TO INDEX

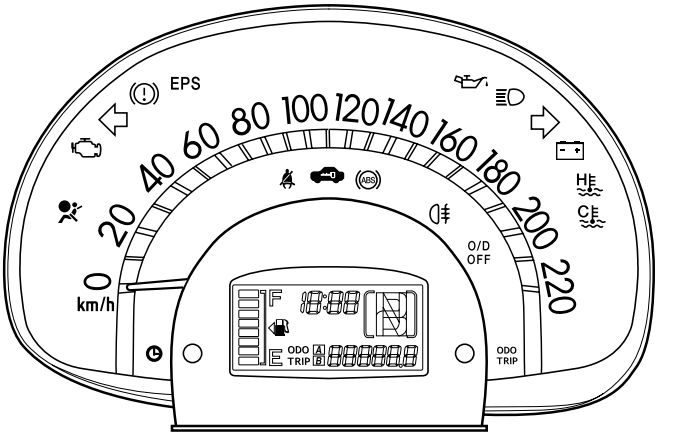
J3 METER

1 OUTLINE

1-1 DESCRIPTION

1.The designing and legibility have been enhanced by positioning the meter on the upper part of the steering column.
2.Legibility and visibility have been enhanced by employing the letter size which provides comprehensibility and easy reading.
3.As for the odometer · trip meter, electric type odometer · trip meter equipped with a twin trip meter has been employed.
4.A tachometer is available on some Specifications. The tachometer is separate from the combination meter and is positioned on the upper part of the instrument panel.
5.For some of the communications of the meter and other ECU, multiplex communication of CAN (Controller Area Network) and LIN (Local Interconnect Network) has been employed.
6.A clock is set within the meter.
7.An excellent visibility is achieved by indicating fuel gauge, odometer · trip meter, shift position indicator and clock in LCD (Liquid Crystal Display).
8.A multi-buzzer that makes a buzzer sound while various warnings are given such as when the key is remaining in the key cylinder, or when reversing has been employed and is built in the meter.
9.Fuel level warning function has been employed for all models.
10.Power saving and long lasting features have been promoted by employing LED for all lightings such as the dial plate and the indicator lamps.

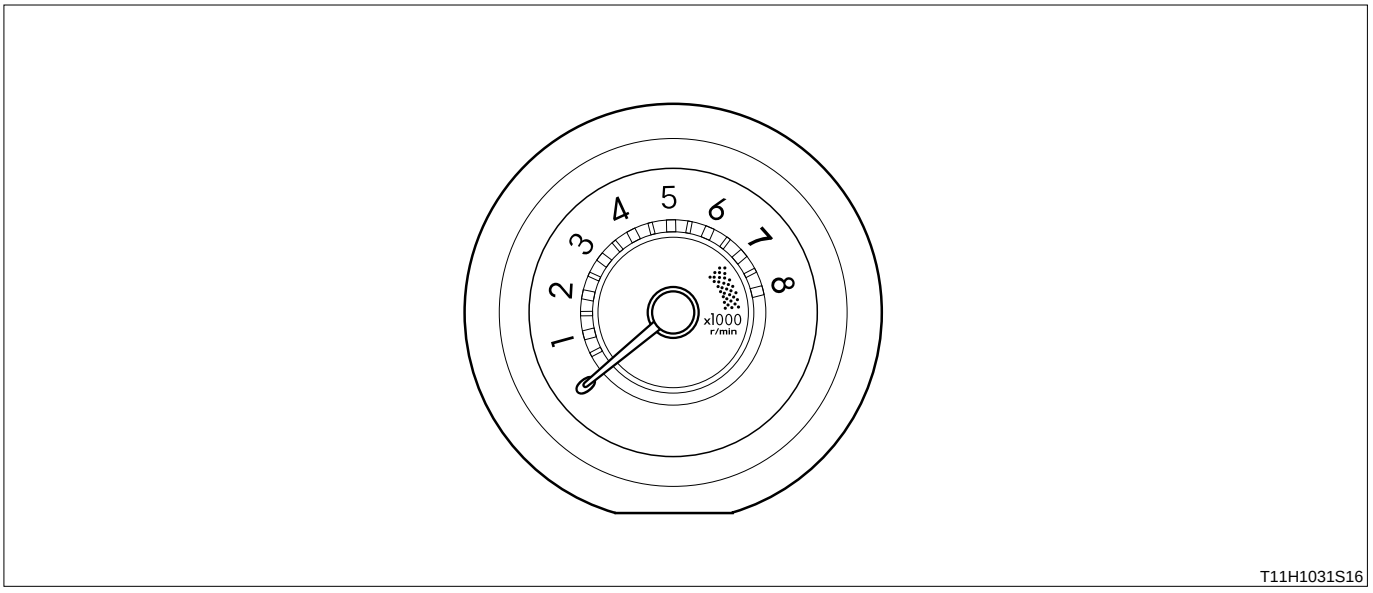
Combination meter



T11H1526S16

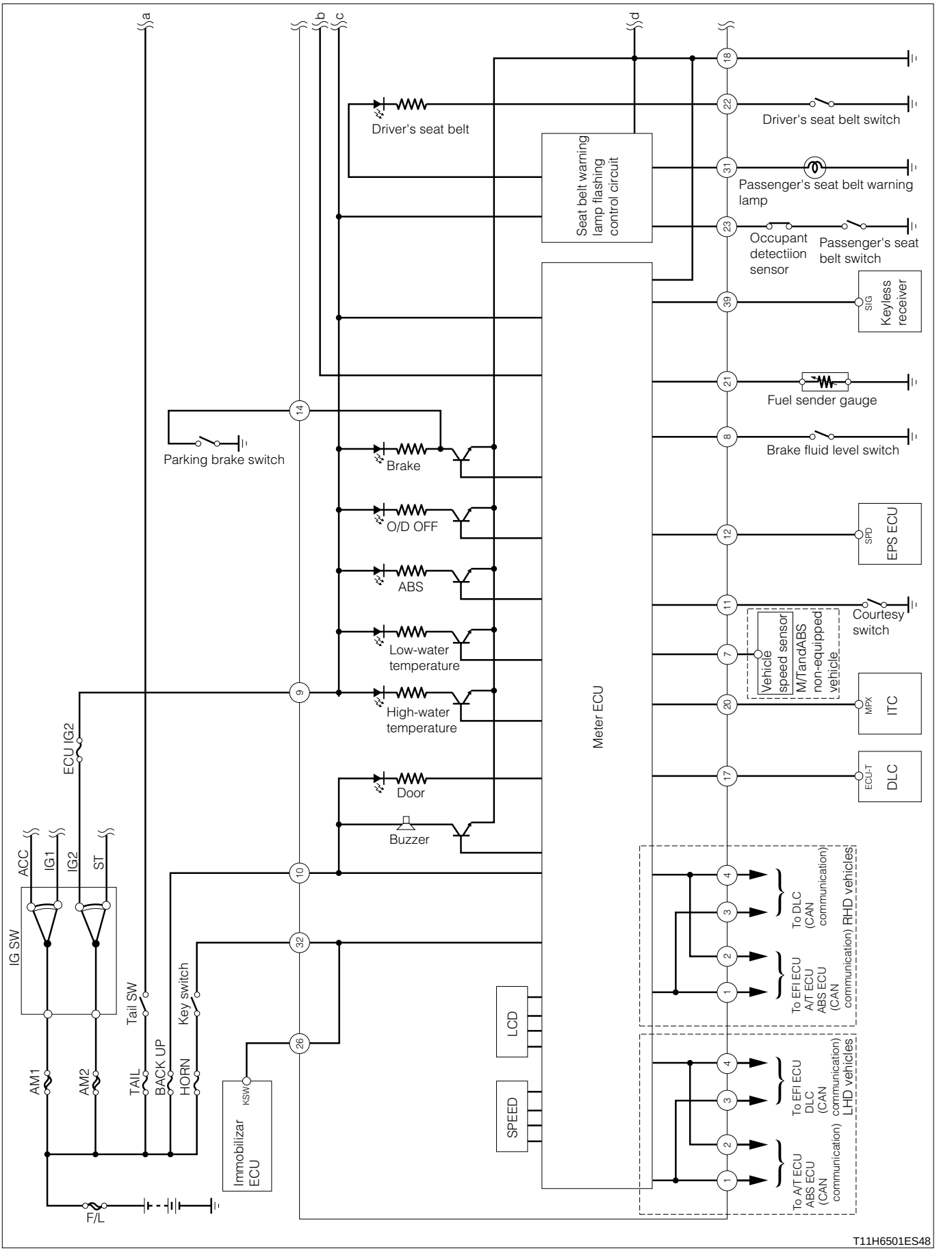
The illustration represents a major example.

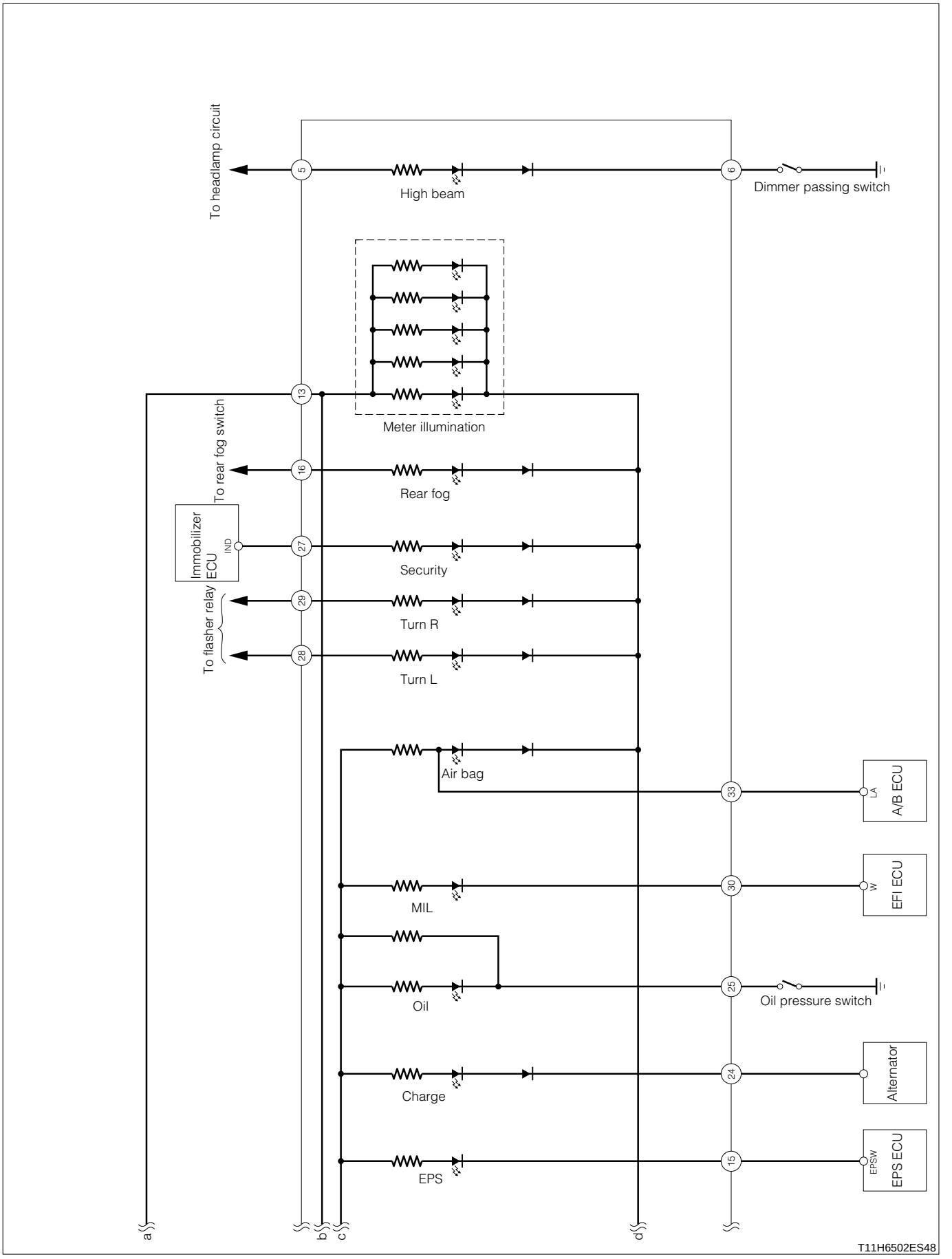
Tachometer



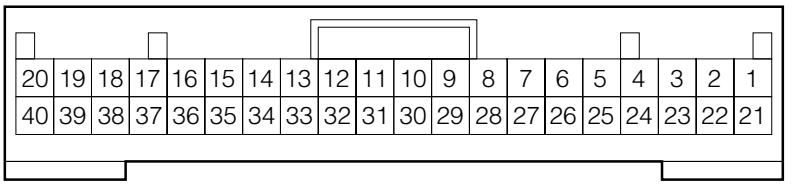
1-2 SYSTEM WIRING DIAGRAM

1-2-1 COMBINATION METER




To headlamp circuit
5
High beam
6
Dimmer passing switch
13
Meter illumination
To rear fog switch
16
Rear fog
Immobilizer ECU
IND
27
Security
To flasher relay
29
Turn R
28
Turn L
Air bag
33
LA
A/B ECU
MIL
30
W
EFI ECU
Oil
25
Oil pressure switch
Charge
24
Alternator
EPS
15
EPSW
EPS ECU
a
b
c
d
T11H6502ES48

Arrangement of meter terminal

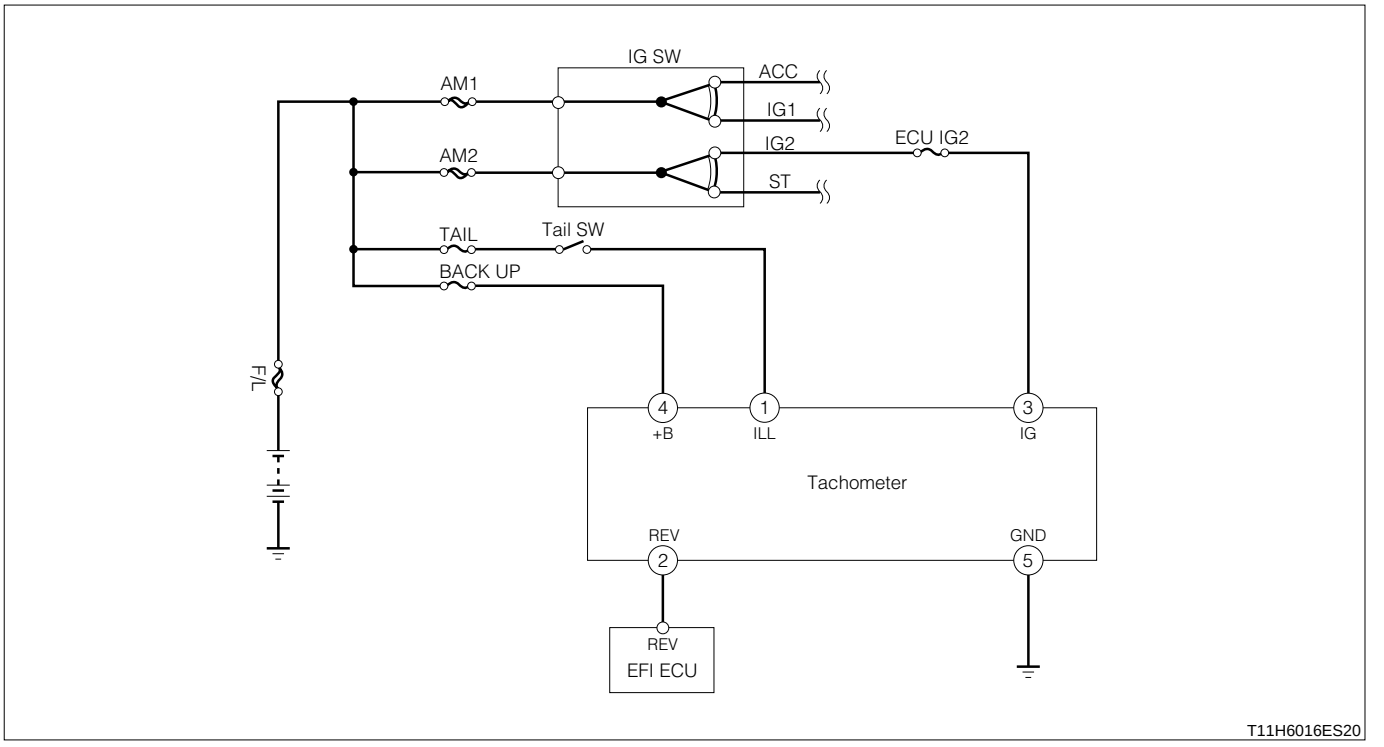


T11H6013S10

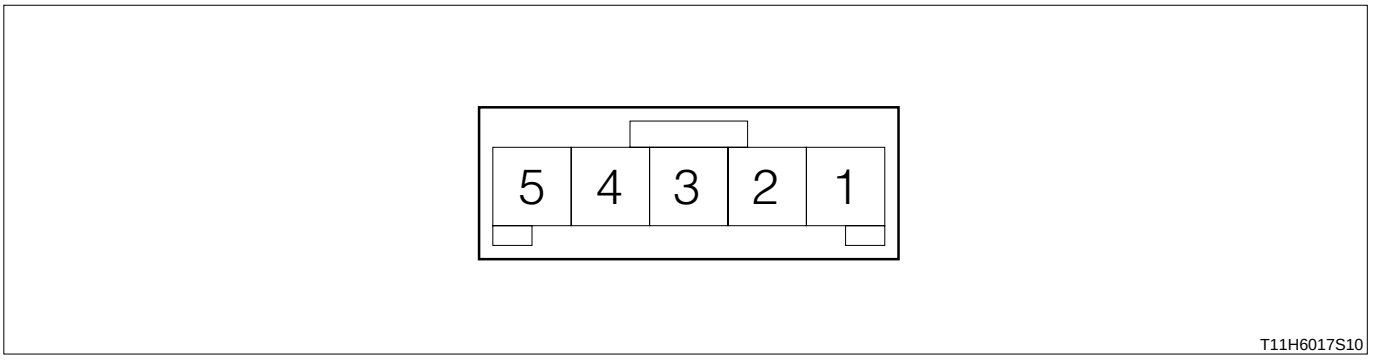
Meter terminal name

Terminal No.	Terminal code	Terminal name
1	CANH	CAN communication HI (1)
2	CANL	CAN communication LO (1)
3	HCAN	CAN communication HI (2)
4	LCAN	CAN communication LO (2)
5	BEAM+	High beam +
6	BEAM−	High beam −
7	SPD	Input of vehicle speed signal
8	BRK	Input of brake fluid signal
9	IG2	IG power supply
10	+B	+B power supply
11	DOOR	Input of courtesy switch signal
12	SPOUT	Output of vehicle speed signal
13	TAIL	Illumination +
14	PKBSW	Parking brake
15	EPS	EPS
16	RR-FOG	Rear fog lamp
17	ECU-T	ECU-T terminal signal input
18	GND	Earth
19	—	—
20	LIN	LIN communication input/output
21	FUEL	Input of fuel signal
22	D-BELT	Seat belt at driver's seat side
23	P-BELT	Front passenger seat side seat belt signal input
24	CHG	Charge
25	OIL	Oil
26	KEY2	Output of key switch signal
27	SEC	Security
28	TURNL	Turn LH
29	TURNR	Turn RH
30	MIL	MIL
31	P-BELOUT	Front passenger seat side seat belt signal output
32	KEY	Input of key switch signal
33	A/B	Airbag
34	—	—
35	—	—
36	—	—
37	—	—
38	—	—
39	KLS	Keyless receiver signal input
40	—	—

1-2-2 TACHOMETER



Arrangement of tachometer terminal



Tachometer terminal name

Terminal No.	Terminal code	Terminal name
1	ILL	Illumination
2	REV	Input of engine revolution speed signal
3	IG	IG power supply
4	+B	+B power supply
5	GND	Earth

2 CONSTRUCTION AND OPERATION

2-1 SPEEDOMETER

2-1-1 DESCRIPTION

1.For the speedometers, the electric type has been employed for all models.

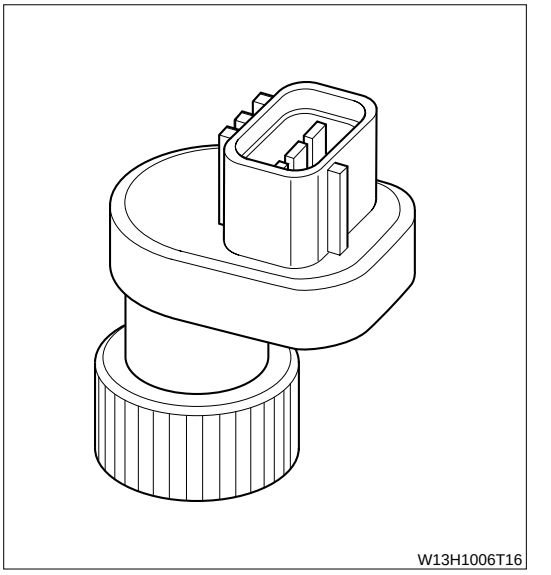
2-1-2 SPECIFICATIONS

Indication	Function
Indication range: 0 - 220 km/h 0 - 140 MPH At increments of 10 km/h At increments of 10 MPH	Electric type (pointer: stepper motor type) Vehicle speed signal source: ABS ECU [ABS-equipped vehicles] A/T ECU [A/T vehicles without ABS] Vehicle speed sensor (MRE type) [M/T vehicles without ABS] Meter output vehicle speed pulse: 4 pulse/rev (42.47 Hz [at 60 km/h]) 4 pulse/rev (68.33 Hz [at 60 MPH]) The vehicle speed is indicated by inputting the vehicle speed signal from the ABS ECU over the CAN communication and processing the signal at the meter ECU. (ABS-equipped vehicles) The vehicle speed is indicated by inputting the vehicle speed signal from the A/T ECU over the CAN communication and processing the signal at the meter ECU. (A/T vehicles without ABS) The vehicle speed is indicated by inputting the vehicle speed signal from the vehicle speed sensor (MRE type) and processing the signal at the meter ECU. (M/T vehicles without ABS)

2-1-3 VEHICLE SPEED SENSOR (MRE TYPE)

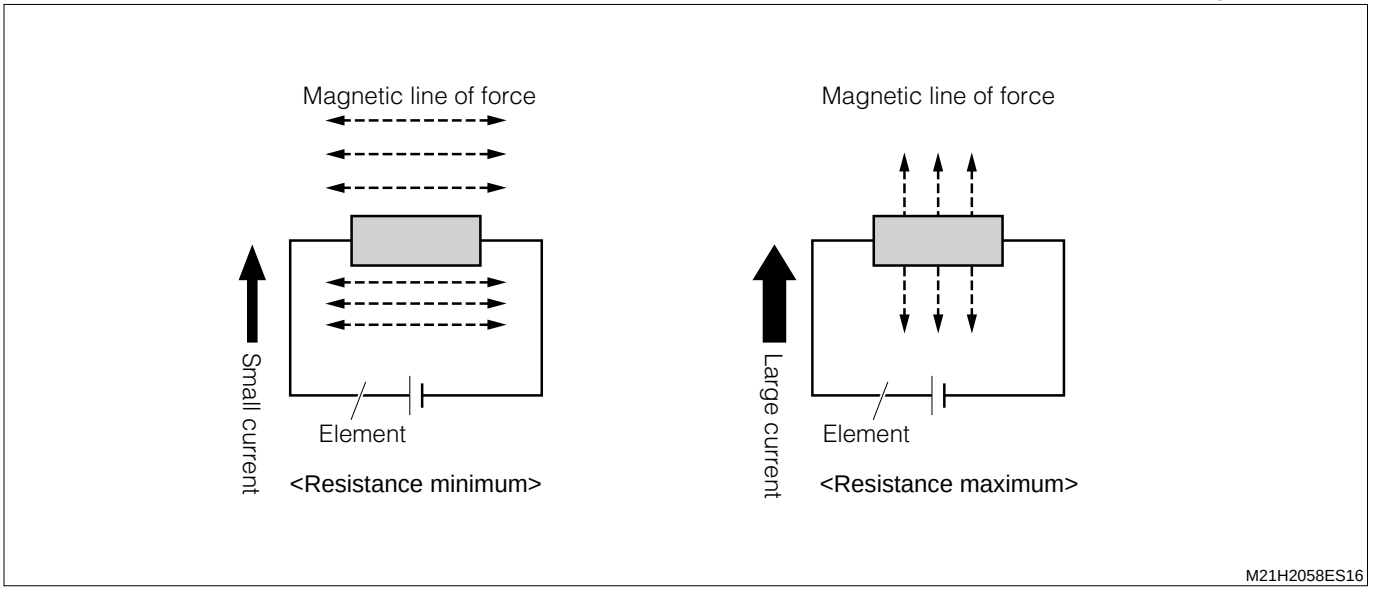
(1) Description

1.A MRE type (MRE: Magnetic Resistance Element) vehicle speed sensor has been set in the ABS non-installed M/T vehicle as the vehicle speed signal detection sensor.
2.The vehicle speed sensor is installed to the transaxle.
3.The vehicle speed is detected by the rotating gear of the vehicle speed sensor.

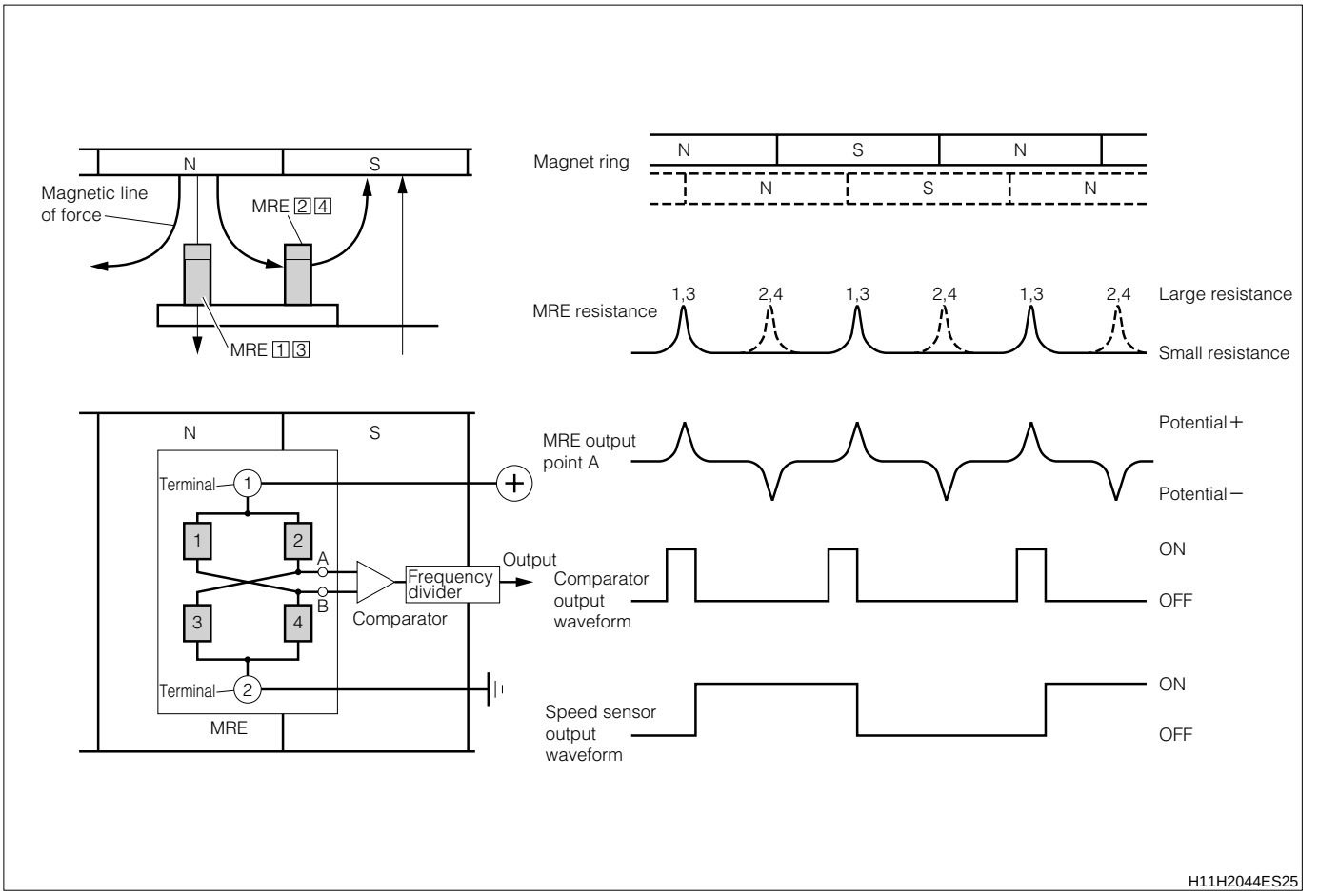


(2) Construction and operation

1.The resistance of the MRE becomes maximum when the direction of the electric current flowing in the element becomes parallel to the direction of the line of magnetic force. Conversely, the resistance becomes minimum when the electric current intersects with the direction of the line of magnetic force.



2.The direction of the line of magnetic force is determined by the rotation of the magnetized eight-pole magnet in the magnet ring. The MRE output becomes an eight-cycle alternating waveform per rotation of the magnet ring. The comparator converts these waveforms into eight-pulse short waveforms and the divider transforms them into four cycles. Finally, it will be outputted to the combination meter.



2-2 TACHOMETER

2-2-1 DESCRIPTION

1.A tachometer is available in some Specifications.

2.The revolution signal detected by the engine revolution speed sensor and converted by the EFI ECU is inputted. Then the tachometer counts the pulse signals and performs calculation and finally indicates the engine revolution speed.

2-2-2 SPECIFICATIONS

Indication	Function
Indication range: 0 - 8400 rpm (Red zone: 6800 - 8400 rpm)	Electric type (pointer: stepper motor type) Revolution signal source: EFI ECU Number of input pulses: 2pulse/rev (100 Hz at 3000 rpm) The pulse signal from the EFI ECU is inputted. Then, the tachometer counts the pulse signals and performs calculation and finally indicates the engine revolution speed.

2-3 ODOMETER TRIP METER

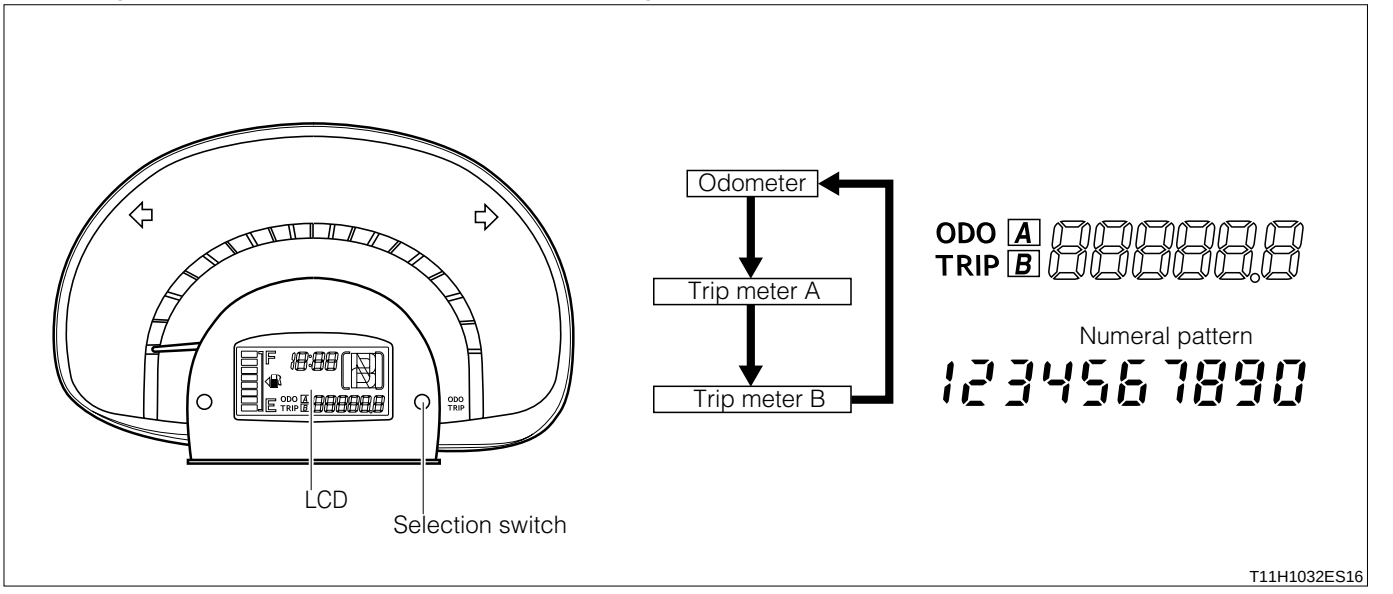
2-3-1 DESCRIPTION

1.An excellent visibility is achieved by employing an odometer · trip meter with LCD (Liquid Crystal Display) indication.

2.As for the odometer · trip meter, an electric type odometer · trip meter equipped with a twin trip meter has been employed.

3.The changing of each mode is done by pressing the selection switch at the right of the speedometer. Indications are made in the order of odometer→trip meterA→trip meter B→odometer.

4.The figure of the trip meter is reset by pressing the selection switch for more than about one second.



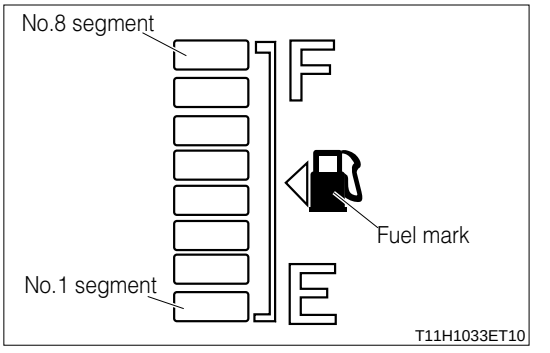
2-3-2 SPECIFICATIONS

Indication	Function
Digital indication by LCD Indication range: Odometer: 0 - 999999 km 0 - 999999 MILE Trip meter A · B: 0 - 9999.9 km 0 - 9999.9 MILE	LCD type Mileage signal source: ABS ECU [ABS-equipped vehicles] A/T ECU [A/T vehicles without ABS] Vehicle speed sensor (MRE type) [M/T vehicles without ABS] The running distance is indicated by inputting the running distance signal from the ABS ECU over the CAN communication and processing the signal at the meter ECU. (ABS-equipped vehicles) The running distance is indicated by inputting the running distance signal from the A/T ECU over the CAN communication and processing the signal at the meter ECU. (A/T vehicles without ABS) The running distance is indicated by inputting the running distance signal from the vehicle speed sensor (MRE type) and processing the signal at the meter ECU. (M/T vehicles without ABS) The backward moving distance is also added. By pressing the selection switch, indications are made in the order of odometer→trip meter A →trip meter B. By pressing the selection switch for more than about one second, the figure of the trip meter is reset.

2-4 FUEL GAUGE

2-4-1 DESCRIPTION

1. An excellent visibility is achieved by indicating fuel gauge in LCD (Liquid Crystal Display).
2. The meter ECU calculates the accurate fuel level by calculating the average data of a certain period of time based on the level signal from the fuel sender gauge.
3. The Fuel gauge indicates the fuel level by turning on/off of the eight segments in the bar graph.



2-4-2 SPECIFICATIONS

Indication	Function
Digital indication by LCD (Liquid Crystal Display) Indicated by 8 segment bar graph. Indication range: E - F	The fuel level is indicated by inputting the fuel sender gauge voltage and calculating at the meter ECU. No.1 segment (bottom position) blinks when No.2 segment is turned off (when fuel level is about 6ℓ).

2-4-3 FUEL LEVEL INDICATION FUNCTION

The meter ECU indicates the corresponding LCD segments by calculating the average data of a certain period of time based on the level signal from the fuel sender gauge.

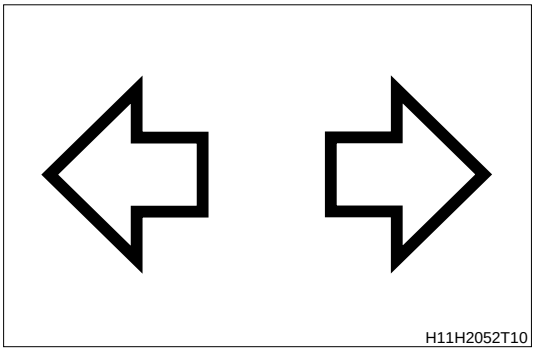
2-4-4 FUEL LEVEL WARNING FUNCTION

The driver is warned by the No.1 segment (bottom position) blinking when No.2 segment is turned off (when the fuel level is about 6ℓ).

2-5 WARNING / INDICATOR

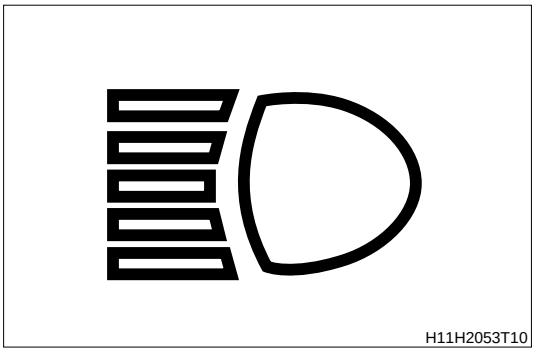
2-5-1 TURN

1.A turn indicator has been set in the meter.
2.It blinks when the turn signal switch and the hazard switch are "ON".


H11H2052T10

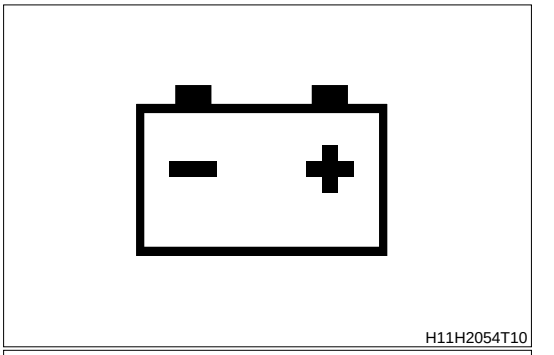
2-5-2 HIGH-BEAM

1.A high-beam indicator is set in the meter.
2.It is lighted when the headlamp is set at high-beam or passing.


H11H2053T10

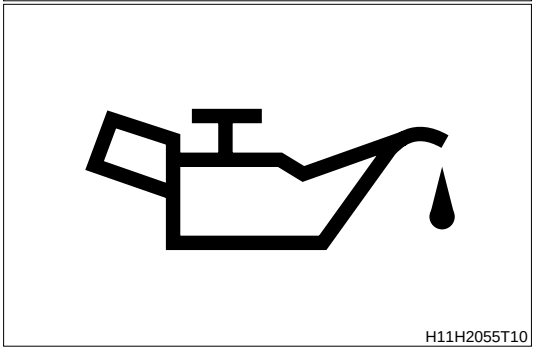
2-5-3 CHARGE

1.A charge warning lamp is set in the meter.
2.If the charging system is normal, it is lighted when the IG switch is turned "ON" and is turned off when the engine is started.
3.It is constantly lighted when there is an abnormality in the system.


H11H2054T10

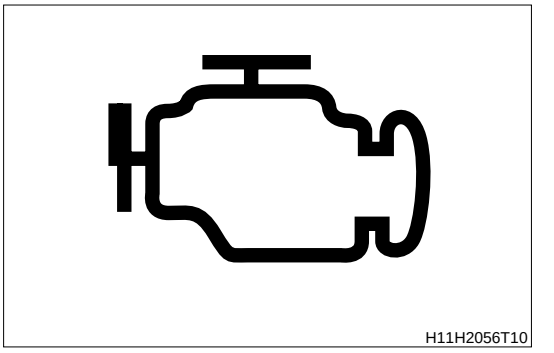
2-5-4 OIL

1.An oil warning lamp has been set in the meter.
2.It is lighted when the oil pressure switch is "ON" and is turned off when the engine is started.
3.It is constantly lighted when the oil pressure is low.


H11H2055T10

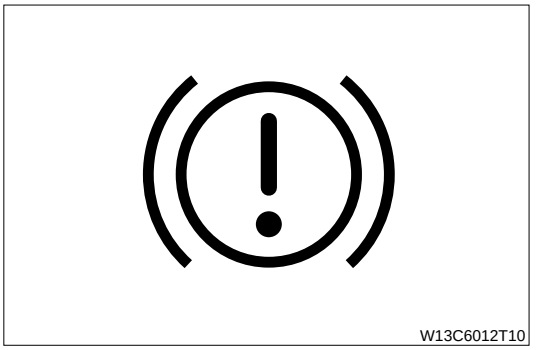
2-5-5 MIL

1.If the engine control system is normal, it is lighted when the IG switch is turned "ON" and is turned off when the engine is started.
2.It is constantly lighted when there is an abnormality in the system.
3.The diagnosis code of the engine control system is outputted.


H11H2056T10

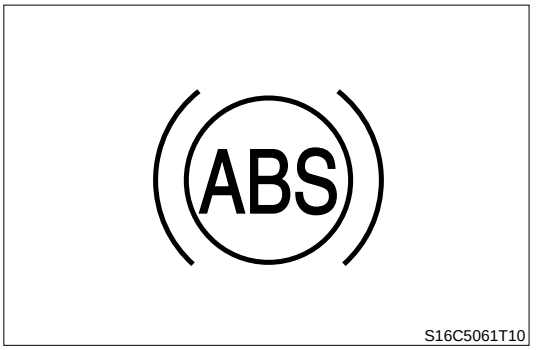
2-5-6 BRAKE

1.A brake warning lamp has been set in the meter.
2.If the system is normal, it is lighted when the IG switch is turned "ON" and is turned off three seconds later under the condition in which the parking brake is not operating.
3.It is lighted when the parking brake switch or the brake fluid level switch is "ON".
4.It is constantly lighted when there is an abnormality in the ABS.


W13C6012T10

2-5-7 ABS

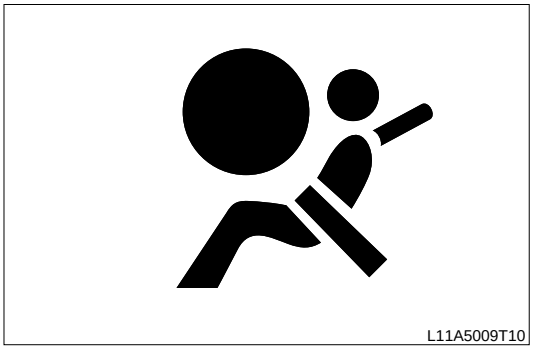
1.An ABS warning lamp has been set in the meter.
2.If the system is normal, it is lighted when the IG switch is turned "ON" and is turned off about three seconds later.
3.It is constantly lighted when there is an abnormality in the system.
4.The diagnosis code of the ABS is outputted.



S16C5061T10

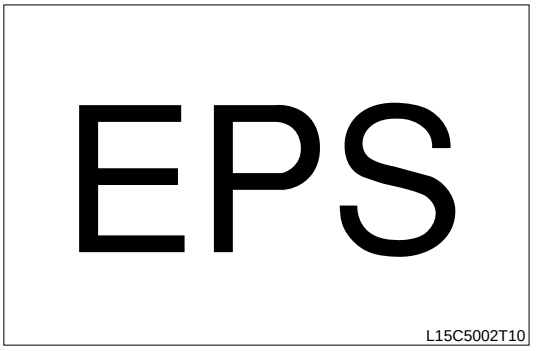
2-5-8 AIRBAG

1.An airbag warning lamp has been set in the meter.
2.If the system is normal, it is lighted when the IG switch is turned "ON" and is turned off about six seconds later.
3.It is constantly lighted when there is an abnormality in the system.
4.The diagnosis code of the airbag system is outputted.


L11A5009T10

2-5-9 EPS

1.An EPS warning lamp has been set in the meter.
2.If the system is normal, it is lighted when the IG switch is turned "ON" and is turned off two seconds later.
3.It is constantly lighted when there is an abnormality in the system.
4.The diagnosis code of the EPS system is outputted.



L15C5002T10

2-5-10 HIGH WATER TEMPERATURE/LOW WATER TEMPERATURE

1.A high water temperature warning lamp and low water temperature indicator lamp have been set in the meter.

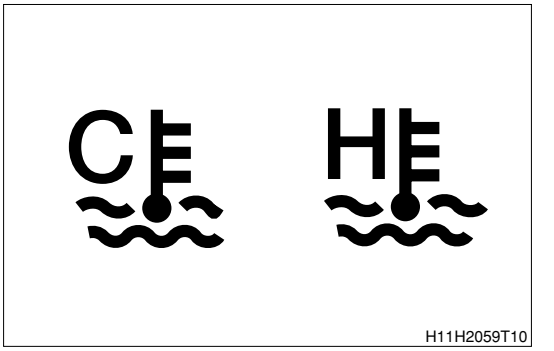
2.If the system is normal, the high temperature warning lamp and low temperature indicator lamp are lighted when the IG switch is turned "ON" and are turned off about three seconds later under the condition in which the water temperature is neither high or low.

NOTE

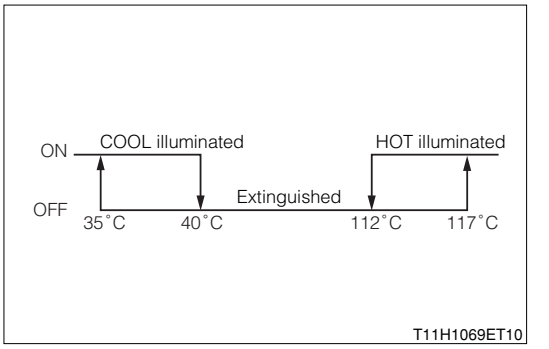
- Even if the IG switch is turned "ON" when the engine water temperature is low, the high water temperature warning lamp is lighted for about three seconds for initial check. In that case, the low water temperature indicator lamp is also lighted and will continue to be lighted after three seconds until the engine water temperature becomes high.

3.The high water temperature warning lamp blinks when the water temperature is about 117˚C or above and is turned off when it is about 112˚C or below.

4.The low water temperature indicator lamp is lighted when the water temperature is about 35˚C or below and is turned off when it is about 40˚C or above.



H11H2059T10



T11H1069ET10

2-5-11 SEAT BELT

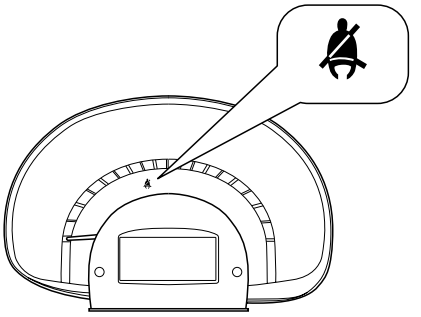
(1) Description

1.A blinking type seat belt warning lamps have been set to the driver seat and the passenger seat according to the specifications. As for the position of the warning lamp, the one of the driver seat is set in the meter and the other for the passenger seat is set in the air conditioner control panel.

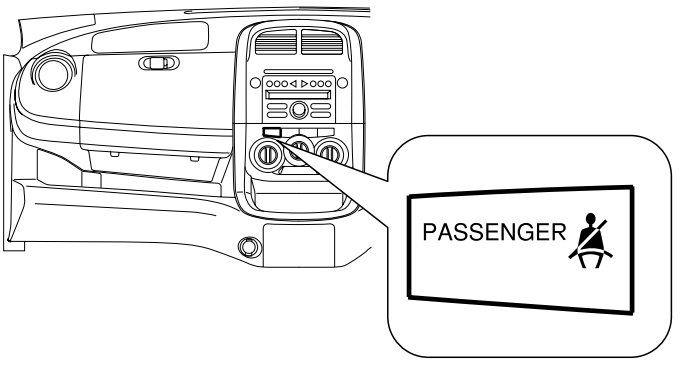
2.The driver seat belt warning lamp blinks if the seat belt is not fastened on the driver seat.

3.As for the front passenger seat belt warning lamp, it blinks if the seat belt is not fastened on the front passenger seat when there is somebody seated on the passenger seat.

4.A passenger detection sensor which detects if the passenger is seated or not has been set below the skin of the front passenger seat cushion.



Driver's seat belt warning



Front passenger seat belt warning

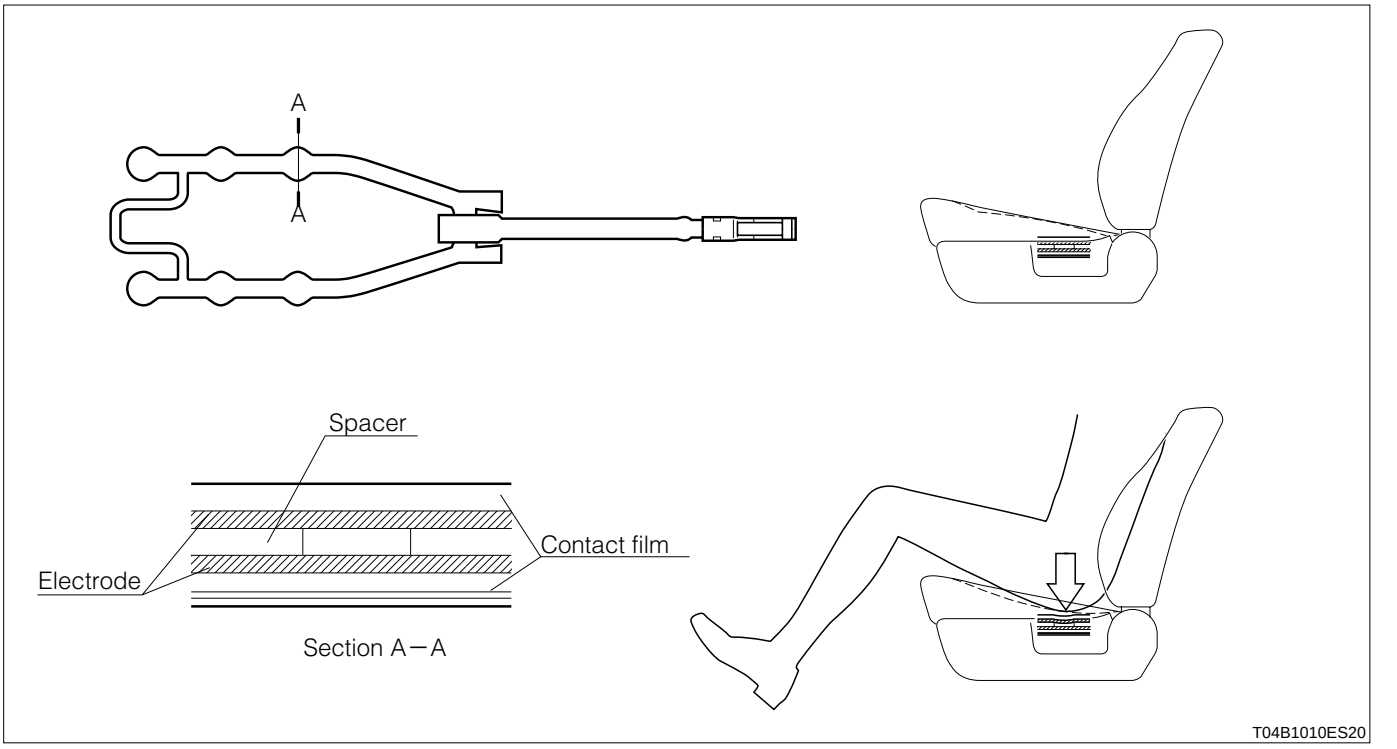
T11H1034ES16

(2) Passenger detection sensor structure

When the IG switch is "ON" and a passenger seats on the front passenger seat, the electrodes of the sensor have contact and let the warning lamp blink. Then, when the passenger seat belt is fastened, the seat belt switch is turned "OFF" and the warning lamp is turned off.

NOTE

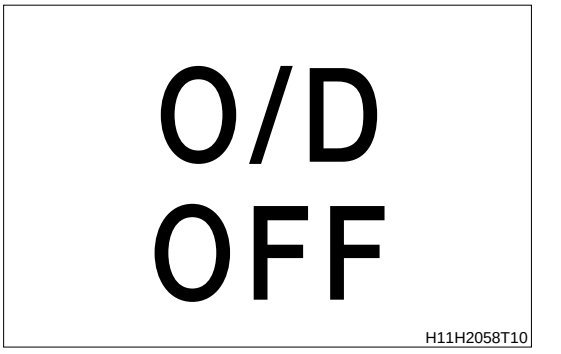
- If a load above a certain level is applied to the seat cushion such as in the case of placing luggage on the passenger seat cushion, the sensor may detect this.



T04B1010ES20

2-5-12 O/D OFF

1.An O/D OFF indicator has been set in the meter.
2.It is lighted when the O/D is "OFF".
3.It blinks when there is an abnormality in the transmission control system.
4.The diagnosis code of the transmission control system is outputted.



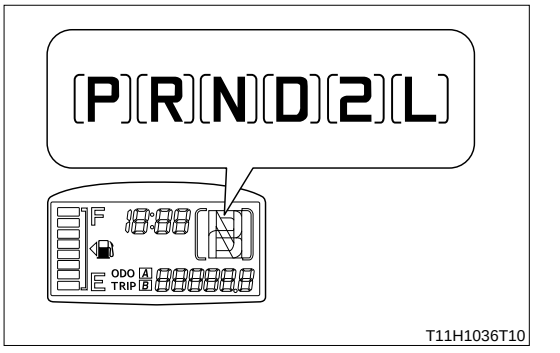
H11H2058T10

2-5-13 SHIFT POSITION

1.A shift position indicator has been set in the LCD of the meter.
2.The present shift position is indicated.

NOTE

- The frame indication blinks corresponding to the buzzer interval during R range indication.



T11H1036T10

2-5-14 SECURITY

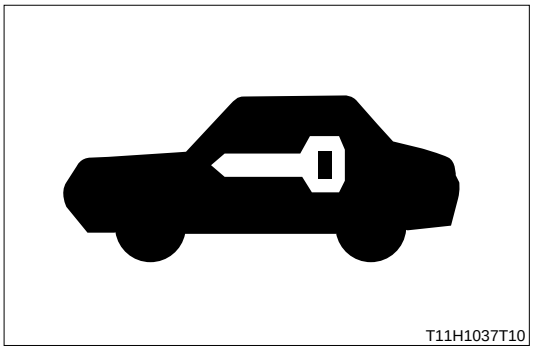
1.A security indicator has been set in the meter.

NOTE

- Please refer to the pages of the immobilizer system for details concerning lighting conditions.

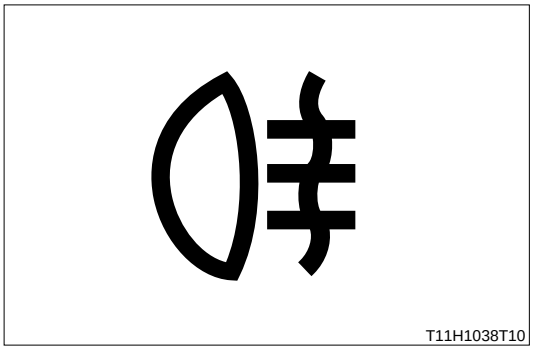
Refer to Page I4-13.

2.The diagnosis code of the immobilizer system is outputted.


T11H1037T10

2-5-15 REAR FOG LAMP

1.A rear fog lamp indicator has been set in the meter.
2.It is lighted when the rear fog lamp is lighted.


T11H1038T10

2-6 WARNING BUZZER

2-6-1 DESCRIPTION

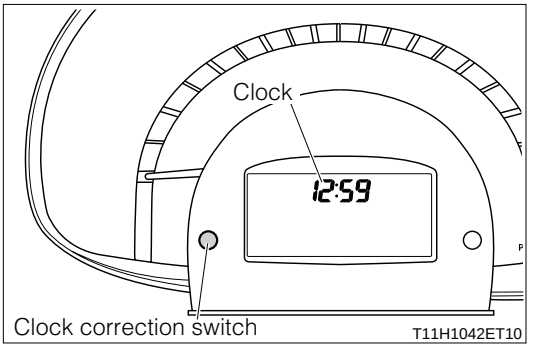
1.A multi-buzzer is employed and incorporated in the meter. This multi-buzzer sounds while various warnings are given such as when the key is remaining in the key cylinder, or when the reverse gear is selected.

2-6-2 SPECIFICATIONS

Category	Function
Key remaining in key cylinder Light remaining to be illuminated Reverse Seat belt remaining (Europe specification) Vehicle speed warning (Some specifications)	Warnings and abnormalities of each system are notified by sound.

2-7 CLOCK

1.A digital clock by LCD (Liquid Crystal Display) indication has been employed.
2.An excellent usability has been achieved by setting the installation position in the meter.
3.A clock adjusting switch to adjust the time has been set on the left side of the clock.



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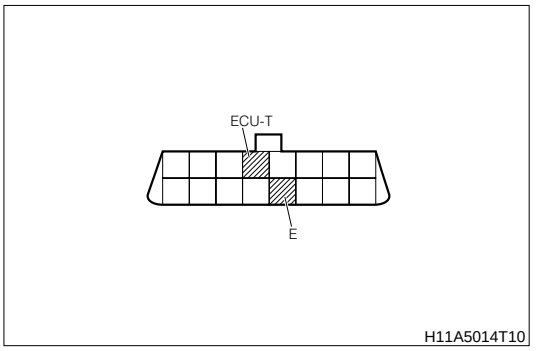
2-8 WATER TEMPERATURE INDICATION FUNCTION

2-8-1 DESCRIPTION

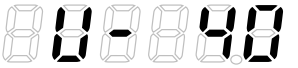


1.The water temperature may be indicated on LCD (Liquid Crystal Display) by the following procedures.
(1) Turn "ON" the IG switch.
(2) Short the terminal ECU-T and terminal E of the DLC.
(3) Press on the selection switch for about a second.

CAUTION

- If the vehicle is driven with the terminal ECU-T ad terminal E of the DLC in the above (2) short-circuited, the figures on the liquid crystal display will remain to indicate the water temperature until the vehicle speed is above 8km/h and thus the odometer · trip meter cannot be seen. Please remove the short circuit between the terminal ECU-T and terminal E when the operation is finished.

2.The temperature indicated on the LCD (Liquid Crystal Display) is from 40□ to 130□ with 1□ intervals.

Water temperature	40˚C or less	108˚C	130˚C or more
Indication example			

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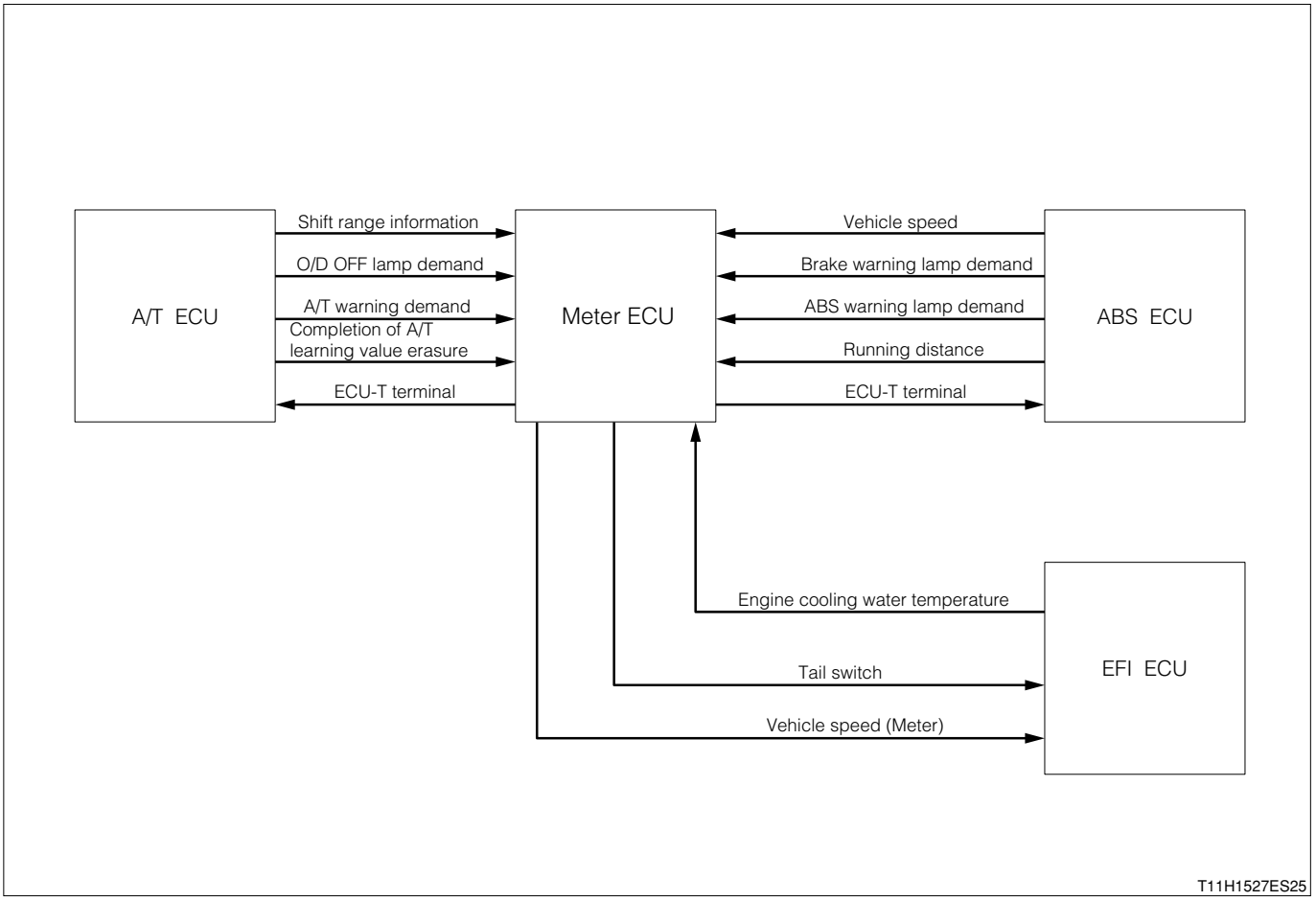
2-9 CAN COMMUNICATION

For the meter ECU in the meter, CAN communication is employed for some of the communications with other ECU's.
Please refer to the pages of the CAN communication system for the CAN communication.

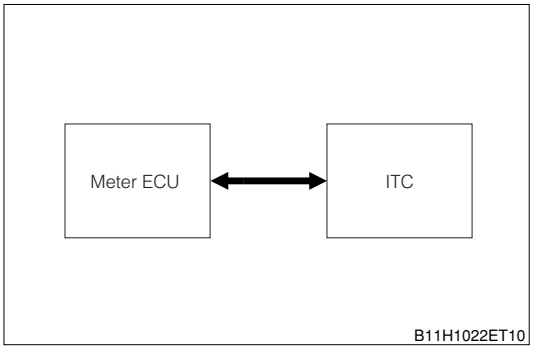
Refer to Page L2-1.



2-10 LIN COMMUNICATION

For the meter ECU in the meter, the LIN communication is employed for some of the communications with other ECU's.
Please refer to the pages of the LIN communication system for the LIN communication.

Refer to Page L2-13.



Contents of meter ECU communication (LIN communication)

Nomenclature of signals	Meter ECU		Applicable ECU
	Receiving	Sending	
ITC sleep refusal	○	–	ITC
Request of keyless door lock	–	○	ITC
Request of keyless door unlock	–	○	ITC
Key switch	–	○	ITC
Terminal ECU-T	–	○	ITC
Door courtesy switch	–	○	ITC

2-11 DIAGNOSIS (ONBOARD DIAGNOSIS FUNCTION)

This is a function whereby the ECU informs the inspection operator of the abnormal items when there has been a failure in the system. When failure takes place, the ECU memorizes the abnormal item.
Please refer to the repair manual for details concerning the diagnosis.

2-12 FAIL-SAFE FUNCTION

When an abnormality takes place in each function, the meter shifts to the fail mode and carries out the processes as in the following.

List of fail mode

Function	Abnormality item	Process when failure takes place
Speedometer	Vehicle speed signal (CAN) communication disabled	Indicates 0km/h
	Abnormality in the meter	Indicates 0km/h
Odometer	Vehicle speed signal (CAN) communication disabled	Does not integrate mileage
	Abnormality in the meter	· Does not integrate mileage · Indicates "ODO" on the LCD. · Blinks indication of integrated mileage figure ·The running distance is measured in the unit of km. Either of the above is done.
Trip meter	Vehicle mileage signal (CAN) communication disabled	Does not integrate mileage
	Abnormality in the meter	· Blinks indication of integrated mileage figure ·The running distance is measured in the unit of km. Either of the above is done.
Fuel gauge	Signal analog / digital conversion error	Turns off of all segments until the IG switch is turned "ON" again.
Shift position indicator	Multiple receiving of shift range information signal (CAN)	Turns off of the shift position indication and blinking of the frame indication only
	Shift range information signal (CAN) communication disabled	Turns off of the shift position indication and blinking of the frame indication only
High water temperature warning lamp/ Low water temperature indicator lamp	Engine water temperature signal (CAN) communication disabled	High water temperature warning lamp extinguished Low water temperature indicator lamp blinking
O/D OFF indicator	O/D OFF lamp request signal (CAN) communication disabled	Indicator extinguished
	A/T warning request signal (CAN) communication disabled	Indicator extinguished
Brake warning lamp	Brake warning lamp request signal (CAN) communication disabled	Lamp illuminated
ABS warning lamp	ABS warning lamp request signal (CAN) communication disabled	Lamp illuminated
Reverse warning buzzer	Multiple receiving of shift range information signal (CAN)	Buzzer sound stopped