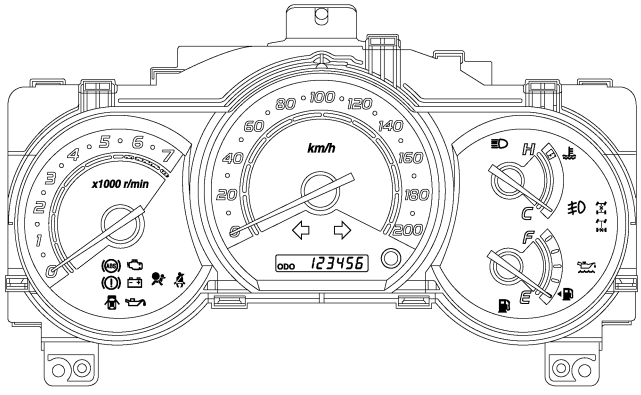
METER

■COMBINATION METER

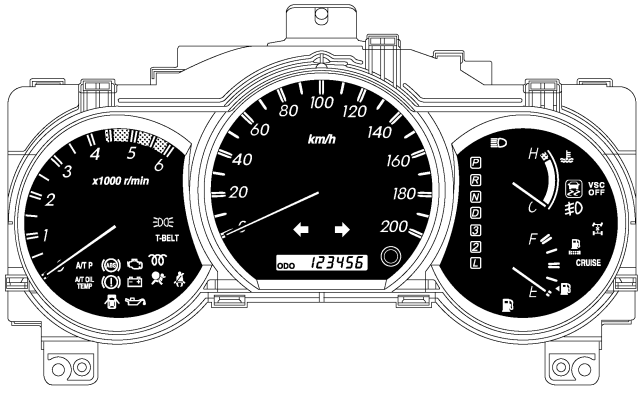
1. General

- An analog display type combination meter is provided as standard equipment on models for G.C.C Countries with 2TR-FE engine with manual transmission, models for South Africa with 2TR-FE engine, models with 5L-E engine and LHD models with 1KD-FTV engine without multi-information display, and deluxe grade of models for Central and South America.
  An Optitron display type combination meter is provided as standard equipment, except on models with the analog display type combination meter.
- The Optitron display type combination meter illuminates the indicator and dial, realizing excellent visibility through the use of smoke acrylic in the protective panel and LEDs (Light Emitting Diodes) that are very bright and have high contrast.
- A step motor is used for actuating the indicator of the speedometer, the tachometer, the fuel gauge, and the water temperature gauge.
- An odometer and a trip meter that use a LCD (Liquid Crystal Display) are used.
- The combination meter has a built-in meter ECU and buzzer.
- A fuel system warning light is provided in the combination meter on the models with the diesel engine.



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Analog Display Type
(Models for South Africa with 2TR-FE Engine)

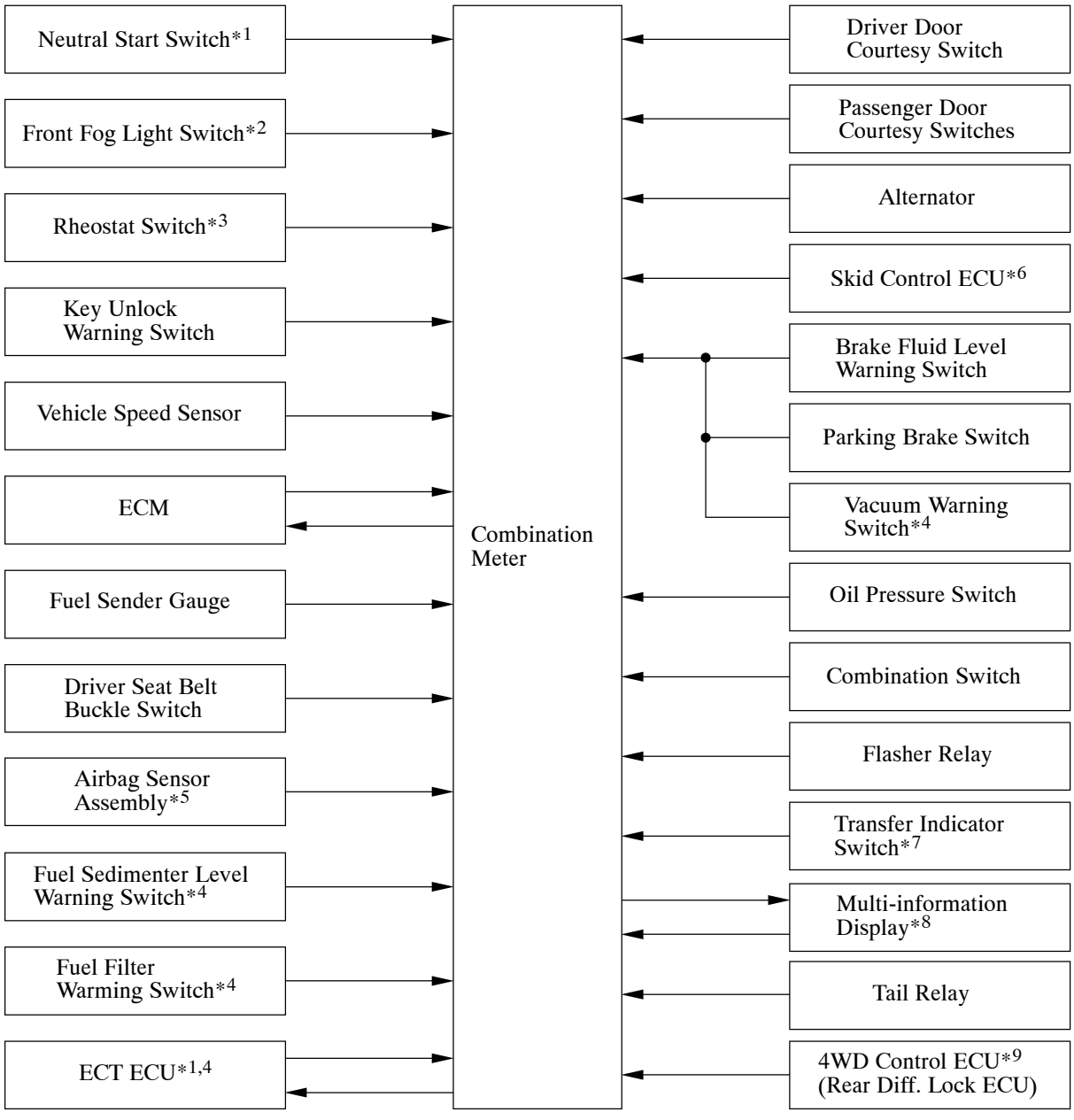


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Optitron Display Type
(Models for Thailand with 1KD-FTV Engine)

BE

2. System Diagram



00MBE69Y

*1: Models with automatic transmission
*2: Models with front fog light
*3: Models with Optitron display type combination meter
*4: Models with diesel engine
*5: Models with SRS airbag system
*6: Models with brake control system
*7: 4WD models
*8: Models with multi-information display
*9: Models with rear differential lock system

To Combination Meter

Sensor or ECU	Contents of Signal
Neutral Start Switch*1,3	Shift position signal
Front Fog Light Switch*2	Front fog light indicator light signal
Rheostat Switch*3	Rheostat control signal
Key Unlock Warning Switch	Ignition key presence signal (for key reminder system)
Vehicle Speed Sensor	Vehicle speed signal
Fuel Sender	Fuel Level Indication Signal
ECM	• Check engine warning light signal • Water temperature signal • Engine speed signal • Injection volume signal*7 • Grow indicator light signal*4 • CRUISE main indicator light signal*10 • A/T temperature warning light signal*1 *11
ECT ECU*1,4	A/T temperature warning light signal
Seat Belt Buckle Switch	Seatbelt warning light signal
Courtesy Switches	Door warning light signal
Fuel Sedimenter Level Warning Switch*4	Warning light blinking request signal
Fuel Filter Warning Switch*4	Warning light illumination request signal
Airbag Sensor Assembly*5	SRS airbag warning light signal
Alternator	Discharge light signal
Skid Control ECU*6	• ABS warning light signal • Slip indicator light signal • VSC OFF indicator light signal
Brake Fluid Level Warning Switch	Brake system warning light signal
Parking Brake Switch	Brake system warning light signal
Vacuum Warning Switch*4	Brake system warning light signal
Oil Pressure Switch	Oil pressure warning light signal
Tail Light Relay	Meter illumination signal
Flasher Relay	Turn signal indicator light signal
Combination Switch	Headlight high beam indicator light signal
Multi-information Display*7	Receives multi-information display operation information through serial data link
Transfer Indicator Switch*8	• Center diff lock indicator light signal • A/T P warning light signal
4WD Control ECU (Rear Diff. Lock ECU)*9	Rear diff. lock indicator light signal

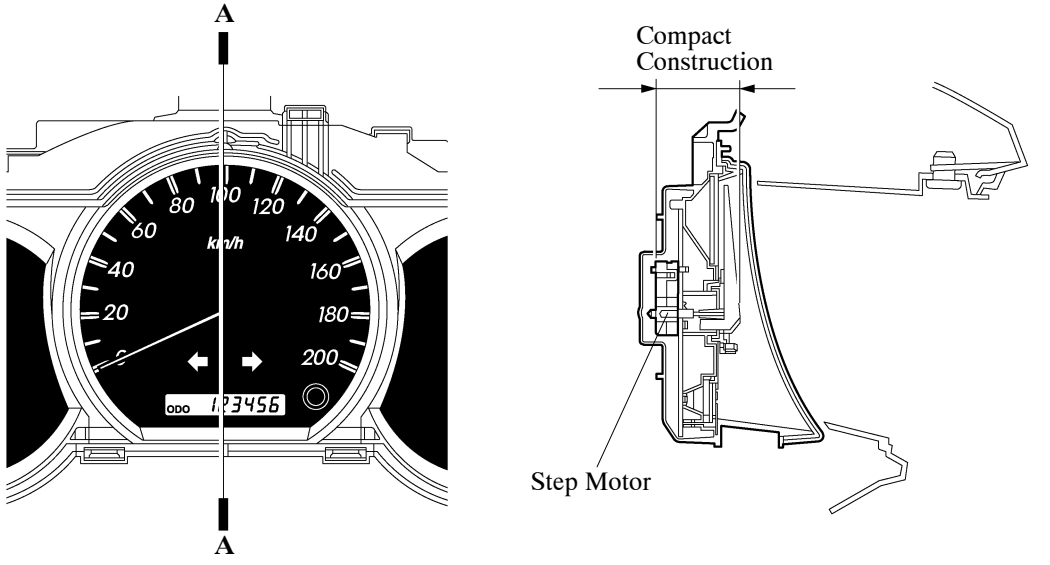
From Combination Meter

Sensor or ECU	Contents of Signal
ECM	Vehicle speed signal
ECT ECU*1,4	Vehicle speed signal
Multi-information Display*7	Transmits the following information through serial data link: • Transmits average vehicle speed information • Transmits average fuel consumption information • Transmits drivable distance information • Transmits instant fuel consumption information

*1: Model with automatic transmission
*2: Models with front fog light
*3: Models with Optitron display type combination meter
*4: Models with diesel engine
*5: Models with SRS airbag system
*6: Models with brake control system
*7: Models with multi-information display
*8: 4WD models
*9: Models with rear differential lock system
*10: Models with cruise control system
*11: Models with gasoline engine

3. Construction

- The step motor is used to actuate the indicator of the speedometer, the tachometer, the fuel gauge, and the water temperature gauge.
- This has resulted in a thinner indicator actuation movement, thus achieving a lightweight and compact construction.
- When the power to the combination meter is turned ON after the reconnection of the battery terminal, the step motor initializes once to recognize its zero point.



A-A Cross Section

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4. Fuel System Warning Light (Models with Diesel Engine)

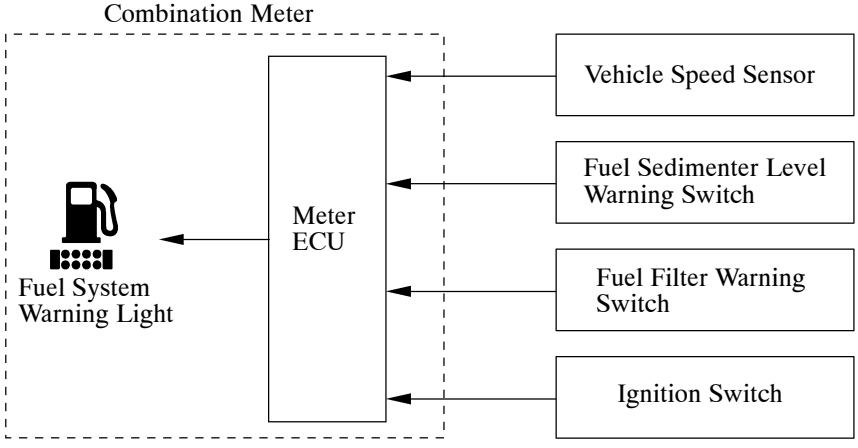
General

- In addition to the conventional fuel sedimenter warning functions, this light illuminates to inform the driver of a failure in case the clogging of the fuel filter is detected from the fuel filter warning switch.
- The illumination conditions of this light vary depending on the functions indicated below.

Function	Failure Activation
Fuel Filter Warning	Illumination
Fuel Sedimenter Warning	Blinking

- If a failure is detected simultaneously from the fuel sedimenter level warning switch and the fuel filter warning switch, the system gives precedence to the fuel sedimenter warning and causes the fuel system warning light to blink.
- This system is controlled by meter ECU.

▶ System Diagram ◀



271BE59

Operation

1) Fuel Sedimenter Warning

When the amount of water that has accumulated in the sedimenter reaches a predetermined level, the fuel sedimenter level warning switch, which is located in the bottom of the fuel filter, turns ON. The meter ECU renders this signal as a fuel sedimenter warning and causes the fuel system warning light to blink.

2) Fuel Filter Warning

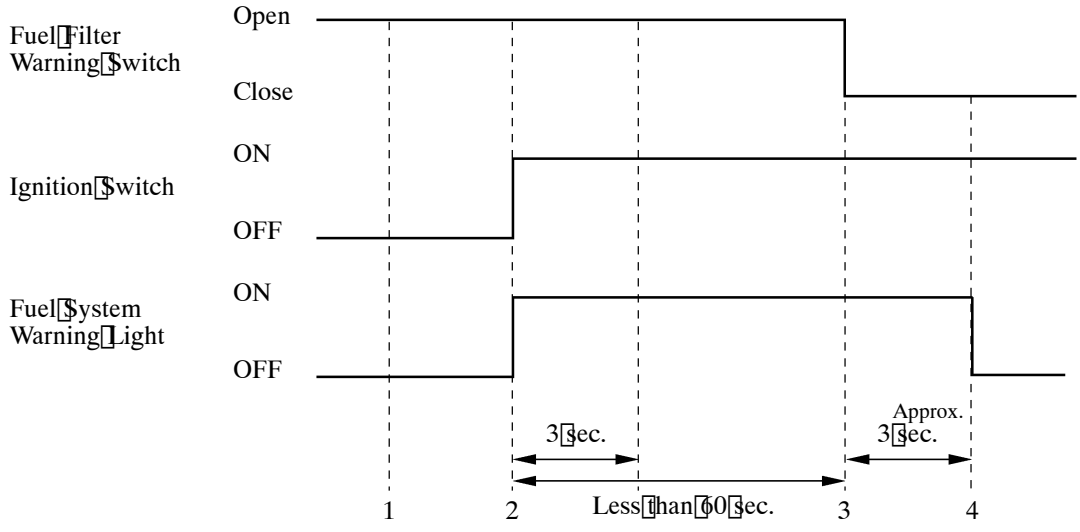
- The fuel filter warning switch is located in the upper area of the fuel filter.
- To prevent false alarms on a cold engine, the meter ECU starts its judgment function after a total of 30 minutes have elapsed with the input of vehicle speed signal information (minimum vehicle speed of 2.5 km/h).
- The fuel filter warning switch turns OFF when the vacuum in the fuel filter reaches a predetermined level.
- The meter ECU illuminates the fuel system warning light when the OFF signal from the fuel filter warning switch meets either of the following conditions:
  - OFF signals from the fuel filter warning switch are input continuously for 10 minutes.
  - When the ignition switch is in the ON position, OFF signal (between 1 second and 10 minutes in duration) from the fuel filter warning switch is input twice with a minimum interval of one second.

Service Tip

When the fuel filter warning switch detects a failure, the meter ECU stores this failure in memory, and continues to illuminate* the fuel system warning light. Therefore, after replacing the fuel filter, the illumination information stored in the meter ECU memory must be erased through the following procedure:

1. With the ignition switch turned OFF, disconnect the fuel filter warning switch connector.
2. Turn the ignition switch from OFF to ON.
3. After more than 3 seconds but less than 60 seconds have elapsed, reconnect the connector.
4. After approximately 3 seconds have elapsed with the fuel filter warning switch closed, the system confirms the deletion of the illumination information by turning OFF* the warning light.

*: The warning light will blink in case of a sedimenter failure.



5. Buzzer

General

The table below shows the warning and reminder functions of the buzzer.

Function	Item
Warning	• Seat Belt Warning System (See page BE-88) • Vehicle Speed Warning*
Reminder	• Light Reminder System (See page BE-4) • Key Reminder

*: Models for G.C.C. Countries.

Vehicle Speed Warning

This system blinks a warning light after sounding a buzzer for 6 seconds to warn the driver if the vehicle speed exceeds 120 km/h.

Key Reminder

When the driver's door is opened with the ignition key in the ACC or OFF position, the meter ECU sounds the buzzer to warn the driver that the ignition key has not been removed.