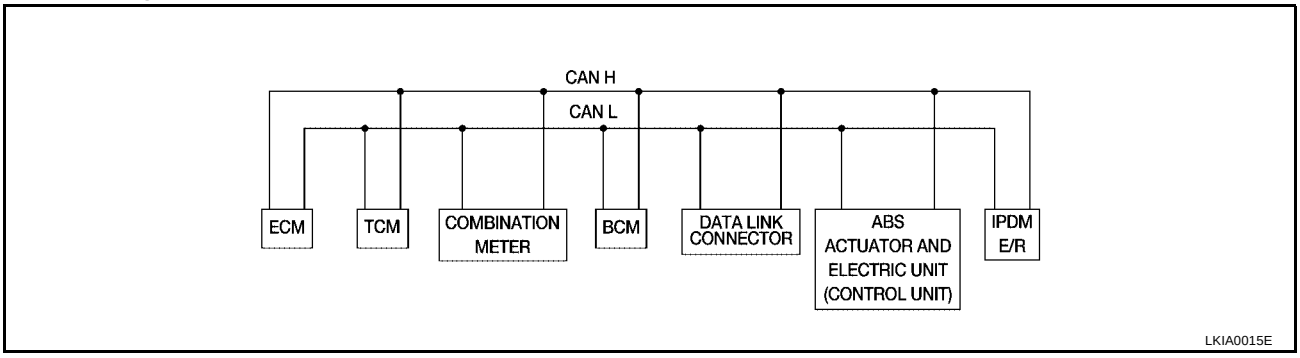
CAN Communication System Description

EKS002HK

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

FOR TCS MODELS

System Diagram



Input/Output Signal Chart

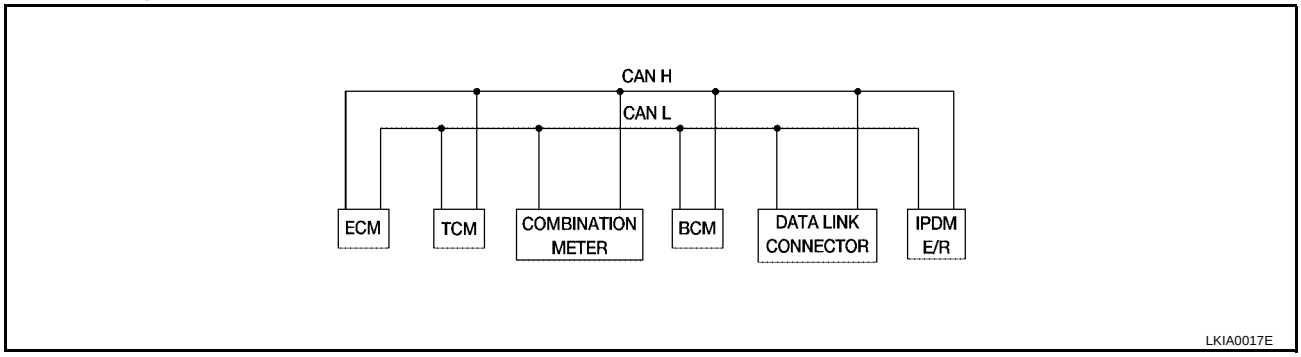
T: Transmit R: Receive

Signals	ECM	TCM	COMBINATION METER	BCM	ABS/TCS control unit	IPDM E/R
Engine speed signal	T		R		R	
Engine coolant temperature signal	T		R			
Accelerator pedal position signal	T					
Fuel consumption monitor signal	T		R			
A/T warning lamp signal		T	R			
A/T position indicator signal	R	T	R	R(R range only)	R	
ABS operation signal	R				T	
TCS operation signal	R	R			T	
Air conditioner switch signal	R			T		
Air conditioner compressor signal	R					T
A/C compressor request signal	T					R
Cooling fan motor operation signal	R					T
Cooling fan speed request signal	T					R
Position lights request			R	T		R
Position lights status				R		T
Low beam request				T		R
Low beam status	R			R		T
High beam request			R	T		R
High beam status	R			R		T
Front fog lights request				T		R

Signals	ECM	TCM	COMBINATION METER	BCM	ABS/TCS control unit	IPDM E/R
Front fog light status				R		T
OD cancel switch signal		R	T			R
Brake switch signal		R	T			
Vehicle speed signal	R		T			
	R		T	R		
Oil pressure switch			R			T
Sleep request1			R	T		
Sleep request2				T		R
N range switch signal		R	T			
P range switch signal		R	T			
Seat belt buckle switch signal			T	R		
Door switch signal			R	T		R
Tail lamp request			R	T		R
Turn indicator signal			R	T		
Buzzer output signal			R	T		
Trunk switch signal			R	T		
ASCD main switch signal	T		R			
ASCD cruise signal	T		R			
Wiper operation				R		T
Wiper stop position signal				R		T
Rear window defogger switch signal				T		R
Rear window defogger control signal	R			R		T

FOR A/T MODELS

System Diagram



Input/Output Signal Chart

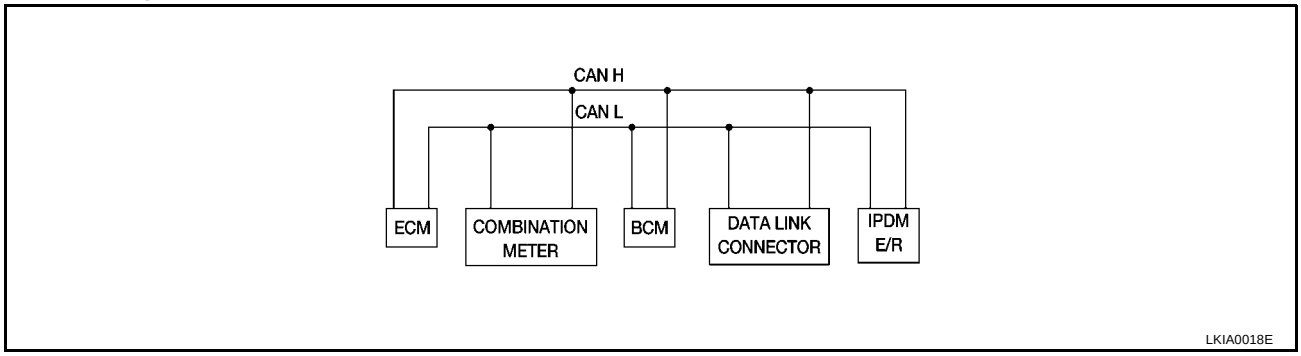
T: Transmit R: Receive

Signals	ECM	TCM	COMBINATION METER	BCM	IPDM E/R
Engine speed signal	T		R		
Engine coolant temperature signal	T		R		
Accelerator pedal position signal	T				R
Fuel consumption monitor signal	T		R		
A/T warning lamp signal		T	R		
A/T position indicator signal	R	T	R	R(R range only)	

Signals	ECM	TCM	COMBINATION METER	BCM	IPDM E/R
Air conditioner switch signal	R			T	
Air conditioner compressor signal	R				T
A/C compressor request signal	T				R
Blower fan switch signal	R(QR25DE)			T	
Cooling fan motor operation signal	R			T	
Cooling fan speed request signal	T				R
Position lights request			R	T	R
Position lights status				R	T
Low beam request				T	R
Low beam status	R			R	T
High beam request			R	T	R
High beam status	R			R	T
Front fog lights request				T	R
Front fog light status				R	T
OD cancel switch signal		R	T		R
Brake switch signal		R	T		
Vehicle speed signal	R		T		
	R		T	R	
Oil pressure switch			R		T
Sleep request1			R	T	
Sleep request2				T	R
N range switch signal		R	T		
P range switch signal		R	T		
Seat belt buckle switch signal			T	R	
Door switch signal			R	T	R
Tail lamp request			R	T	R
Turn indicator signal			R	T	
Buzzer output signal			R	T	
Trunk switch signal			R	T	
ASCD main switch signal	T		R		
ASCD cruise signal	T		R		
Wiper operation				R	T
Wiper stop position signal				R	T
Rear window defogger switch signal				T	R
Rear window defogger control signal	R			R	T

FOR M/T MODELS

System Diagram



Input/Output Signal Chart

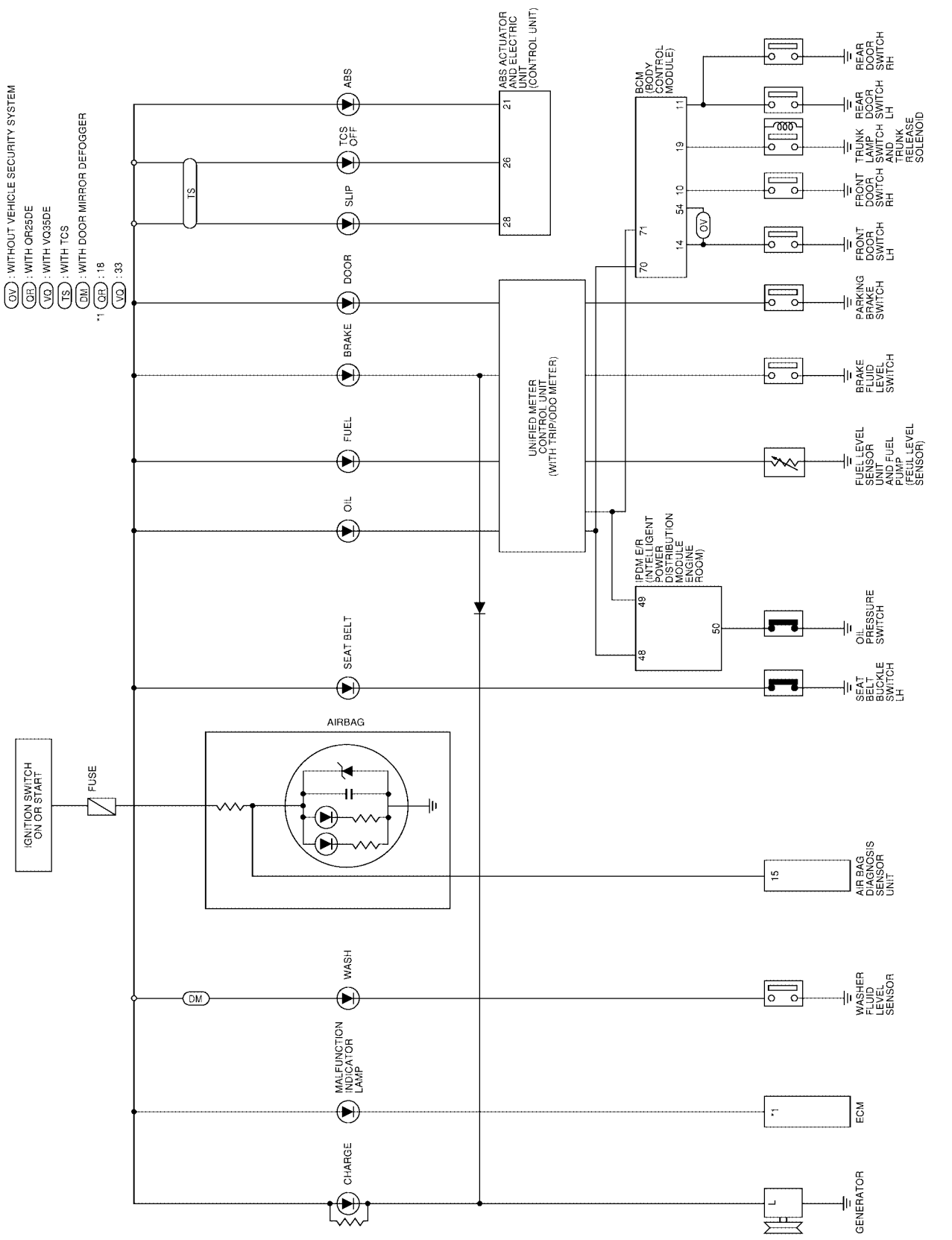
T: Transmit R: Receive

Signals	ECM	COMBINATION METER	BCM	IPDM E/R
Engine speed signal	T			
Engine coolant temperature signal	T			
Fuel consumption monitor signal	T			
Air conditioner switch signal	R		T	
Air conditioner compressor signal	R			T
A/C compressor request signal	T			R
Blower fan switch signal	R(QR25DE)		T	
Cooling fan motor operation signal	R			T
Cooling fan speed request signal	T			R
Position lights request		R	T	R
Position lights status			R	T
Low beam request			T	R
Low beam status	R		R	T
High beam request		R	T	R
High beam status	R		R	T
Front fog lights request			T	R
Front fog light status			R	T
Vehicle speed signal	R	T		
Oil pressure switch		R		T
Sleep request1		R	T	
Sleep request2			T	R
Seat belt buckle switch signal		T	R	
Door switch signal		R	T	R
Tail lamp request		R	T	R
Turn indicator signal		R	T	
Buzzer output signal		R	T	
Trunk switch signal		R	T	
ASCD main switch signal	T	R		
ASCD cruise signal	T	R		
Wiper operation			R	T
Wiper stop position signal			R	T

Signals	ECM	COMBINATION METER	BCM	IPDM E/R
Rear window defogger switch signal			T	R
Rear window defogger control signal	R		R	T

Schematic

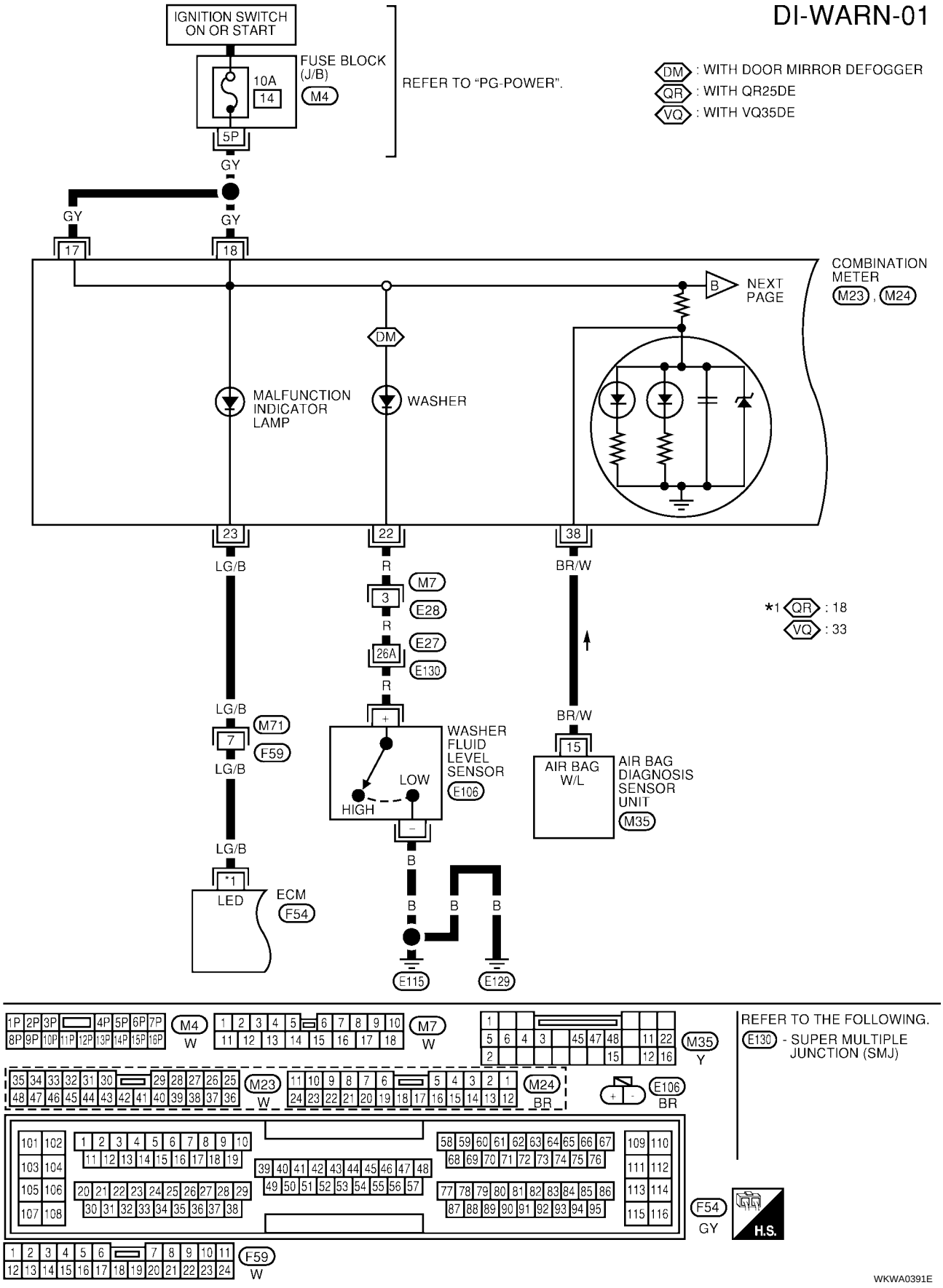
EKS002HL



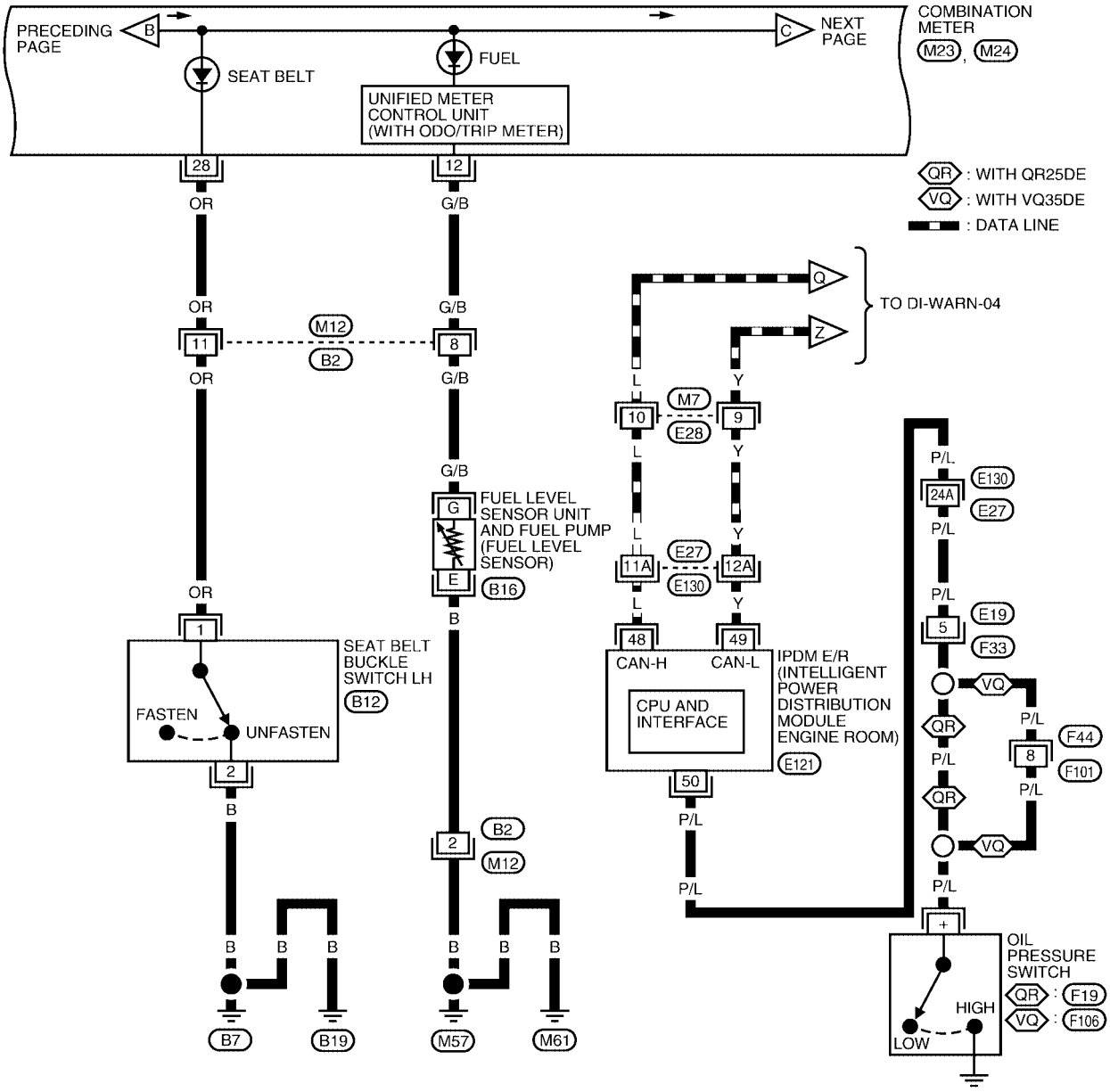
WKWA0390E

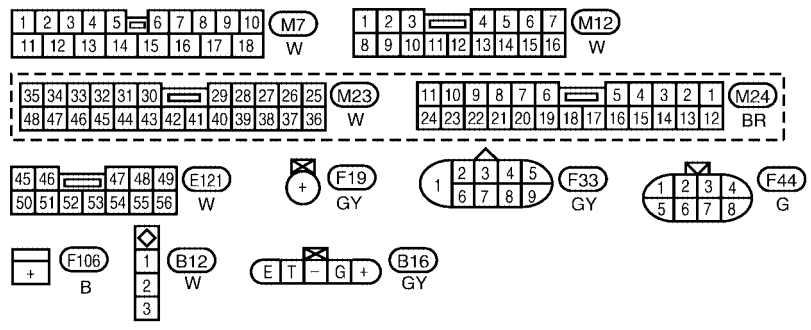
Wiring Diagram — WARN —

EKS002HM



DI-WARN-02

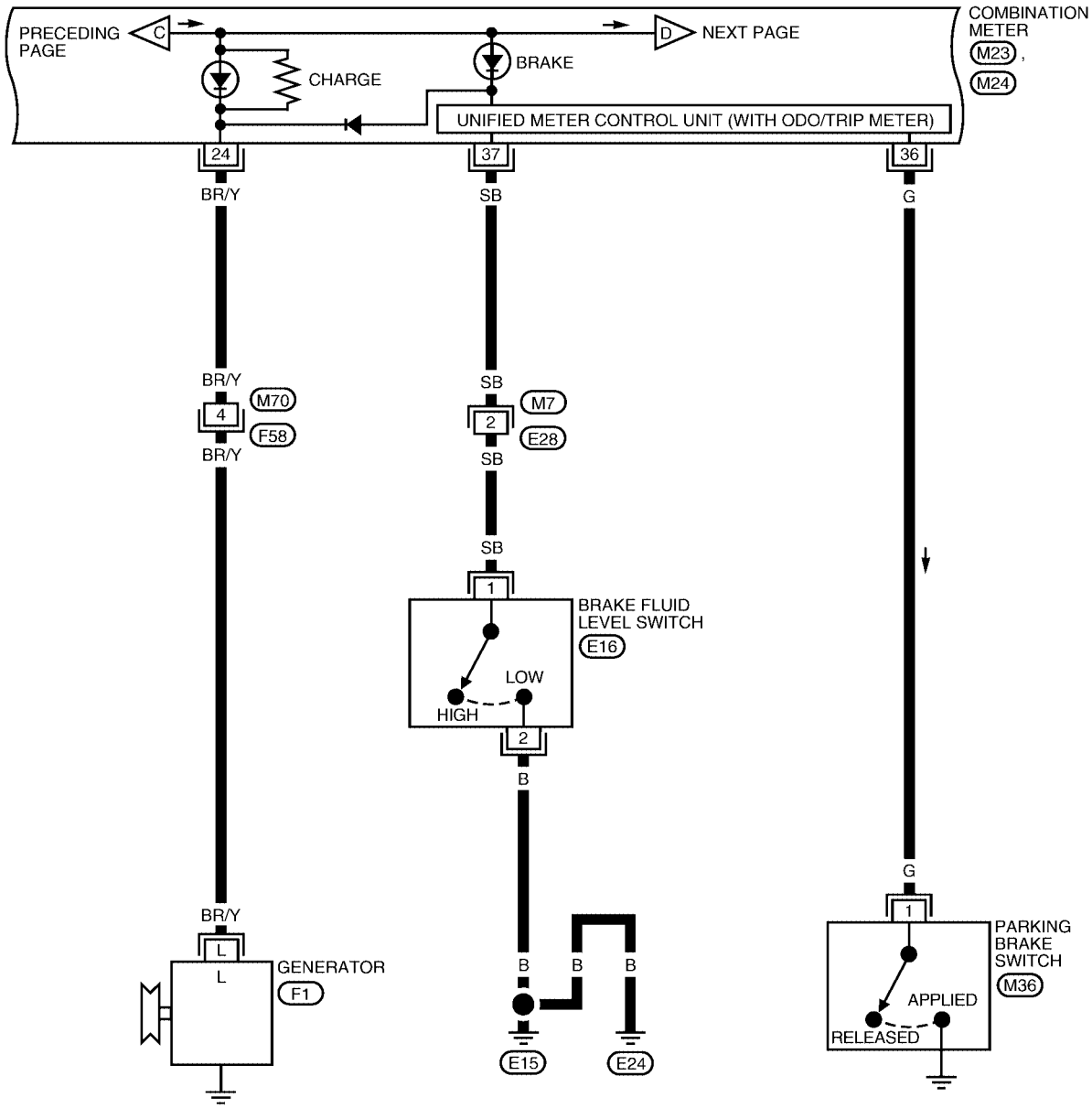


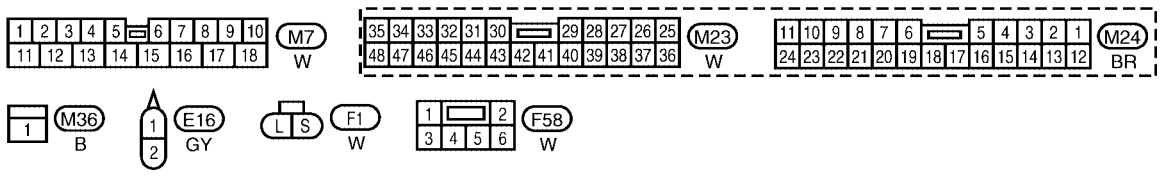


REFER TO THE FOLLOWING.
E130 - SUPER MULTIPLE JUNCTION (SMJ)

LKWA0055E

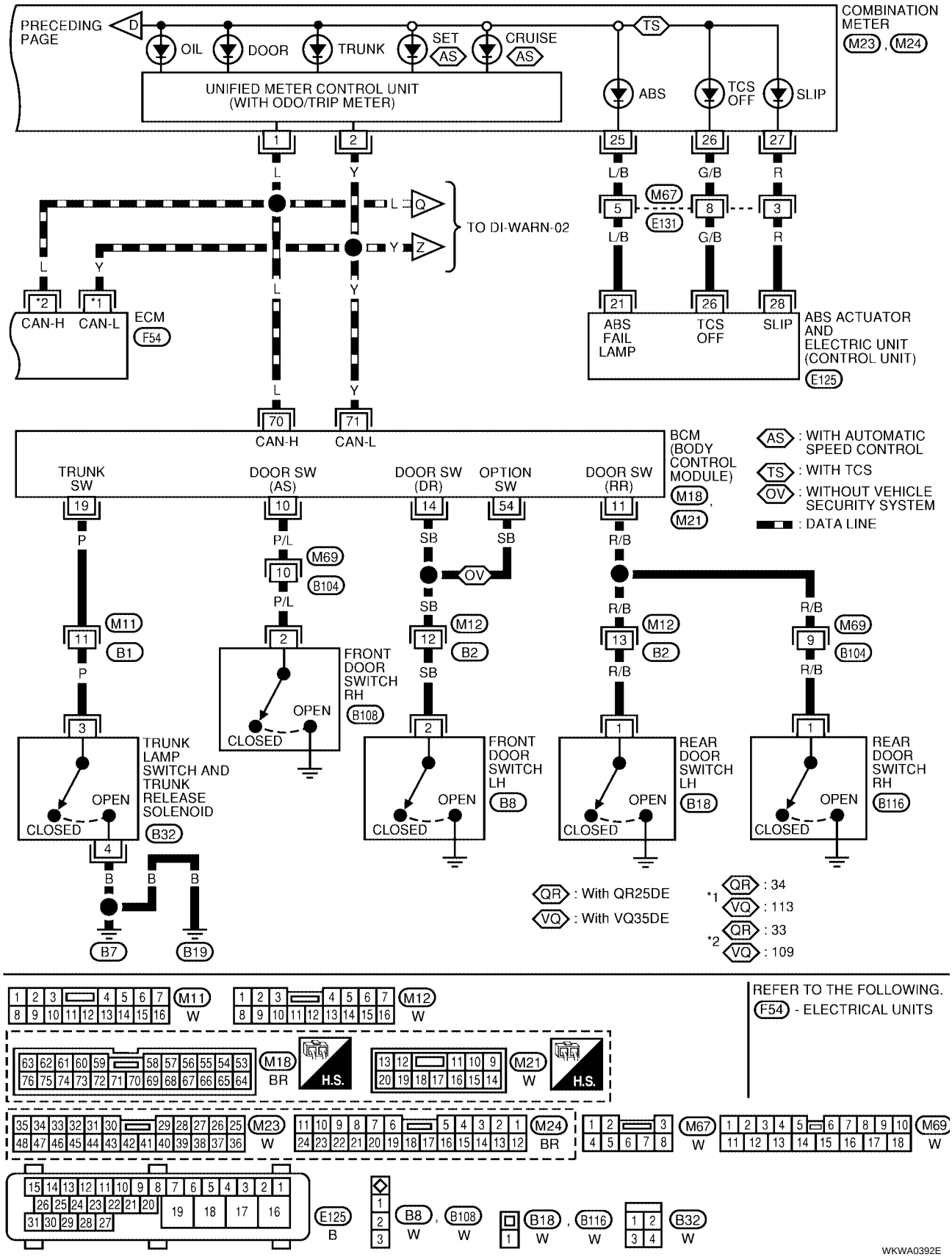
DI-WARN-03





LKWA0056E

DI-WARN-04


PRECEDING PAGE
D
OIL
DOOR
TRUNK
SET
AS
CRUISE
AS
TS
ABS
TCS OFF
SLIP
COMBINATION METER
M23 , M24
UNIFIED METER CONTROL UNIT (WITH ODO/TRIP METER)
TO DI-WARN-02
CAN-H
CAN-L
ECM
F54
ABS FAIL LAMP
TCS OFF
SLIP
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
E125
BCM (BODY CONTROL MODULE)
M18 , M21
TRUNK SW
DOOR SW (AS)
DOOR SW (DR)
OPTION SW
DOOR SW (RR)
AS : WITH AUTOMATIC SPEED CONTROL
TS : WITH TCS
OV : WITHOUT VEHICLE SECURITY SYSTEM
: DATA LINE
FRONT DOOR SWITCH RH
B108
FRONT DOOR SWITCH LH
B8
REAR DOOR SWITCH LH
B18
REAR DOOR SWITCH RH
B116
TRUNK LAMP SWITCH AND TRUNK RELEASE SOLENOID
B32
OPEN
CLOSED
QR : With QR25DE
VQ : With VQ35DE
*1 QR : 34
VQ : 113
*2 QR : 33
VQ : 109
REFER TO THE FOLLOWING.
F54 - ELECTRICAL UNITS
M11
M12
M18
M21
M23
M24
M67
M69
B1
B2
B7
B19
B104
E131
W
BR
H.S.
WKWA0392E

Terminals And Reference Value For BCM

EKS002HN

TERMINAL	WIRE COLOR	ITEM	CONDITION			DATA (DC Voltage) (Approx.)
			IGNITION SWITCH	OPERATION		
10	P/L	Passenger door switch	OFF	Passenger door switch	ON (open)	0
					OFF (closed)	12
11	R/B	Rear door switch(es)	OFF	Rear door switch LH or RH	ON (open)	0
					OFF (closed)	12
14	SB	Driver door switch (with vehicle security system)	OFF	Driver door switch	ON (open)	0
					OFF (closed)	12
19	P	Trunk switch	OFF	Trunk switch	ON (open)	0
					OFF (closed)	12
54	SB	Driver door switch (without vehicle security system)	OFF	Driver door switch	ON (open)	0
					OFF (closed)	12
70	L	CAN H	—			—
71	Y	CAN L	—			—

Work Flow

EKS002HO

1. Check the trouble symptom and customer's requests.
2. Understand the outline of system. Refer to DI-22, "System Description" .
3. Perform the preliminary check. Refer to DI-34, "Preliminary Check" .
4. Referring to Trouble diagnosis chart, repair or replace the cause of the incident. Refer to DI-38, "Trouble Diagnosis For Door Warning Lamp"
5. Does warning chime system operate normally? If it operates normally, go to step 6. If not, go to step 4.
6. INSPECTION END.

Preliminary Check

EKS002HP

INSPECTION FOR POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

- Check for blown BCM fuses.

UNIT	POWER SOURCE	FUSE No.
BCM	Battery	f

Refer to DI-49, "Wiring Diagram — CHIME —" .

OK or NG

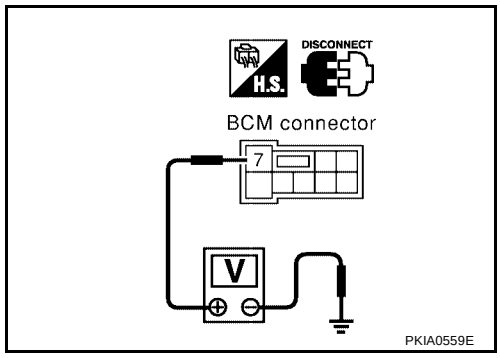
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of problem before installing new fuse. Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .

2. POWER SUPPLY CIRCUIT CHECK

1. Disconnect BCM connector.
2. Check voltage between BCM connector E39 terminal 7 (W/B) and ground.

Terminals			Ignition switch position
(+)		(-)	OFF
Connector	Terminal (Wire color)		
E39	7 (W/B)	Ground	Battery voltage



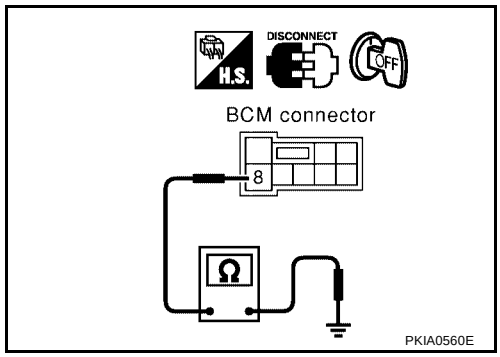
OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3. GROUND CIRCUIT CHECK

Check continuity between BCM harness connector E39 terminal 8 and body ground.

Terminals			Continuity
(+)		(–)	
Connector	Terminal		
E39	8	Ground	Yes



OK or NG

OK >> INSPECTION END.
NG >> Check harness ground circuit.

CONSULT–II Function

EKS002HQ

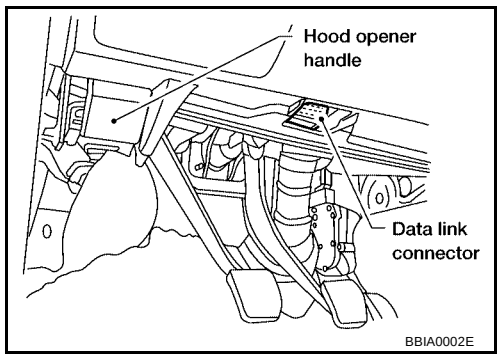
- CONSULT-II executes the following functions by combining data reception and command transmission via the communication line from BCM. CAN system inspection, IVMS work support, self-diagnosis, data monitor, and active test display.

DIAGNOSTIC ITEMS DESCRIPTION

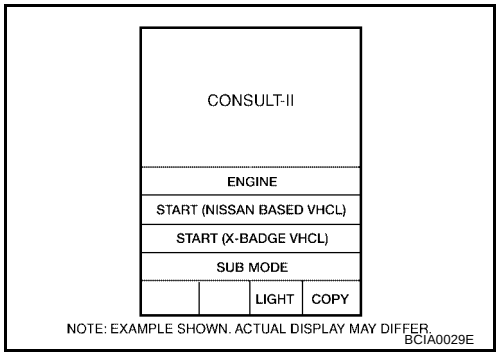
IVMS diagnosis position	Diagnosis mode	Description
DOOR OPEN-WARN	Data monitor	The input data to the BCM control unit is displayed in real time.
	Active test	Operation of electrical loads can be checked by sending driving signal to them.
BCM PART NUMBER		Displays BCM part No.

SELF-DIAGNOSIS PROCEDURE

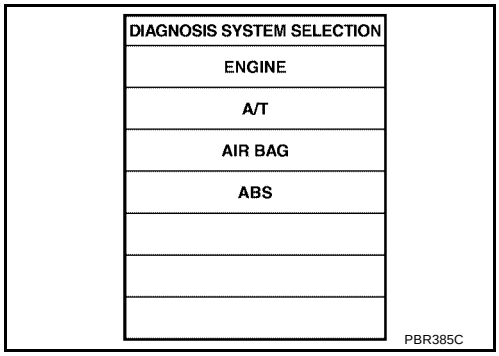
1. With the ignition switch OFF, connect CONSULT-II to the data link connector, and turn the ignition switch ON.



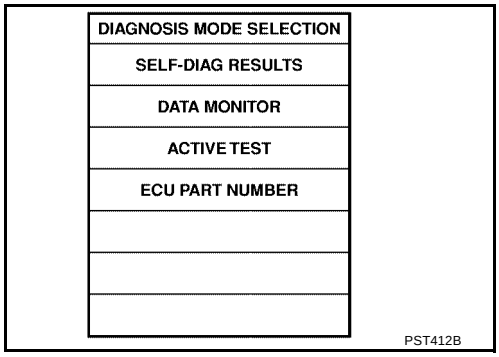
2. Touch “START”.



3. Select the desired part to be diagnosed on the “DIAGNOSIS SYSTEM SELECTION” screen.



4. Touch “SELF-DIAG RESULTS”.
   - The screen shows the detected malfunction and how many times the ignition switch has been turned since the malfunction.
5. Make the necessary repairs following the diagnostic procedures.



6. After the malfunctions are repaired, erase the self-diagnostic results stored in the control unit by touching “ERASE”.

NOTE:
“SELF-DIAG RESULTS” screen shows the detected malfunction and how many times the ignition switch has been turned since the malfunction.

DATA MONITOR

Operation Procedure

1. Touch “DOOR OPEN WARNING” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch “MAIN SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR" screen.

MAIN SIGNALS	Monitors the main items.
SELECTION FROM MENU	Selects and monitors the items.

4. Touch “START”.
5. If “SELECTION FROM MENU” is selected, touch the desired monitor item. If “MAIN SIGNALS” is selected, the main item required to control is monitored.
6. During monitoring, touching “COPY” can start recording the monitor item status.

Data Monitor Item

Monitored item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch.
DOOR SW-DR	Indicates [ON/OFF] condition of front door switch (driver side).
DOOR SW-AS	Indicates [ON/OFF] condition of front door switch (passenger side).
DOOR SW-RL	Indicates [ON/OFF] condition of rear door switch LH.
DOOR SW-RR	Indicates [ON/OFF] condition of rear door switch RH.

ACTIVE TEST

Operation Procedure

1. Touch “DOOR OPEN WARNING” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch the item to be tested, and check the operation.
4. During the operation check, touching “OFF” deactivates the operation.

Active Test Item

Test item	Malfunction detecting condition
DR OPN WARN LAMP	This test is able to check door warning lamp operation. Door warning lamp indicates when to touch “ON” on CONSULT-II screen.

On-Board Diagnosis

EKS002HR

ON BOARD DIAGNOSTIC RESULTS INDICATOR LAMP

- Front map lamps and step lamps (all seats) act as the indicators for the On-Board Diagnosis.

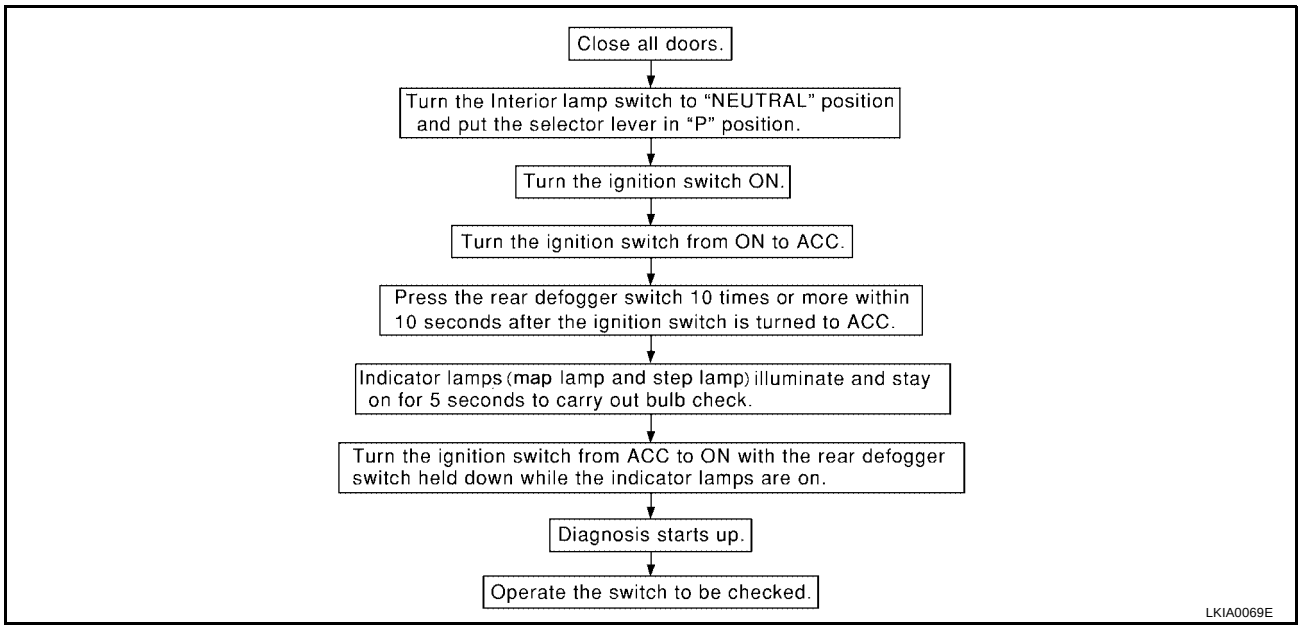
DIAGNOSIS ITEM

Diagnosis item	Description
Switch monitor	Monitoring conditions of switches connected to BCM.

SWITCH MONITOR

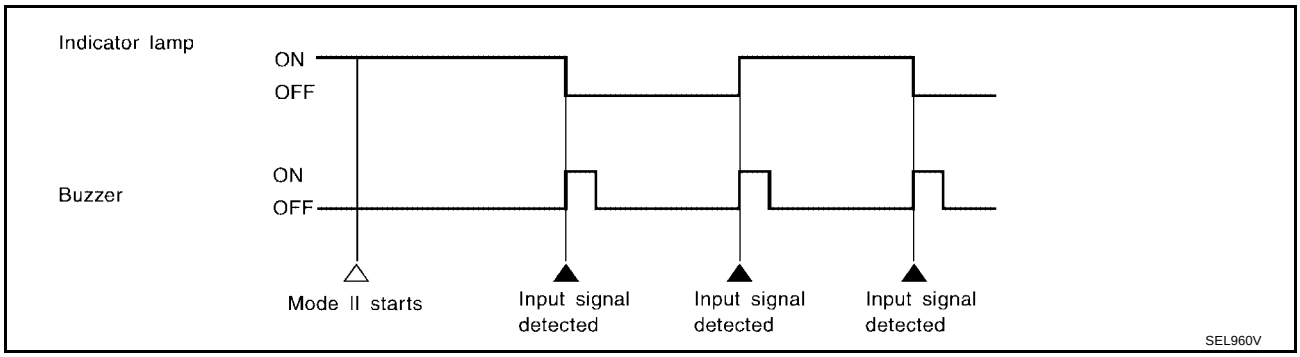
- Perform the diagnosis on the switch system to each control unit.

How To Perform Switch Monitor



DESCRIPTION

- In this mode, when BCM detects the input signal from a switch in IVMS as shown below, the detection is indicated by the front map lamp and front step lamps with buzzer.



SWITCH MONITOR ITEM

- The status of the switch (except the ignition switch, interior lamp switch, and map lamp switch) as input to each control unit can be monitored.

BCM	Front door switch (driver side)
	Front door switch (passenger side)
	Rear door switch LH
	Rear door switch RH

CANCEL OF SWITCH MONITOR

- Turn ignition switch OFF.
- Drive the vehicle at more than 7 km/h (4 MPH).

Trouble Diagnosis For Door Warning Lamp

EKS002HS

Symptom	Diagnostic procedure and repair order
Door warning lamp does not illuminate with any of doors open.	● Check combination meter circuit. Refer to DI-15, "Power Supply and Ground Circuit Check" . ● Check front door switch. Refer to DI-37, "SWITCH MONITOR" . ● Check rear door switch. Refer to DI-37, "SWITCH MONITOR" . If the above systems work properly, replace the BCM.
Door warning lamp illuminates constantly.	● Check combination meter circuit. Refer to DI-15, "Power Supply and Ground Circuit Check" . ● Check front door switch. Refer to DI-37, "SWITCH MONITOR" . ● Check rear door switch. Refer to DI-37, "SWITCH MONITOR" . If the above systems work properly, replace the BCM.

Oil Pressure Warning Lamp Stays Off (Ignition Switch ON)

EKS002HT

1. INSPECTION 1 BETWEEN IPDM E/R AND COMBINATION METER

1. Activate IPDM E/R auto active test. Refer to PG-19, "Auto Active Test" .

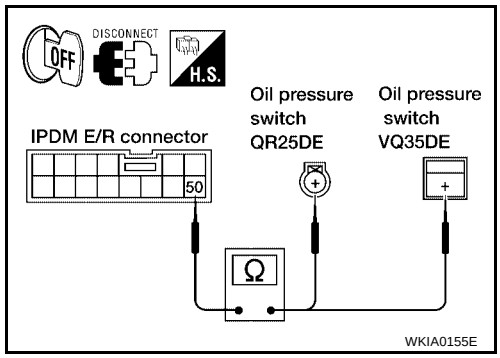
Does auto active test activate?

Yes >> Replace combination meter.
No >> GO TO 2.

2. CHECK OIL PRESSURE SWITCH CIRCUIT

1. Disconnect IPDM E/R connector and oil pressure switch connector.
2. Check continuity between IPDM E/R harness connector E121 terminal 50 (P/L) and oil pressure switch connector terminal + (P/L).

50 - + **Continuity should exist.**



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK OIL PRESSURE SWITCH

1. Check oil pressure switch. Refer to DI-40, "OIL PRESSURE SWITCH"

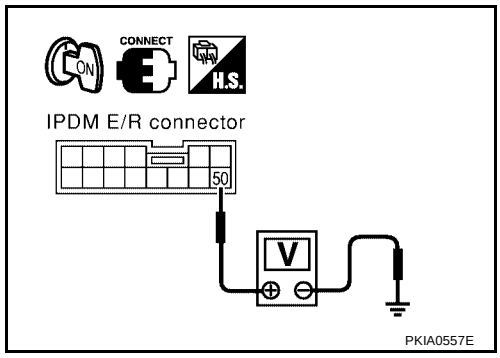
OK or NG

OK >> GO TO 4.
NG >> Replace the oil pressure switch.

4. IPDM E/R VOLTAGE INSPECTION

1. Connect IPDM E/R connector.
2. Turn the ignition switch ON.
3. Check voltage between IPDM E/R harness connector E121 terminal 50 (P/L) and body ground.

50 - Ground **Approx. 0V**



OK or NG

OK >> Perform BCM self-diagnosis.
NG >> Replace IPDM E/R.

Oil Pressure Warning Lamp Does Not Turn Off (Oil Pressure Is Normal)

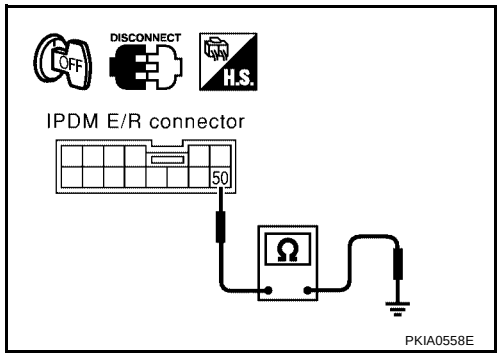
EKS002HU

NOTE:
For oil pressure inspection, refer to LU-6, "OIL PRESSURE CHECK" (QR25DE) or LU-17, "OIL PRESSURE CHECK" (VQ35DE).

1. HARNESS CONTINUITY INSPECTION

1. Disconnect IPDM E/R connector and oil pressure switch connector.
2. Check continuity between IPDM E/R harness connector E121 terminal 50 (P/L) and ground.

50 - Ground **Continuity should not exist.**



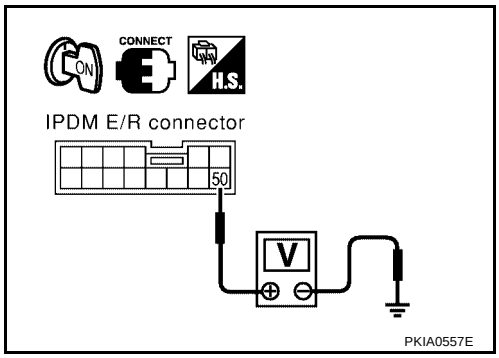
OK or NG

OK >> GO TO 2.
NG >> Repair harness or connector.

2. IPDM E/R VOLTAGE INSPECTION

1. Connect IPDM E/R connector.
2. Turn the ignition switch ON.
3. Check voltage between IPDM E/R harness connector E121 terminal 50 (P/L) and body ground.

50 - Ground **Approx. 12V**



OK or NG

OK >> Check oil pressure switch. Refer to DI-40, "OIL PRESSURE SWITCH" .

NG >> Replace IPDM E/R.

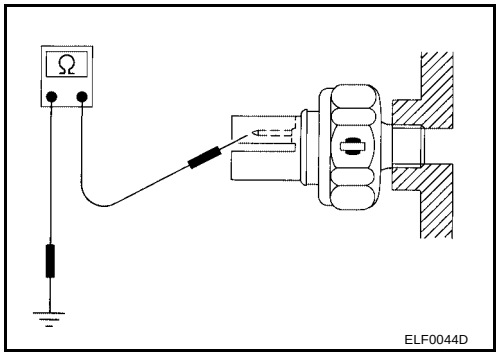
Component Inspection

EKS002HV

OIL PRESSURE SWITCH

Check continuity between the oil pressure switch and body ground.

	Oil pressure kPa (kg/cm^2)	Continuity
Engine stopped	Less than 0.029 (0.3)	Yes
Engine running	More than 0.029 (0.3)	No

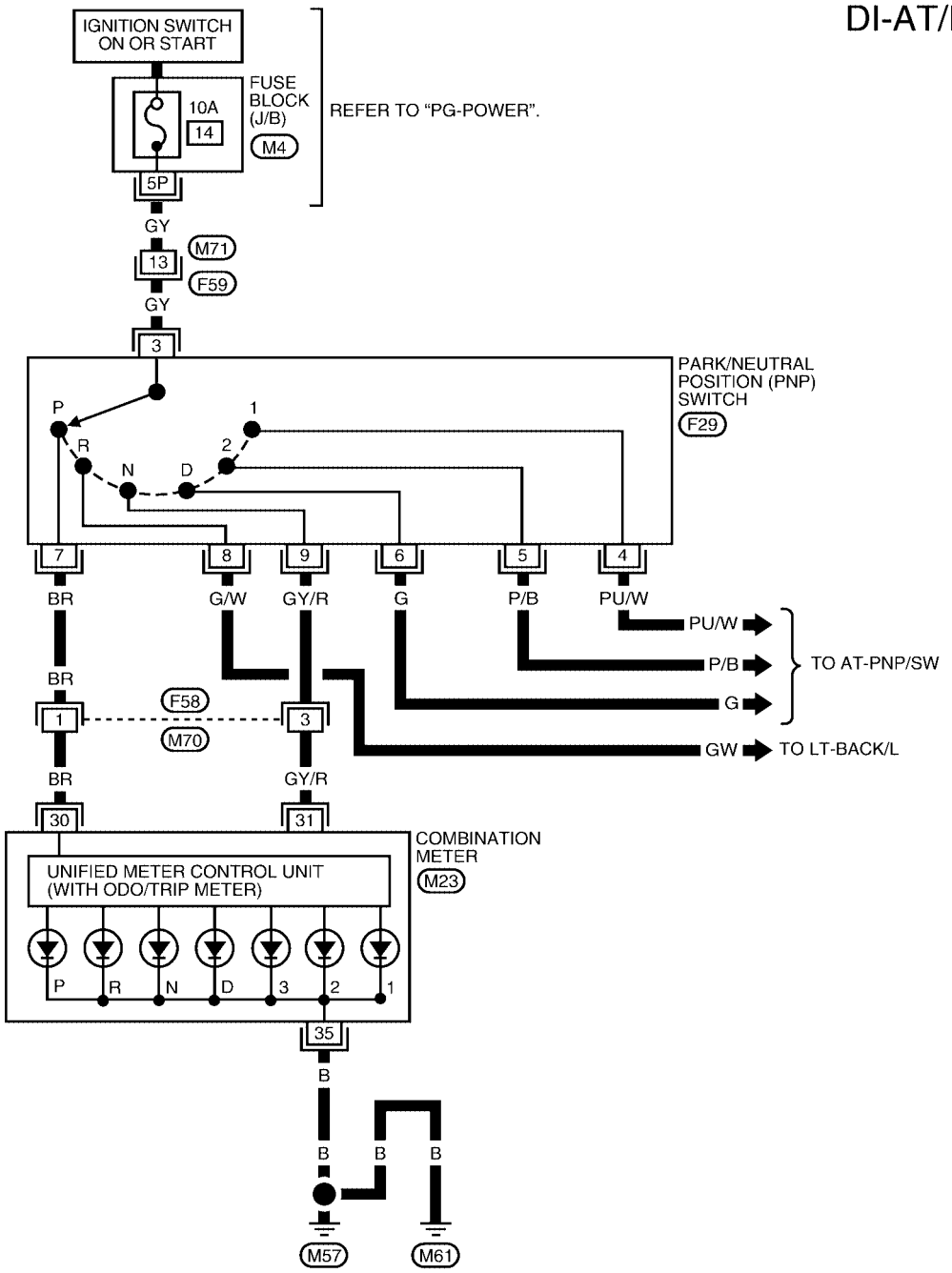


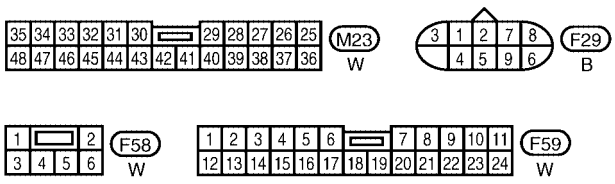
A/T INDICATOR

PFP:24814

Wiring Diagram — AT/IND —

EKS002HW





REFER TO THE FOLLOWING.
M4 - FUSE BLOCK (J/B)

LKWA0058E

Trouble Diagnosis

EKS002HX

SYMPTOM CHART

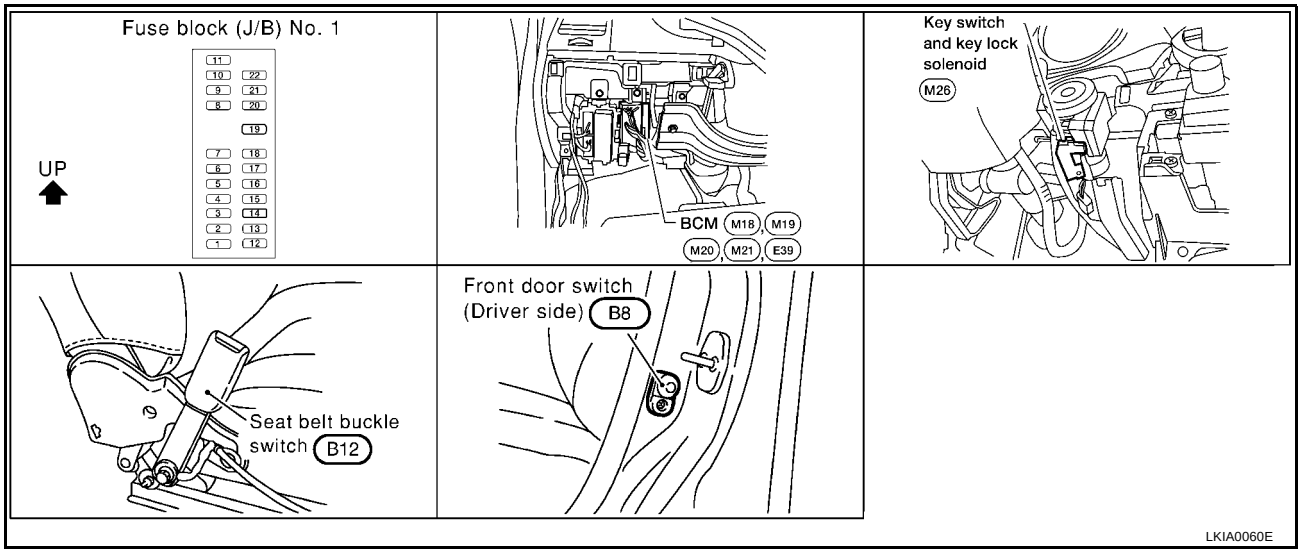
Symptom		Possible cause
A/T indicator lamp is abnormal.	All the lamps are inactive	A/T indicator does not illuminate. Refer to AT-212, "1. A/T Check (Position) Indicator Lamp Does Not Come On" .
	One lamp is inactive	● Check the combination meter connectors. If OK, replace combination meter.

WARNING CHIME

PFP:24814

Component Parts and Harness Connector Location

EKS002HZ



System Description

EKS002I0

FUNCTION

Item	Description
Ignition key warning chime	Sounds warning chime when driver's door is opened with key in ignition key cylinder and ignition switch "OFF" or "ACC" position.
Light warning chime	Sounds warning chime when driver's door is opened with lighting switch in the 1st or 2nd position and ignition switch "OFF" or "ACC" position.
Seat belt warning chime	Sounds warning chime for about 6 seconds if ignition switch is turned "ON" when driver's seat belt is unfastened.

Power is supplied at all times

- through 50A fuse (letter f, located in the fuse and fusible link box)
- to BCM terminal 7,
- through 10A fuse [No. 19, located in the fuse block (J/B)]
- to key switch and key lock solenoid terminal 3.

Ground is supplied

- to BCM terminal 8
- through body grounds E15 and E24 and
- to combination meter terminals 6 and 39
- through body grounds M57 and M61.

When a signal, or combination of signals, is received by the combination meter, the warning chime will sound.

IGNITION KEY WARNING CHIME

With the key inserted into the ignition switch, and the driver's door open, the warning chime will sound. Power is supplied

- through key switch and key lock solenoid terminal 4
- to BCM terminal 62, and

Ground is supplied

- to BCM terminal 14
- through front door switch LH terminal 2.

Front door switch LH is case grounded.

LIGHT WARNING CHIME

With the key removed from the ignition switch, the driver's door open, and the lighting switch in 1ST or 2ND position, the warning chime will sound. [Except when headlamp battery saver control operates (for 5 minutes after ignition switch is turned to OFF or ACC position) and headlamps do not illuminate.]
Signal is supplied

- from combination switch (lighting switch) terminals 40, 41, 42, 43, 47, 48, 49, 50, 51 and 52
- to BCM terminals 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10.

Ground is supplied

- from door switch LH terminal 2
- to BCM terminal 14.

Front door switch LH is case grounded.

SEAT BELT WARNING CHIME

With ignition switch turned ON and seat belt unfastened (seat belt switch ON), warning chime will sound for approximately 6 seconds.
Ground is supplied

- from seat belt buckle switch terminal 1
- to BCM terminal 28.

Seat belt terminal 2 is grounded through body grounds B7 and B19.

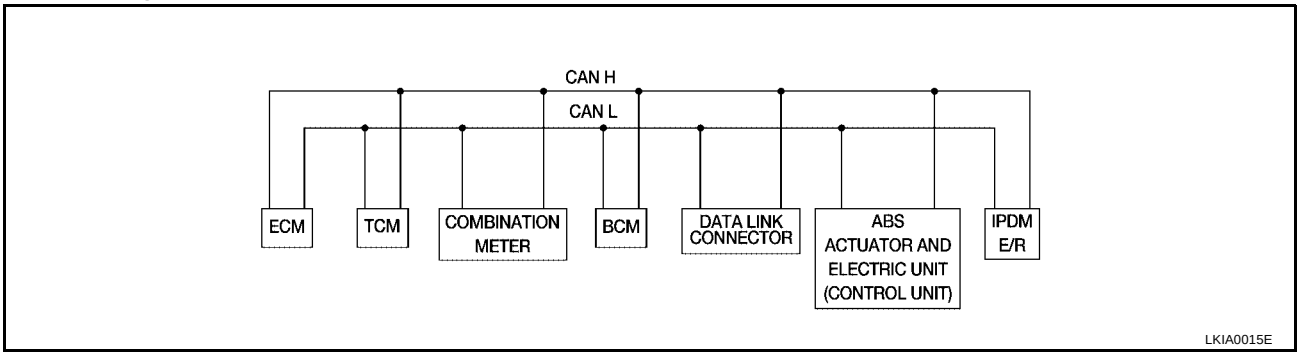
CAN Communication System Description

EKS002I1

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

FOR TCS MODELS

System Diagram



Input/Output Signal Chart

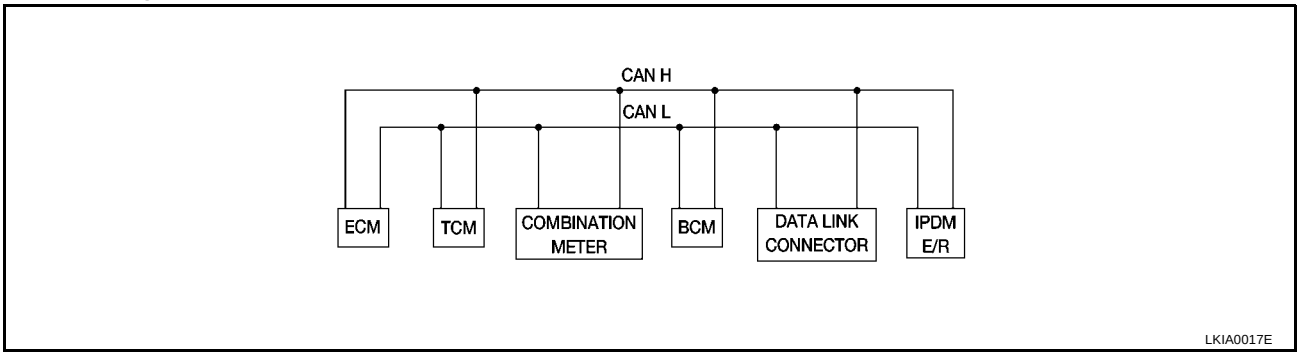
T: Transmit R: Receive

Signals	ECM	TCM	COMBINATION METER	BCM	ABS/TCS control unit	IPDM E/R
Engine speed signal	T		R		R	
Engine coolant temperature signal	T		R			
Accelerator pedal position signal	T					
Fuel consumption monitor signal	T		R			
A/T warning lamp signal		T	R			
A/T position indicator signal	R	T	R	R(R range only)	R	
ABS operation signal	R				T	
TCS operation signal	R	R			T	

Signals	ECM	TCM	COMBINATION METER	BCM	ABS/TCS control unit	IPDM E/R
Air conditioner switch signal	R			T		
Air conditioner compressor signal	R					T
A/C compressor request signal	T					R
Cooling fan motor operation signal	R					T
Cooling fan speed request signal	T					R
Position lights request			R	T		R
Position lights status				R		T
Low beam request				T		R
Low beam status	R			R		T
High beam request			R	T		R
High beam status	R			R		T
Front fog lights request				T		R
Front fog light status				R		T
OD cancel switch signal		R	T			R
Brake switch signal		R	T			
Vehicle speed signal	R		T			
	R		T	R		
Oil pressure switch			R			T
Sleep request1			R	T		
Sleep request2				T		R
N range switch signal		R	T			
P range switch signal		R	T			
Seat belt buckle switch signal			T	R		
Door switch signal			R	T		R
Tail lamp request			R	T		R
Turn indicator signal			R	T		
Buzzer output signal			R	T		
Trunk switch signal			R	T		
ASCD main switch signal	T		R			
ASCD cruise signal	T		R			
Wiper operation				R		T
Wiper stop position signal				R		T
Rear window defogger switch signal				T		R
Rear window defogger control signal	R			R		T

FOR A/T MODELS

System Diagram



Input/Output Signal Chart

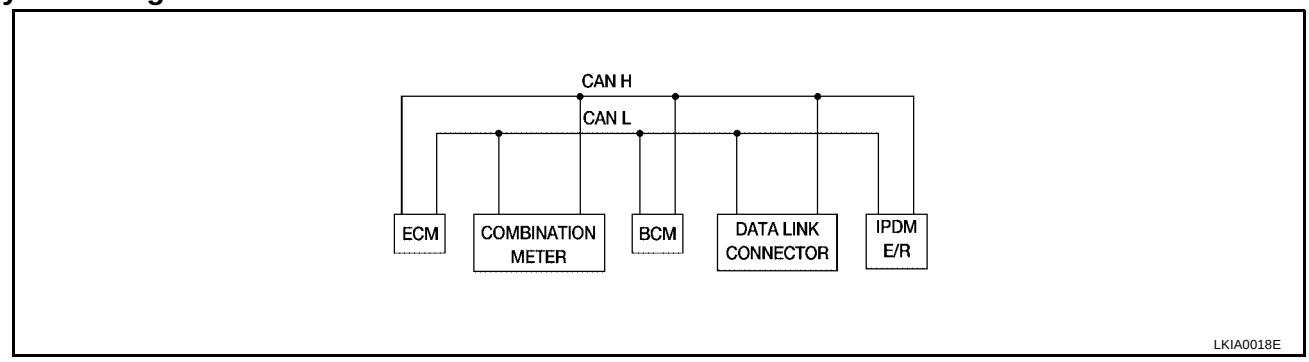
T: Transmit R: Receive

Signals	ECM	TCM	COMBINATION METER	BCM	IPDM E/R
Engine speed signal	T		R		
Engine coolant temperature signal	T		R		
Accelerator pedal position signal	T				R
Fuel consumption monitor signal	T		R		
A/T warning lamp signal		T	R		
A/T position indicator signal	R	T	R	R(R range only)	
Air conditioner switch signal	R			T	
Air conditioner compressor signal	R				T
A/C compressor request signal	T				R
Blower fan switch signal	R(QR25DE)			T	
Cooling fan motor operation signal	R			T	
Cooling fan speed request signal	T				R
Position lights request			R	T	R
Position lights status				R	T
Low beam request				T	R
Low beam status	R			R	T
High beam request			R	T	R
High beam status	R			R	T
Front fog lights request				T	R
Front fog light status				R	T
OD cancel switch signal		R	T		R
Brake switch signal		R	T		
Vehicle speed signal	R		T		
	R		T	R	
Oil pressure switch			R		T
Sleep request1			R	T	
Sleep request2				T	R
N range switch signal		R	T		
P range switch signal		R	T		
Seat belt buckle switch signal			T	R	
Door switch signal			R	T	R

Signals	ECM	TCM	COMBINATION METER	BCM	IPDM E/R
Tail lamp request			R	T	R
Turn indicator signal			R	T	
Buzzer output signal			R	T	
Trunk switch signal			R	T	
ASCD main switch signal	T		R		
ASCD cruise signal	T		R		
Wiper operation				R	T
Wiper stop position signal				R	T
Rear window defogger switch signal				T	R
Rear window defogger control signal	R			R	T

FOR M/T MODELS

System Diagram



Input/Output Signal Chart

T: Transmit R: Receive

Signals	ECM	COMBINATION METER	BCM	IPDM E/R
Engine speed signal	T			
Engine coolant temperature signal	T			
Fuel consumption monitor signal	T			
Air conditioner switch signal	R		T	
Air conditioner compressor signal	R			T
A/C compressor request signal	T			R
Blower fan switch signal	R(QR25DE)		T	
Cooling fan motor operation signal	R			T
Cooling fan speed request signal	T			R
Position lights request		R	T	R
Position lights status			R	T
Low beam request			T	R
Low beam status	R		R	T
High beam request		R	T	R
High beam status	R		R	T
Front fog lights request			T	R
Front fog light status			R	T
Vehicle speed signal	R	T		
Oil pressure switch		R		T

Signals	ECM	COMBINATION METER	BCM	IPDM E/R
Sleep request1		R	T	
Sleep request2			T	R
Seat belt buckle switch signal		T	R	
Door switch signal		R	T	R
Tail lamp request		R	T	R
Turn indicator signal		R	T	
Buzzer output signal		R	T	
Trunk switch signal		R	T	
ASCD main switch signal	T	R		
ASCD cruise signal	T	R		
Wiper operation			R	T
Wiper stop position signal			R	T
Rear window defogger switch signal			T	R
Rear window defogger control signal	R		R	T

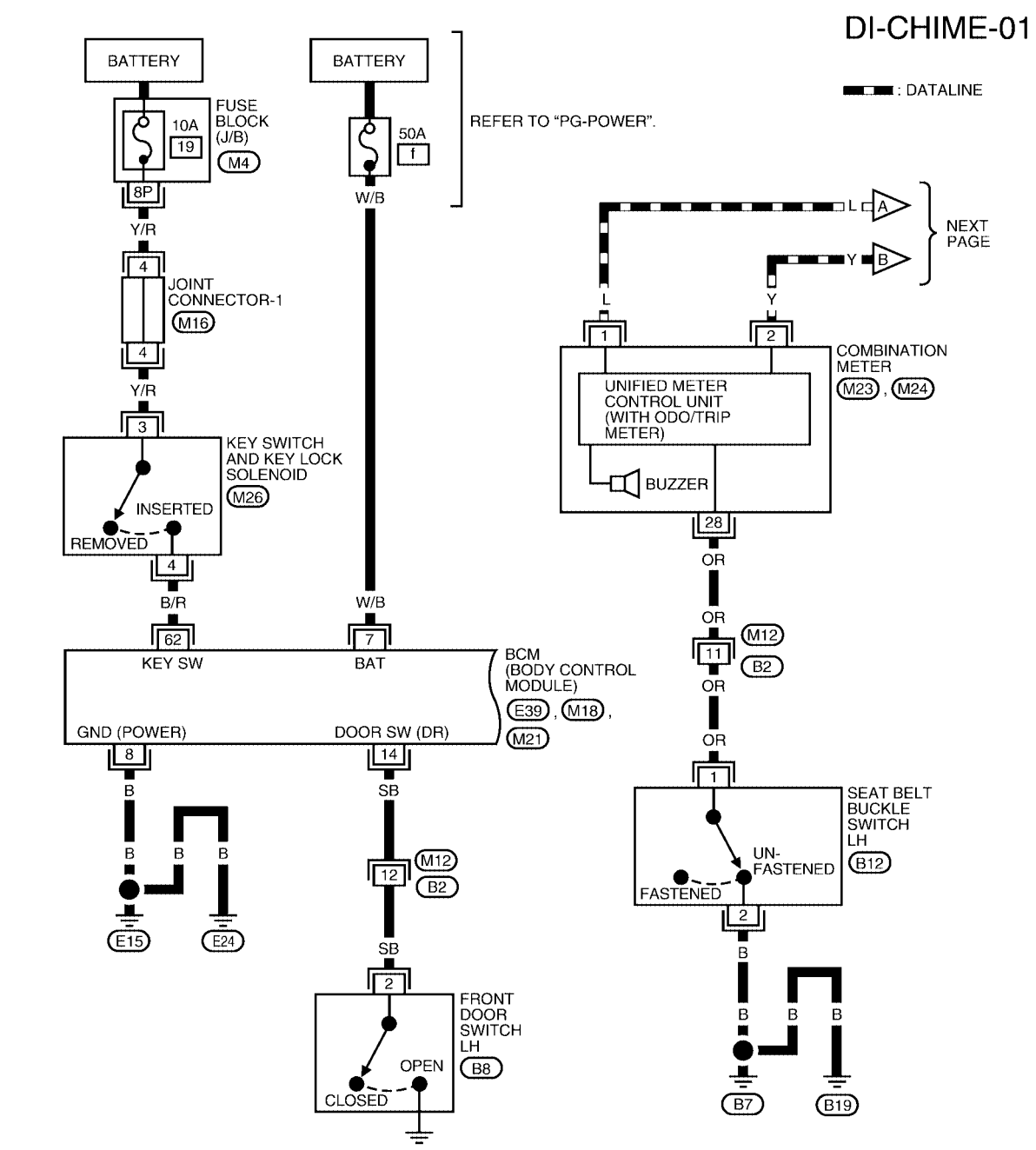
Major Component Parts and Function

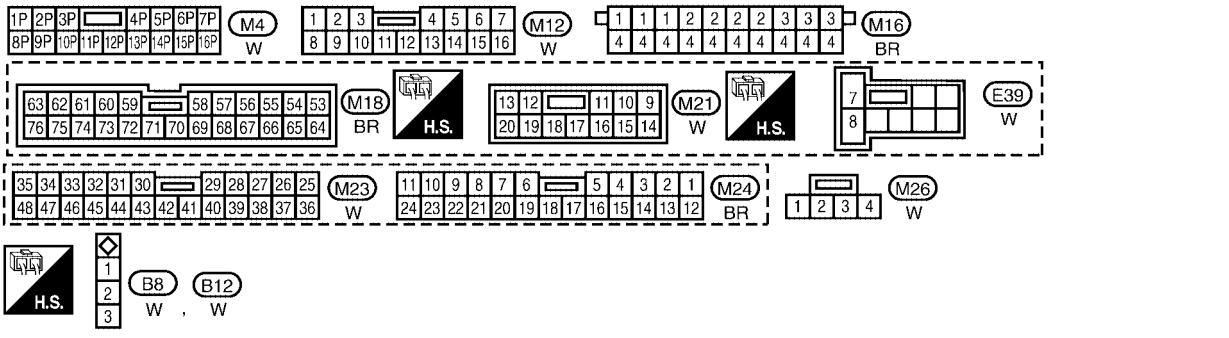
EKS002I2

Components	Functions
BCM	It operates the warning chime intermittently by signals from the ignition switch, key detection switch, lighting switch, or front door switch (driver side) or seat belt buckle switch (driver side).
Warning chime	It generates intermittent sounds by signals from the BCM.

Wiring Diagram — CHIME —

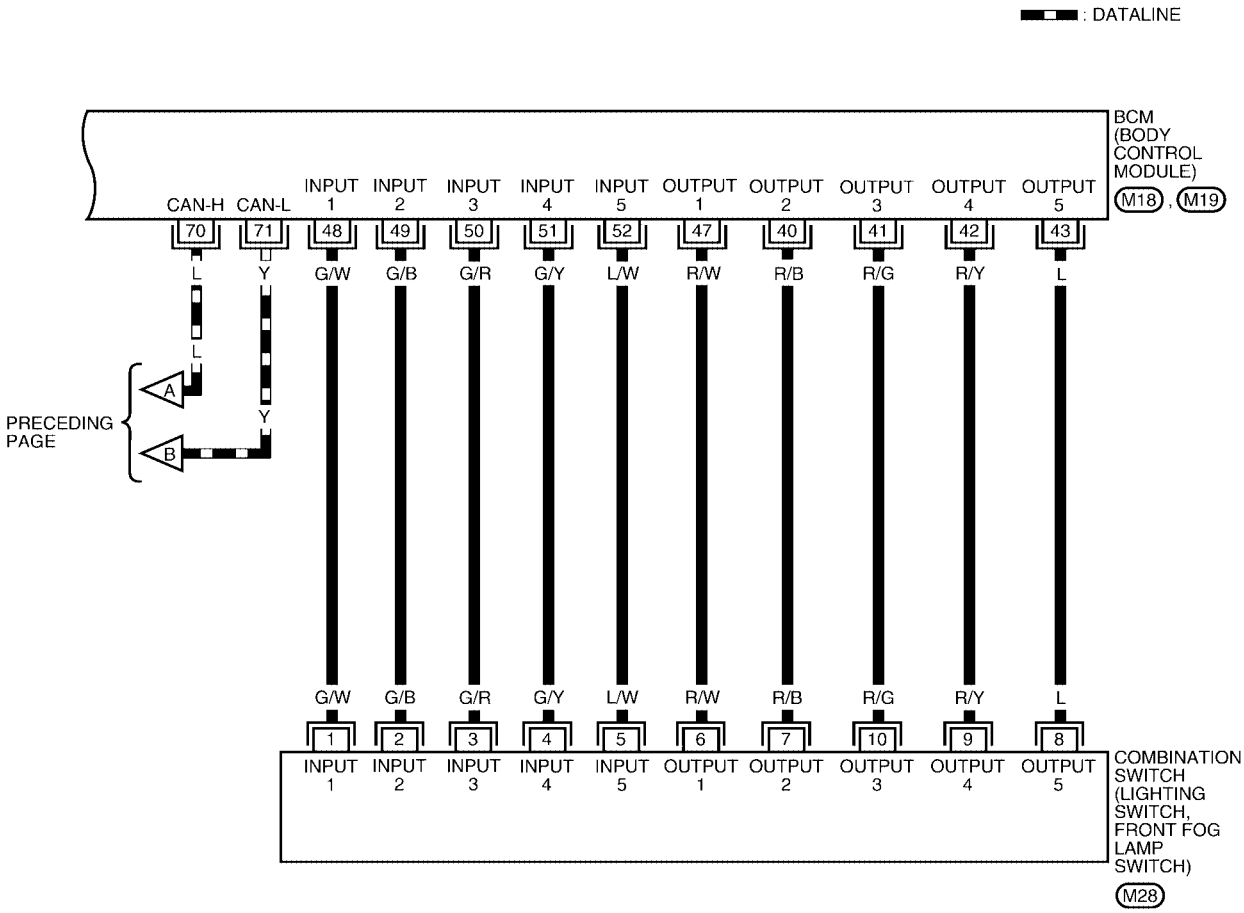
EKS002I3

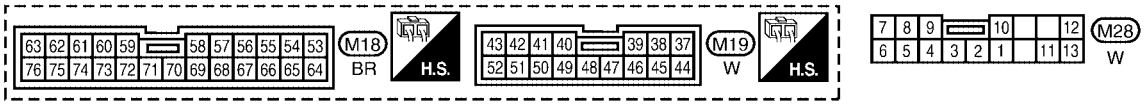




LKWA0059E

DI-CHIME-02

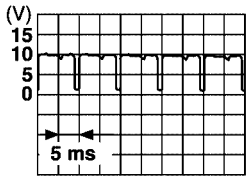
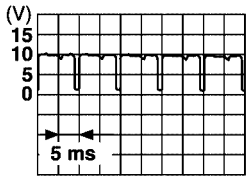




LKWA0060E

Terminals and Reference Value for BCM

EKS002I4

Terminal No.	Wire color	Item	Condition		Voltage (V) (Approx.)
			Ignition switch	Measurement method	
7	W/B	Battery power supply	OFF	—	12V
8	B	Ground	ON	—	0
51	G/Y	Combination switch input 4	ON	Lighting switch and wiper switch are OFF.	5 or more
52	L/W	Combination switch input 5	ON	Lighting switch and wiper switch are OFF.	5 or more
14	SB	Front door switch signal	OFF	Driver door: ON (open)	0
				Driver door: OFF (closed)	5
42	R/Y	COMB SW OUTPUT 4	ON	—	 SKIA1119J
43	L	COMB SW OUTPUT 5	ON	—	 SKIA1119J
62	B/R	Key switch signal	OFF	Key is removed.	0
				Key is inserted.	12V
70	L	CAN H	OFF	—	—
71	Y	CAN L	OFF	—	—

How to Proceed With Trouble Diagnosis

EKS002I5

1. Confirm the trouble symptom or customer complaint.
2. Understand operation description and function description. Refer to DI-43, "System Description" .
3. Carry out the Preliminary Check. Refer to DI-51, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does the warning chime operate normally? Yes: Go to 6. No: Go to 4.
6. INSPECTION END.

Preliminary Check

EKS002I6

INSPECTION FOR POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

- Check for blown BCM fuses.

UNIT	POWER SOURCE	FUSE No.
BCM	Battery	f

Refer to DI-49, "Wiring Diagram — CHIME —" .

OK or NG

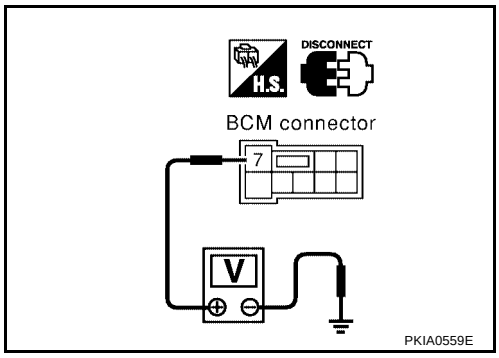
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of problem before installing new fuse. Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .

2. POWER SUPPLY CIRCUIT CHECK

1. Disconnect BCM connector.
2. Check voltage between BCM connector E39 terminal 7 (W/B) and ground.

Terminals			Ignition switch position
(+)		(-)	OFF
Connector	Terminal (Wire color)		
E39	7 (W/B)	Ground	Battery voltage



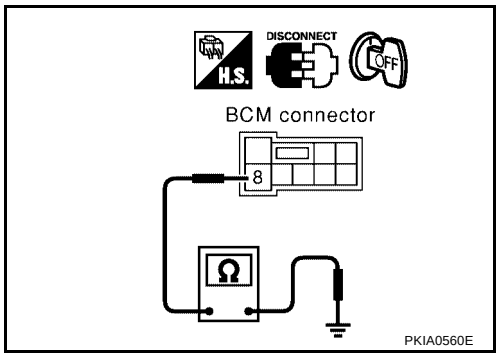
OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3. GROUND CIRCUIT CHECK

Check continuity between BCM harness connector E39 terminal 8 and body ground.

Terminals			Continuity
(+)		(–)	
Connector	Terminal		
E39	8	Ground	Yes



OK or NG

OK >> INSPECTION END.
NG >> Check harness ground circuit.

CONSULT–II Function

EKS002I7

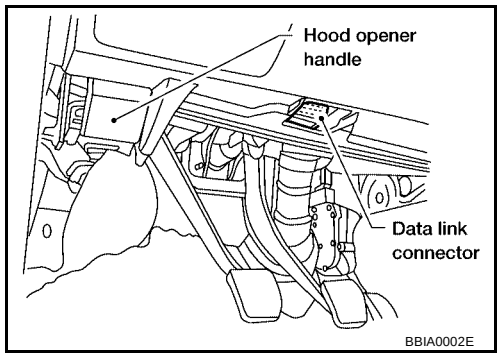
- CONSULT-II executes the following functions by combining data reception and command transmission via the communication line from BCM. IVMS communication inspection, work support, self-diagnosis, data monitor, and active test display.

DIAGNOSTIC ITEMS DESCRIPTION

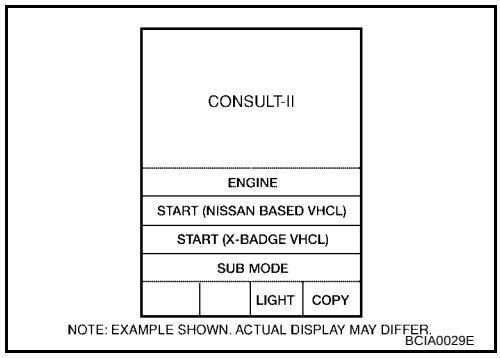
BCM diagnosis position	Diagnosis mode	Description
KEY WARN ALM	Data monitor	The input data to the BCM control unit is displayed in real time.
	Active test	Operation of electrical loads can be checked by sending driving signal to them.
LIGHT WARN ALM	Data monitor	The input data to the BCM control unit is displayed in real time.
	Active test	Operation of electrical loads can be checked by sending driving signal to them.
SEAT BELT ALM	Data monitor	The input data to the BCM control unit is displayed in real time.
	Active test	Operation of electrical loads can be checked by sending driving signal to them.
BCM	Self-diagnostic	BCM performs self-diagnosis of CAN communication and combination switch.

CONSULT-II BASIC OPERATION PROCEDURE

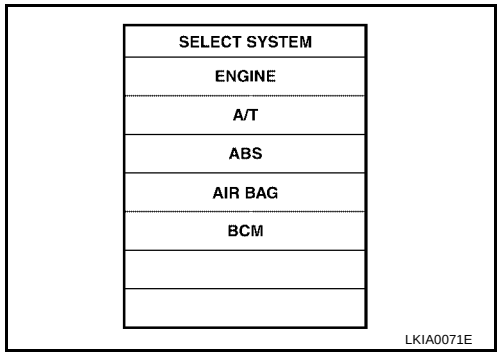
1. With the ignition switch OFF, connect CONSULT-II to the data link connector, and turn the ignition switch ON.



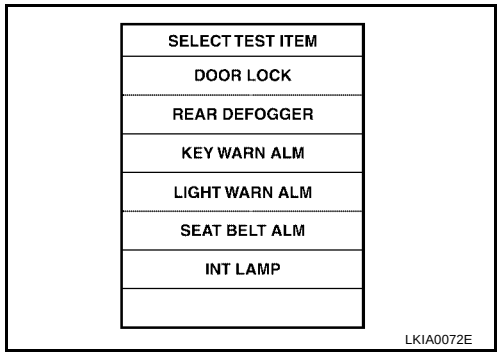
2. Touch “START”.



3. Touch “BCM”.



4. Touch “KEY WARN ALM”, “LIGHT WARN ALM”, “SEAT BELT ALM” or “BCM C/U”.
5. Select “DATA MONITOR” “ACTIVE TEST” or “SELF-DIAG RESULTS”.



DATA MONITOR

Operation procedure

1. Touch “IGN WARN ALM”, “LIGHT WARN ALM” or “SEAT BELT ALM” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch “ALL SIGNALS” or “SELECTION FROM MENU” on “DATA MONITOR" screen.

ALL SIGNALS	Monitors the main items.
SELECTION FROM MENU	Selects and monitors the items.

4. Touch “START”.

5. If “SELECTION FROM MENU” is selected, touch the desired monitor item. If “ALL SIGNALS” is selected, all items required to control are monitored.
6. During monitoring, touching “RECORD” can start recording the monitored item status.

Data monitor item (Key warning chime)

Monitored item	Description
IGN ON SW	Indicates [ON/OFF] condition of electronic key switch.
KEY ON SW	Indicates [ON/OFF] condition of ignition switch.
DOOR SW-DR	Indicates [ON/OFF] condition of front door switch LH.

Data monitor item (Light warning chime)

Monitored item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch.
DOOR SW-DR	Indicates [ON/OFF] condition of front door switch LH.
TAIL LAMP SW	Indicates [ON/OFF] condition of lighting switch.
FR FOG SW	Indicates [ON/OFF] condition of front fog lamp switch.

Data monitor item (Seat belt warning chime)

Monitored item	Description
IGN ON SW	Indicates [ON/OFF] condition of ignition switch.
SEAT BELT SW	Indicates [ON/OFF] condition of seat belt buckle switch.

ACTIVE TEST

Operation procedure

1. Touch “IGN WARN ALM”, “LIGHT WARN ALM” or “SEAT BELT ALM” on “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
3. Touch the item to be tested, and check the operation.
4. During the operation check, touching “OFF” deactivates the operation.

Active test item (Key warning chime)

Test item	Malfunction detecting condition
CHIME	This test is able to check key warning chime operation. Key warning chime sounds for 2 seconds after touching “ON” on CONSULT-II screen.

Active test item (Light warning chime)

Test item	Malfunction detecting condition
CHIME	This test is able to check light warning chime operation. Light warning chime sounds for 2 seconds after touching “ON” on CONSULT-II screen.

Active test item (Seat belt warning chime)

Test item	Malfunction detecting condition
CHIME	This test is able to check seat belt warning chime operation. Seat belt warning chime sounds for 2 seconds after touching “ON” on CONSULT-II screen.

SELF-DIAGNOSTIC RESULTS

Operation Procedure

1. Touch “BCM C/U” on “DIAGNOSIS ITEM SELECTION” screen.
2. Touch “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.
3. Self-diagnostic results are displayed.

Display Item List

Items to be displayed	CONSULT-II display	Description
CAN communication	CAN communication [U1000]	Malfunction is detected in CAN communication.
Combination switch	Diagnosis 1 - 5 systems open circuit	Malfunction is detected in combination switch system.

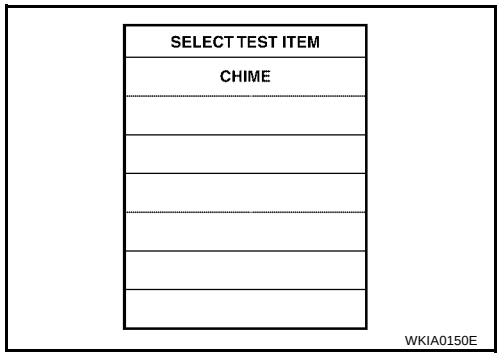
NOTE:
If "CAN communication [U1000]" is indicted, after printing the monitor item, go to "CAN system". Refer to LAN-7, "CAN SYSTEM (FOR TCS MODELS)" , LAN-28, "CAN SYSTEM (FOR A/T MODELS)" or LAN-45, "CAN SYSTEM (FOR M/T MODELS)" .

All Warnings Are Not Operated

EKS002I8

1. CHIME OPERATION INSPECTION

Select “KEY WARN ALM”, “LIGHT WARN ALM” or “SEAT BELT ALM” on CONSULT-II, and perform “CHIME” active test.



Does chime sound?

OK >> GO TO 4.
NG >> GO TO 2.

2. BCM SELF-DIAGNOSIS

Select BCM on CONSULT-II, and perform “BCM C/U” self-diagnosis.

Self-diagnostic results content

No malfunction detected>> GO TO 3.
CAN communication [U1000]>> After printing the monitor item, go to "CAN system" Refer to LAN-7, "CAN SYSTEM (FOR TCS MODELS)" , LAN-28, "CAN SYSTEM (FOR A/T MODELS)" , LAN-45, "CAN SYSTEM (FOR M/T MODELS)" .
Diagnosis 1 - 5 systems open circuit>> Malfunction in combination switch system. Go to BCS-16, "Combination Switch Inspection According to Self-Diagnostic Results" according to self-diagnostic results.

3. DATA MONITOR INSPECTION

Select BCM on CONSULT-II. Operate each switch with data monitor of “KEY WARN ALM”, “LIGHT WARN ALM” or “SEAT BELT ALM” and check operation status of applicable switches.

Switch operation	CONSULT-II display	Operation status
Ignition switch (ON)	IGN ON SW	ON
Ignition switch (OFF)		OFF
Ignition switch (key in switch)	KEY ON SW	ON
Ignition switch (key out of switch)		OFF
Driver door (open)	DOOR SW-DR	ON
Driver door (closed)		OFF
Headlamp switch (1st position)	TAIL LAMP SW	ON
Headlamp switch (OFF)		OFF
Fog lamp switch (ON)	FR FOG SW	ON
Fog lamp switch (OFF)		OFF
Seat belt switch (closed)	SEAT BELT SW	ON
Seat belt switch (open)		OFF

OK or NG

OK >> Replace combination meter.
NG >> GO TO 4.

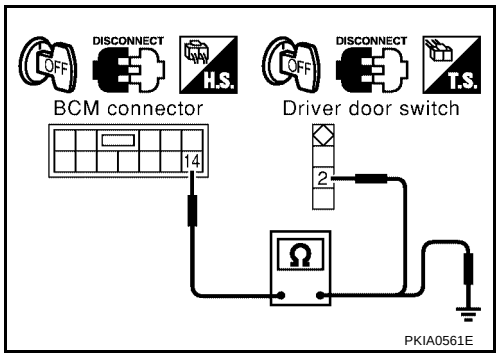
4. CONTINUITY INSPECTION OF DOOR SWITCH CIRCUIT

1. Disconnect BCM connector and driver door switch connector.
2. Check harness continuity (open circuit) between BCM harness connector M21 terminal 14 (SB) and driver door switch harness connector B8 terminal 2 (SB).

14 - 2 : Continuity should exist.

3. Check continuity (short circuit) between BCM harness connector M21 terminal 14 (SB) and ground.

14 - Ground : Continuity should not exist.



OK or NG

OK >> Replace driver door switch.
NG >> Repair harness or connector.

Key Warning Chime Does Not Operate

EKS002I9

1. CHECK FUSE

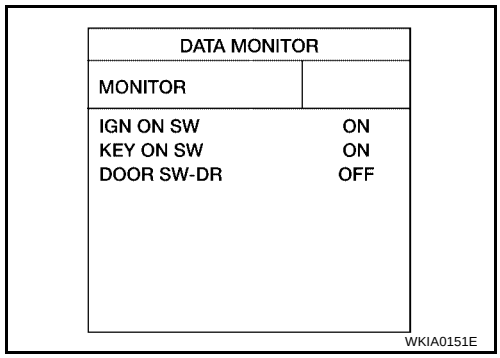
Check if the key detection switch fuse is blown. Refer to DI-49, "Wiring Diagram — CHIME —" .

Is the fuse blown?

OK >> Replace fuse. Be sure to repair the cause of the problem before installing new fuse.
NG >> GO TO 2.

2. KEY SWITCH INSPECTION

With “KEY WARN ALM” on the data monitor, insert the key into the ignition cylinder to check ON/OFF operation.



Switch operation	CONSULT-II display	Operation status
Ignition switch (ON)	IGN ON SW	ON
Ignition switch (OFF)		OFF
Ignition switch (key in switch)	KEY ON SW	ON
Ignition switch (key out of switch)		OFF
Driver door (open)	DOOR SW-DR	ON
Driver door (closed)		OFF

OK or NG

OK >> Replace BCM.
NG >> GO TO 3.

3. IGNITION SWITCH VOLTAGE INSPECTION

1. Remove key from ignition cylinder.
2. Disconnect key switch.
3. Check voltage between key switch harness connector M26 terminal 3 (Y/R) and ground.

3 - Ground : Approx. 12V

OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

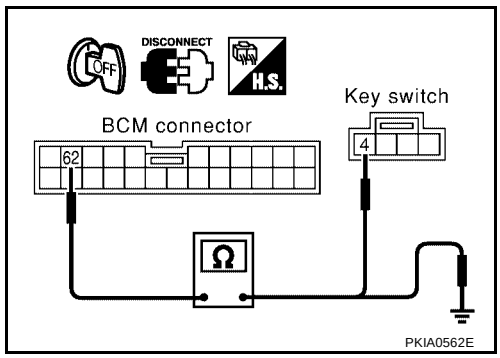
4. HARNESS CONTINUITY INSPECTION

1. Disconnect BCM connector.
2. Check harness continuity (open circuit) between BCM harness connector M18 terminal 62 (B/R) and key switch harness connector M26 terminal 4 (B/R).

62 - 4 : Continuity should exist.

3. Check harness continuity (short circuit) between BCM harness connector M18 terminal 62 (B/R) and ground.

62 - Ground : Continuity should not exist.



OK or NG

OK >> Replace key switch.
NG >> Repair harness or connector.

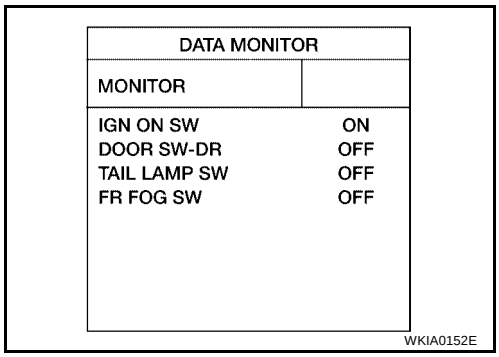
Light Warning Chime Does Not Operate

EKS002IA

1. DATA MONITOR INSPECTION

With "LIGHT WARN ALM" on the data monitor, confirm “TAIL LAMP SW” and “FR FOG SW” turn ON/OFF when lighting switch and front fog switch are operated.

Switch operation	CONSULT-II display	Operation status
Headlamp switch (1st position)	TAIL LAMP SW	ON
Headlamp switch (OFF)		OFF
Fog lamp switch (ON)	FR FOG SW	ON
Fog lamp switch (OFF)		OFF



OK or NG

OK >> GO TO 2.
NG >> Replace lighting switch.

2. INSPECTION BETWEEN COMBINATION SWITCH AND BCM

Select BCM on CONSULT-II, and perform “BCM C/U” self-diagnosis.

Self-diagnostic results content

No malfunction detected>> Replace BCM.
CAN communication or CAN communication system>> Check BCM CAN communication system. Go to LAN-3, "CAN COMMUNICATION" .
Diagnosis 1 - 5 systems open circuit>> Malfunction in combination switch system. Go to BCS-16, "Combination Switch Inspection According to Self-Diagnostic Results" according to self-diagnostic results.

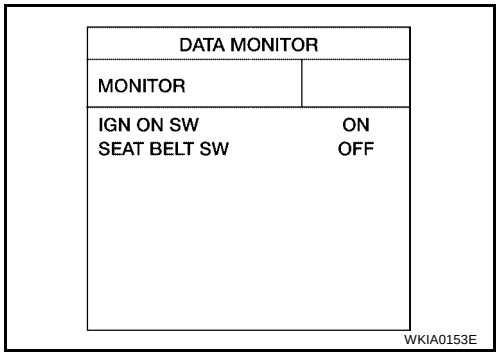
Seat Warning Chime Does Not Operate

EKS002IB

1. DATA MONITOR INSPECTION

With "SEAT BELT ALM" on the data monitor, confirm “SEAT BELT SW” when the seat belt buckle switch is operated.

Switch operation	CONSULT-II display	Operation status
Seat belt switch (closed)	SEAT BELT SW	ON
Seat belt switch (open)		OFF



OK or NG

OK >> GO TO 2.
NG >> Replace seat belt buckle switch.

2. INSPECTION BETWEEN COMBINATION SWITCH AND BCM

Select BCM on CONSULT-II, and perform “BCM C/U” self-diagnosis.

Self-diagnostic results content

No malfunction detected>> Replace BCM.
CAN communication or CAN communication system>> Check BCM CAN communication system. Go to LAN-3, "CAN COMMUNICATION" .
Diagnosis 1 - 5 systems open circuit>> Malfunction in combination switch system. Go to BCS-16, "Combination Switch Inspection According to Self-Diagnostic Results" according to self-diagnostic results.

BOARD COMPUTER

PFP:24810

System Description

EKS002IC

FUNCTION

The board computer can indicate the following items.

- Outside air temperature
- DTE (distance to empty)
- Trip distance
- Trip time
- Average fuel consumption
- Average vehicle speed

OUTSIDE AIR TEMPERATURE INDICATION

The outside air temperature indication is displayed while the ignition switch is in the ON position.
Signal is supplied

- through ambient sensor terminal 1
- to combination meter (board computer) terminal 13.

Indication range is between -30 and 55°C (-22 and 131°F). When outside temperature is less than -30°C (-22°F), display shows ICY. When outside temperature is more than 55°C (131°F), indication will be blank. When outside temperature is less than 3°C (37°F) continuously, display will blink as a warning. In this case, the display will change to the outside air temperature mode even though the display is showing a different mode. The indicated temperature is not affected by engine heat. It changes only when one of the following conditions exists.

- When vehicle speed is more than 20 km/h (12 MPH).
- The ignition switch has been turned OFF for more than 3.5 hours.
- When outside air temperature is less than the indicated temperature.

DTE (DISTANCE TO EMPTY) INDICATION

The range indication provides the driver with an estimation of the distance that can be driven before refueling. The range is calculated by signals from the fuel level sensor unit (fuel remaining), ECM (fuel consumption) and vehicle speed sensor. The indication will be refreshed every 30 seconds. When fuel remaining is less than approximately 10 ℓ (10 5/8 US quarts, 8 3/4 Imp quarts), the indication will blink as a warning. If the fuel remaining is less than approximately 8 ℓ (8 1/2 US quarts, 7 Imp quarts), the indication will show "---". In this case, the display will change to the DTE mode even though the display is showing a different mode. When the battery is disconnected and reconnected, DTE mode will display "---" until the vehicle is driven 500 miles (804.5 km).

TRIP DISTANCE

Trip distance is calculated by signal from the vehicle speed sensor. If trip distance is reset, trip time will be reset at the same time.

TRIP TIME

Trip time displays accumulate ignition switch ON time. If trip time is reset, trip distance will be reset at the same time.

AVERAGE FUEL CONSUMPTION

Average fuel consumption indication is calculated by signals from the vehicle speed sensor and the ECM (fuel consumption). The indication will be refreshed every 30 seconds.

AVERAGE VEHICLE SPEED

Average vehicle speed indication is calculated by running distance and running time. The indication will be refreshed every 30 seconds. If average vehicle speed is reset, average fuel consumption will be reset at the same time. After resetting, the display will show "---" for 30 seconds.

HOW TO CHANGE/RESET INDICATION

Indication can be changed in the following order by momentarily depressing the board computer switch or the board computer steering switch.
Outside air temperature → DTE → Trip distance → Trip time → Average fuel consumption → Average vehicle speed.

Holding the switch for more than 0.8 second will reset the indication of the currently displayed mode (trip distance, trip time, average vehicle speed or average fuel consumption).

NOTE:
After the display changes automatically, the indication can be changed to the last mode by pushing the board computer switch or the board computer steering switch.

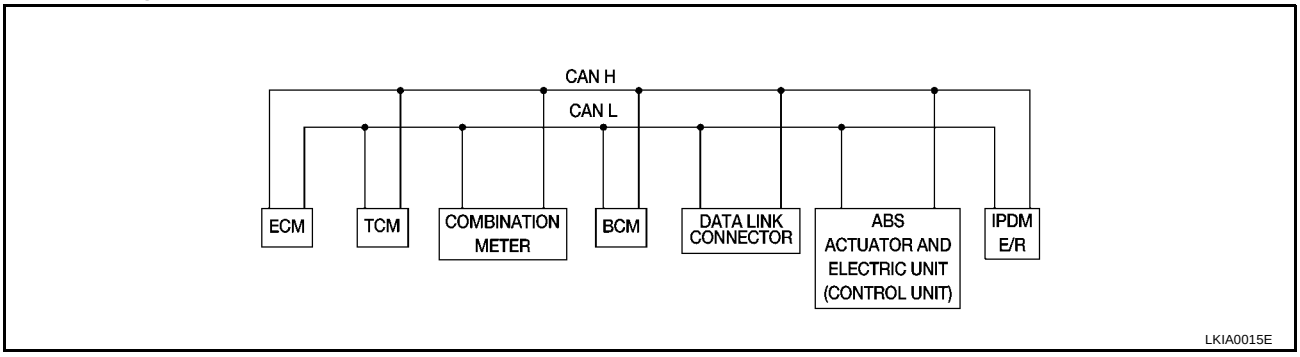
CAN Communication System Description

EKS002ID

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

FOR TCS MODELS

System Diagram



Input/Output Signal Chart

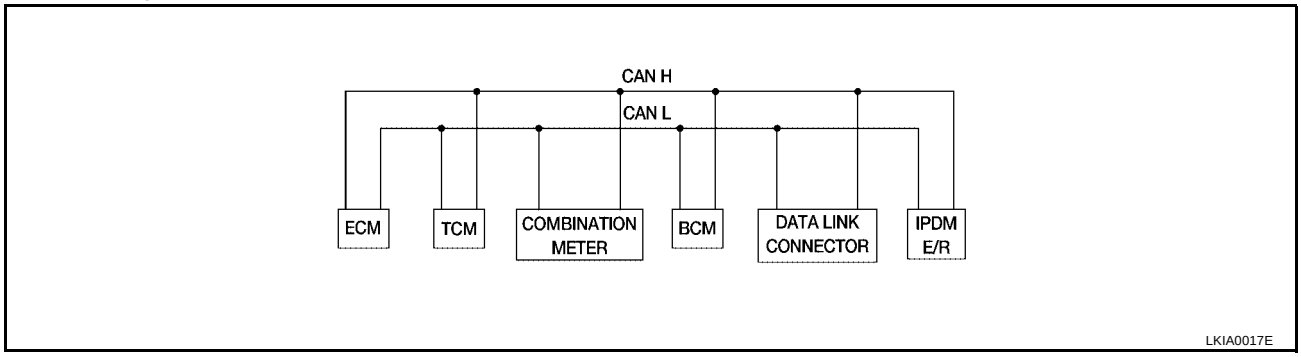
T: Transmit R: Receive

Signals	ECM	TCM	COMBINATION METER	BCM	ABS/TCS control unit	IPDM E/R
Engine speed signal	T		R		R	
Engine coolant temperature signal	T		R			
Accelerator pedal position signal	T					
Fuel consumption monitor signal	T		R			
A/T warning lamp signal			R			
A/T position indicator signal	R	T	R	R(R range only)	R	
ABS operation signal	R				T	
TCS operation signal	R	R			T	
Air conditioner switch signal	R			T		
Air conditioner compressor signal	R					T
A/C compressor request signal	T					R
Cooling fan motor operation signal	R					T
Cooling fan speed request signal	T					R
Position lights request			R	T		R
Position lights status				R		T
Low beam request				T		R
Low beam status	R			R		T
High beam request			R	T		R
High beam status	R			R		T
Front fog lights request				T		R

Signals	ECM	TCM	COMBINATION METER	BCM	ABS/TCS control unit	IPDM E/R
Front fog light status				R		T
OD cancel switch signal		R	T			R
Brake switch signal		R	T			
Vehicle speed signal	R		T			
	R		T	R		
Oil pressure switch			R			T
Sleep request1			R	T		
Sleep request2				T		R
N range switch signal		R	T			
P range switch signal		R	T			
Seat belt buckle switch signal			T	R		
Door switch signal			R	T		R
Tail lamp request			R	T		R
Turn indicator signal			R	T		
Buzzer output signal			R	T		
Trunk switch signal			R	T		
ASCD main switch signal	T		R			
ASCD cruise signal	T		R			
Wiper operation				R		T
Wiper stop position signal				R		T
Rear window defogger switch signal				T		R
Rear window defogger control signal	R			R		T

FOR A/T MODELS

System Diagram



Input/Output Signal Chart

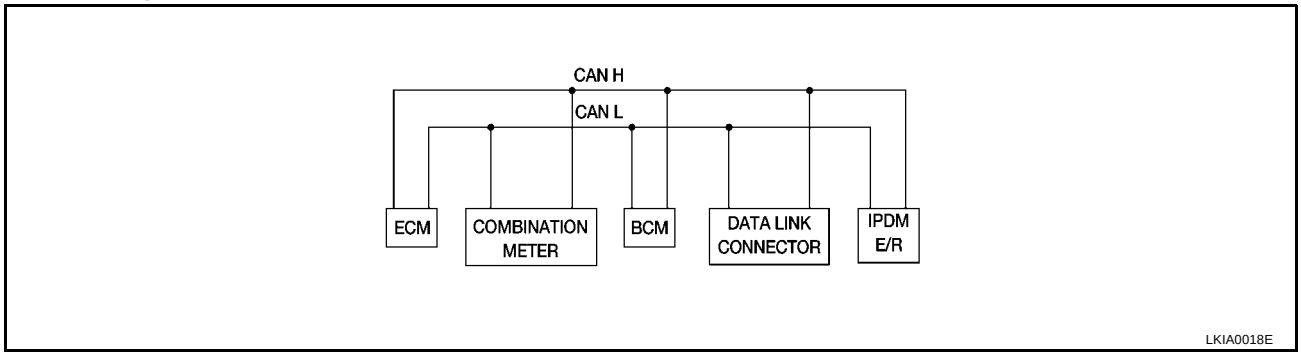
T: Transmit R: Receive

Signals	ECM	TCM	COMBINATION METER	BCM	IPDM E/R
Engine speed signal	T		R		
Engine coolant temperature signal	T		R		
Accelerator pedal position signal	T				R
Fuel consumption monitor signal	T		R		
A/T warning lamp signal		T	R		
A/T position indicator signal	R	T	R	R(R range only)	

Signals	ECM	TCM	COMBINATION METER	BCM	IPDM E/R
Air conditioner switch signal	R			T	
Air conditioner compressor signal	R				T
A/C compressor request signal	T				R
Blower fan switch signal	R(QR25DE)			T	
Cooling fan motor operation signal	R			T	
Cooling fan speed request signal	T				R
Position lights request			R	T	R
Position lights status				R	T
Low beam request				T	R
Low beam status	R			R	T
High beam request			R	T	R
High beam status	R			R	T
Front fog lights request				T	R
Front fog light status				R	T
OD cancel switch signal		R	T		R
Brake switch signal		R	T		
Vehicle speed signal	R		T		
	R		T	R	
Oil pressure switch			R		T
Sleep request1			R	T	
Sleep request2				T	R
N range switch signal		R	T		
P range switch signal		R	T		
Seat belt buckle switch signal			T	R	
Door switch signal			R	T	R
Tail lamp request			R	T	R
Turn indicator signal			R	T	
Buzzer output signal			R	T	
Trunk switch signal			R	T	
ASCD main switch signal	T		R		
ASCD cruise signal	T		R		
Wiper operation				R	T
Wiper stop position signal				R	T
Rear window defogger switch signal				T	R
Rear window defogger control signal	R			R	T

FOR M/T MODELS

System Diagram



Input/Output Signal Chart

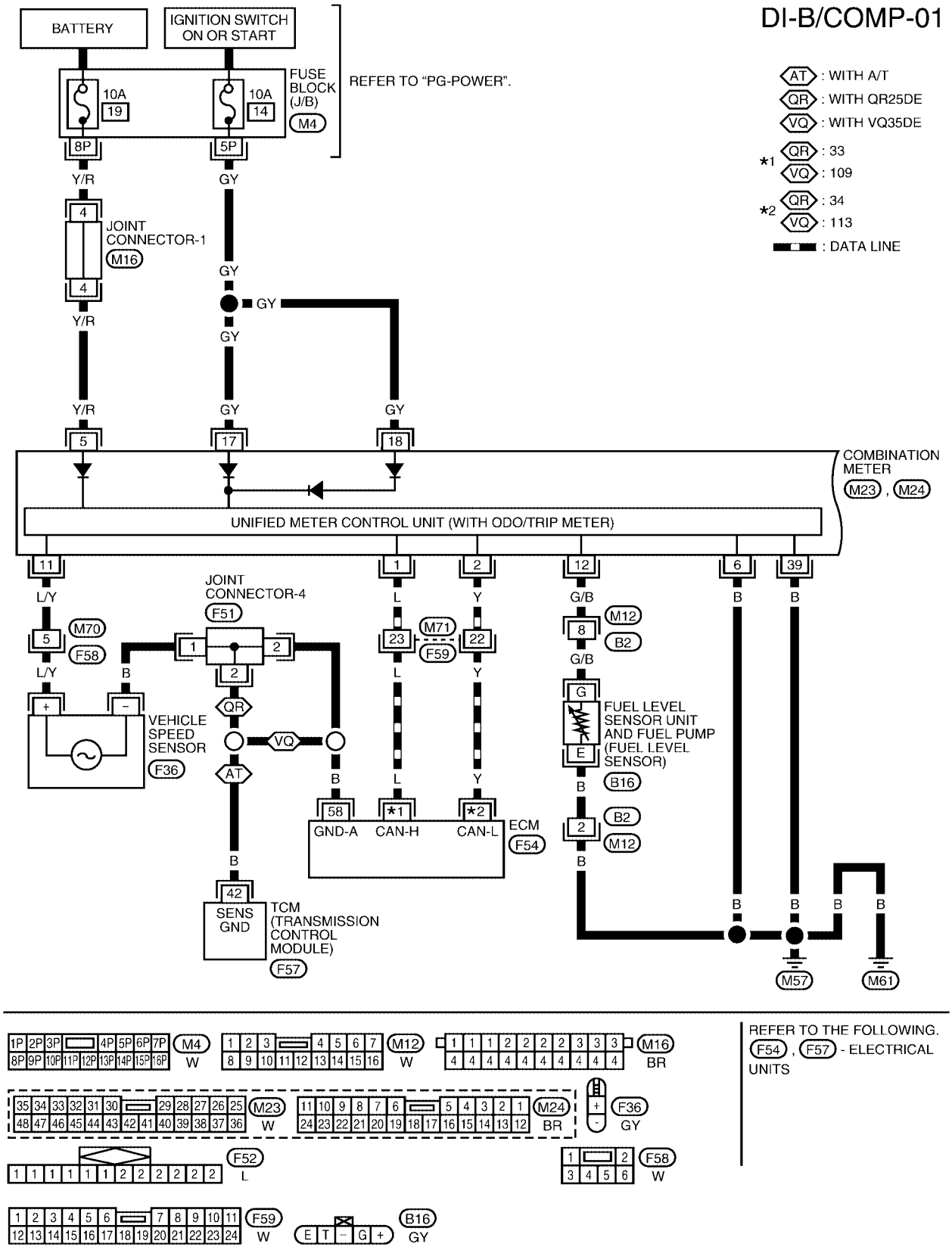
T: Transmit R: Receive

Signals	ECM	COMBINATION METER	BCM	IPDM E/R
Engine speed signal	T			
Engine coolant temperature signal	T			
Fuel consumption monitor signal	T			
Air conditioner switch signal	R		T	
Air conditioner compressor signal	R			T
A/C compressor request signal	T			R
Blower fan switch signal	R(QR25DE)		T	
Cooling fan motor operation signal	R			T
Cooling fan speed request signal	T			R
Position lights request		R	T	R
Position lights status			R	T
Low beam request			T	R
Low beam status	R		R	T
High beam request		R	T	R
High beam status	R		R	T
Front fog lights request			T	R
Front fog light status			R	T
Vehicle speed signal	R	T		
Oil pressure switch		R		T
Sleep request1		R	T	
Sleep request2			T	R
Seat belt buckle switch signal		T	R	
Door switch signal		R	T	R
Tail lamp request		R	T	R
Turn indicator signal		R	T	
Buzzer output signal		R	T	
Trunk switch signal		R	T	
ASCD main switch signal	T	R		
ASCD cruise signal	T	R		
Wiper operation			R	T
Wiper stop position signal			R	T

Signals	ECM	COMBINATION METER	BCM	IPDM E/R
Rear window defogger switch signal			T	R
Rear window defogger control signal	R		R	T

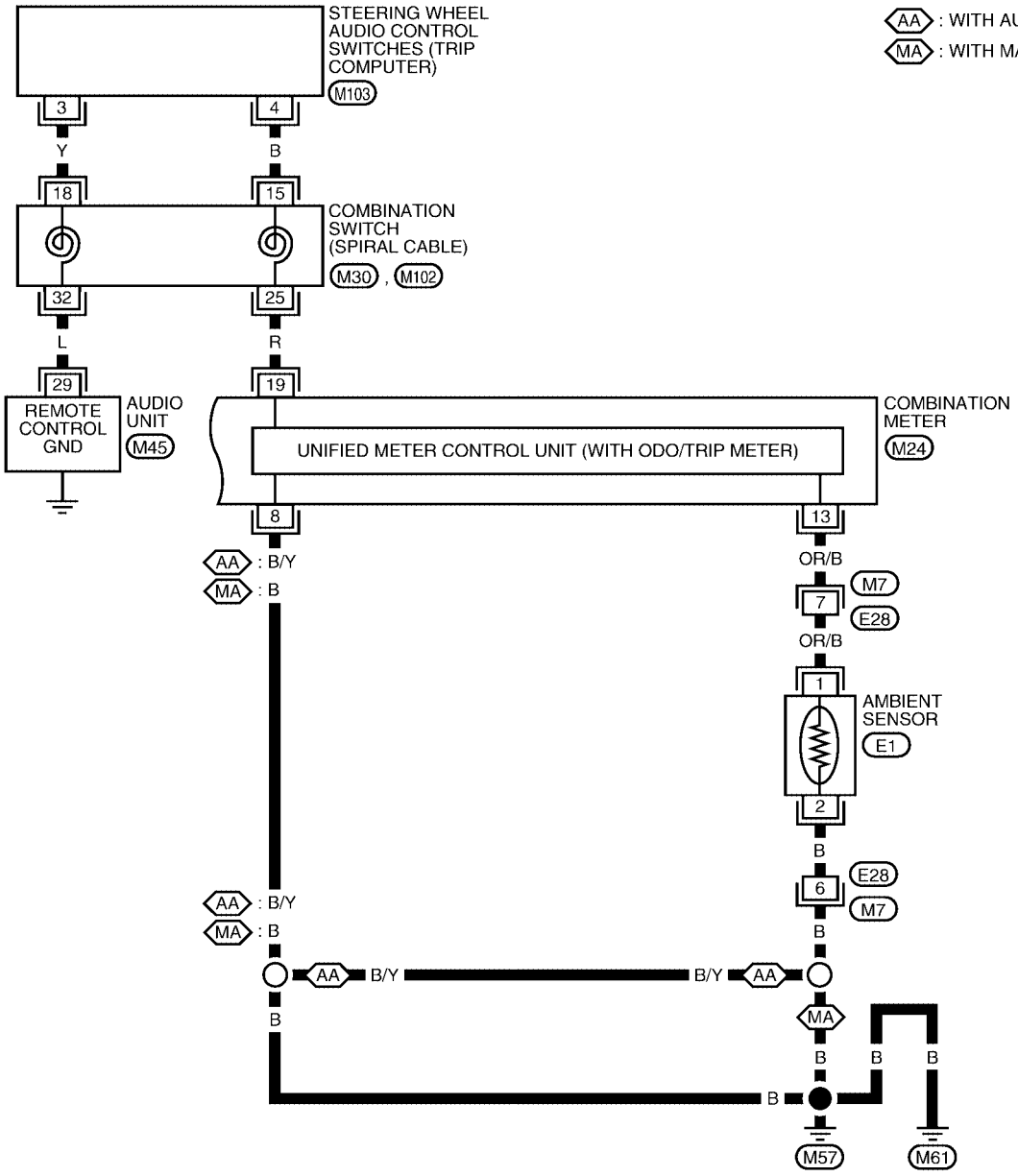
Wiring Diagram — B/COMP —

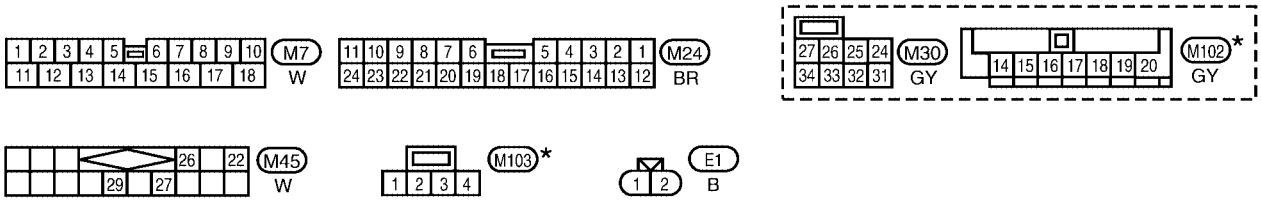
EKS002IE



LKWA0073E

DI-B/COMP-02





* This connector is not shown in "HARNESS LAYOUT" of PG section.

LKWA0074E

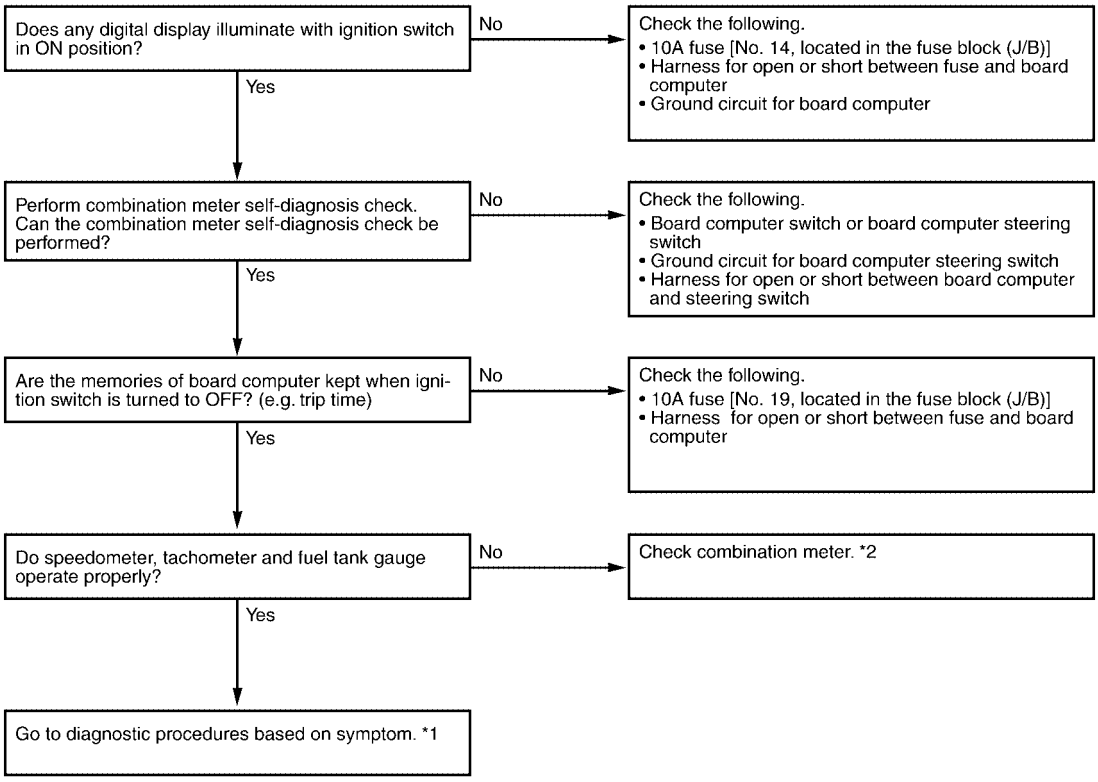
Trouble Diagnoses

EKS002IF

SEGMENT CHECK

The board computer segment display can be checked by entering combination meter self-diagnostic mode. Refer to DI-13, "SELF–DIAGNOSIS FUNCTION" .

PRELIMINARY CHECK



LKIA0061E

*1 DI-67, "DIAGNOSIS PROCEDURE" *2 DI-10, "CHECK"

DIAGNOSIS PROCEDURE

Symptom	Possible cause	Repair order
Outside air temperature display is not displayed properly. (It may take a short time to steady the indication after ignition switch is turned ON.) **NOTE:** If the meter is powered up with the ambient sensor disconnected, outside air temperature display will show "---" even if the sensor is reconnected. In this case, with the sensor connected, disconnect and reconnect the battery, then the correct temperature will be displayed.	1. Ambient sensor 2. Ambient sensor circuit 3. Vehicle speed sensor signal	1. Check ambient sensor. 2. Check harness for open or short between ambient sensor and board computer. 3. Check harness for open or short between combination meter terminal 11 and vehicle speed sensor.
DTE (distance to empty) is not displayed properly.)	1. Average fuel consumption display 2. Fuel tank gauge signal circuit.	1. Make sure fuel consumption is displayed properly. If NG, check fuel consumption display. 2. Make sure fuel gauge operates properly. If NG, check fuel gauge.
Trip distance is not indicated properly.	1. Vehicle speed sensor signal circuit	1. Check harness for open or short between combination meter terminal 11 and vehicle speed sensor.

Symptom	Possible cause	Repair order
Trip time is not indicated properly.	1. Fuse	1. 10A fuse [No. 19 (located in fuse block (J/B)]. Verify battery voltage is present at combination meter terminal 5.
Average fuel consumption is not displayed properly.	1. Trip distance display 2. Fuel consumption signal	1. Check harness for open or short between combination meter terminal 11 and vehicle speed sensor. 2. Check CAN lines for open or short between ECM and combination meter.
Average vehicle speed is not indicated properly.	1. Trip distance display 2. Trip time display	1. Check harness for open or short between combination meter terminal 11 and vehicle speed sensor. 2. Make sure trip time is displayed properly. If NG, check trip time display.

Electrical Components Inspection

EKS002IG

AMBIENT SENSOR

After disconnecting ambient sensor harness connector, measure resistance between terminals 2 and 1 at sensor harness side, using the table below.

Temperature °C (°F)	Resistance kΩ
-15 (5)	12.73
-10 (14)	9.92
-5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07

If NG, replace ambient sensor.