

ACCESSORIES & EQUIPMENT

Key Reminder Warning System (Diagnostics & Symptom Tests) - Sienna

KEY REMINDER WARNING SYSTEM

PRECAUTION

PRECAUTION

1. PRECAUTION FOR KEY REMINDER WARNING SYSTEM

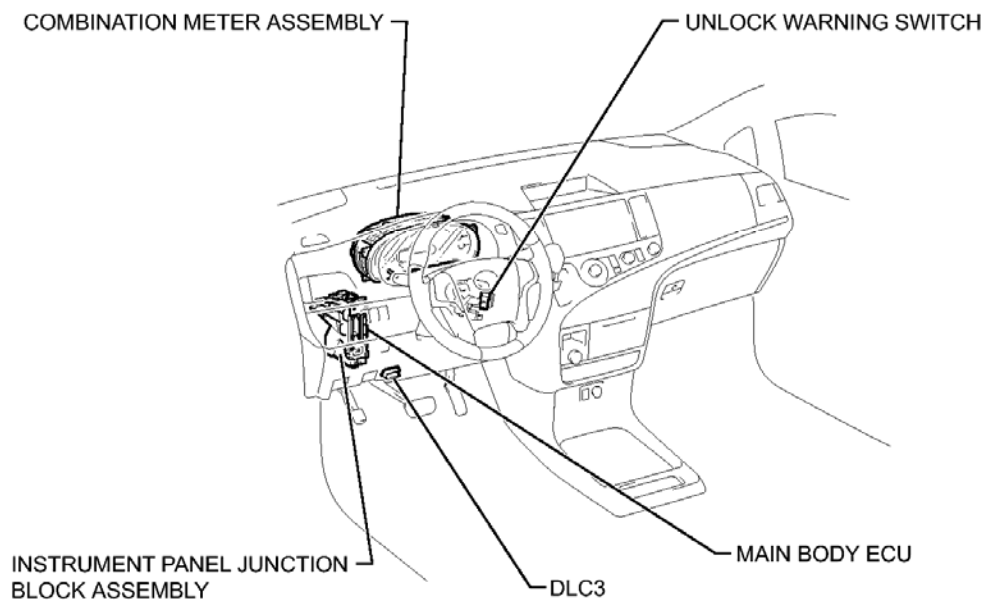
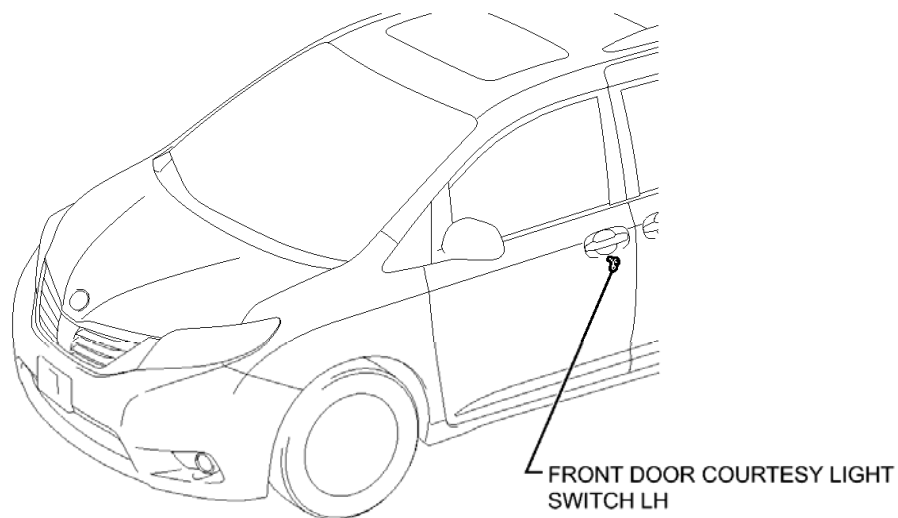
- a. For the inspection procedure of the key reminder warning system for models equipped with the smart key system, refer to the Smart Key System. Refer to **HOW TO PROCEED WITH TROUBLESHOOTING** .

2. PRECAUTIONS WHEN USING TECHSTREAM

- a. When using the Techstream to troubleshoot: Connect the Techstream to the vehicle while the ignition switch is off, and turn a courtesy light switch on and off at 1.5-second intervals until communication between the Techstream and the vehicle begins.
- b. After all DTCs are cleared, check if the trouble occurs again 6 seconds after the ignition switch is turned to ON.

PARTS LOCATION

ILLUSTRATION



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Fig. 1: Key Reminder Warning System Components Location
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

SYSTEM DIAGRAM

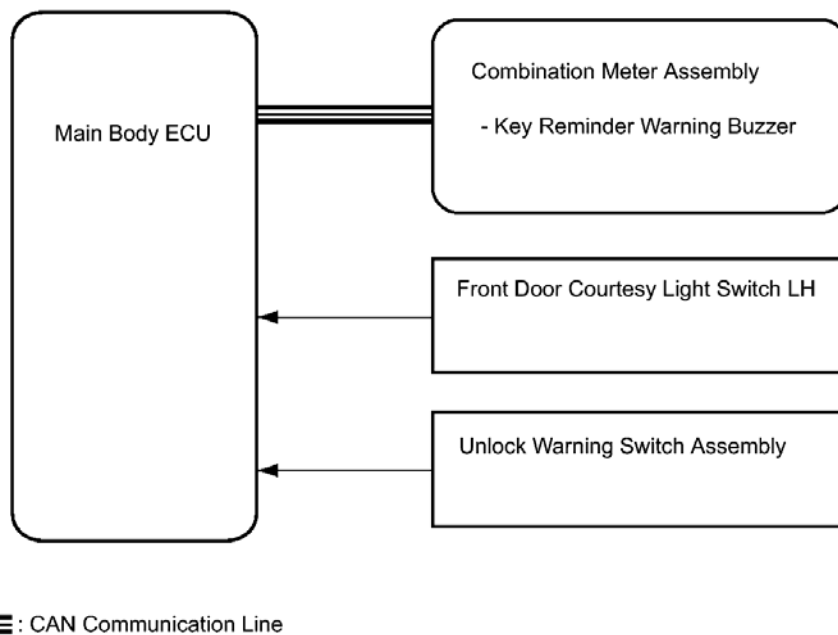


Fig. 2: Key Reminder Warning System Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COMMUNICATION TABLE

Sender	Receiver	Signal	Communication Method
Main Body ECU	Combination Meter Assembly	Front door courtesy light switch LH signal	CAN
Main Body ECU	Combination Meter Assembly	Unlock warning switch signal	CAN

SYSTEM DESCRIPTION

SYSTEM DESCRIPTION

1. KEY REMINDER WARNING SYSTEM DESCRIPTION

- a. When the driver side door is opened with the key in ACC or LOCK, this system causes a buzzer to sound in order to warn the driver that the key has not been removed.

HOW TO PROCEED WITH TROUBLESHOOTING

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure to troubleshoot the key reminder warning system.
- *: Use the Techstream.

1. VEHICLE BROUGHT TO WORKSHOP

NEXT: Go to next step

2. CUSTOMER PROBLEM ANALYSIS

HINT:

- In troubleshooting, confirm that the problem symptoms have been accurately identified. Preconceptions should be discarded in order to make an accurate judgment. To clearly understand what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time the malfunction occurred.
- Gather as much information as possible for reference. Past problems that seem unrelated may also help in some cases.
- The following 5 items are important points in the problem analysis:

What	Vehicle model, system name
When	Date, time, occurrence frequency
Where	Road conditions
Under what conditions?	Driving conditions, weather conditions
How did it happen?	Problem symptoms

NEXT: Go to next step

3. INSPECT BATTERY VOLTAGE

- Measure the battery voltage.

Standard voltage

11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding to the next step.

NEXT: Go to next step

4. INSPECT COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM*

- a. Using the Techstream, inspect the CAN communication function to ensure that there are no malfunctions in the communication system.

RESULT

Result	Proceed to
DTC is not output.	A
DTC is output.	B

B --> GO TO CAN COMMUNICATION SYSTEM. Refer to HOW TO PROCEED WITH TROUBLESHOOTING

A: Go to next step

5. PROBLEM SYMPTOMS TABLE

- a. Refer to PROBLEM SYMPTOMS TABLE.

RESULT

Result	Proceed to
Fault is not listed in Problem Symptoms Table.	A
Fault is listed in Problem Symptoms Table.	B

B --> Go to step 7

A: Go to next step

6. OVERALL ANALYSIS AND TROUBLESHOOTING*

- a. Data List / Active Test. Refer to DATA LIST / ACTIVE TEST

- b. Terminals of ECU. Refer to **TERMINALS OF ECU**
- c. Operation Check. Refer to **OPERATION CHECK**

NEXT: Go to next step

7. REPAIR OR REPLACE

NEXT: Go to next step

8. CONFIRMATION TEST

NEXT --> END

OPERATION CHECK

OPERATION CHECK

1. CHECK FUNCTION

- a. Check that the key reminder warning buzzer sounds.
 1. With the driver side door closed, insert the key into the ignition key cylinder and then make sure that the key is in LOCK or ACC.
 2. Check that the buzzer sounds intermittently if the driver side door is opened.
- b. Check that the key reminder warning buzzer stops.
 1. Check that the buzzer stops sounding if any of the following operations is performed while the buzzer is sounding:
 - Close the driver side door (driver side door courtesy light switch is off).
 - Turn the ignition switch to ON.
 - Pull out the key from the ignition key cylinder.

PROBLEM SYMPTOMS TABLE

PROBLEM SYMPTOMS TABLE

HINT:

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

KEY REMINDER WARNING SYSTEM

Symptom	Suspected Area	See
Key Reminder Buzzer does not	Proceed to Key Reminder Buzzer	Refer to <u>Key Reminder Buzzer</u>

Sound

does not Sound

does not Sound

TERMINALS OF ECU

TERMINALS OF ECU

1. CHECK INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY AND MAIN BODY ECU

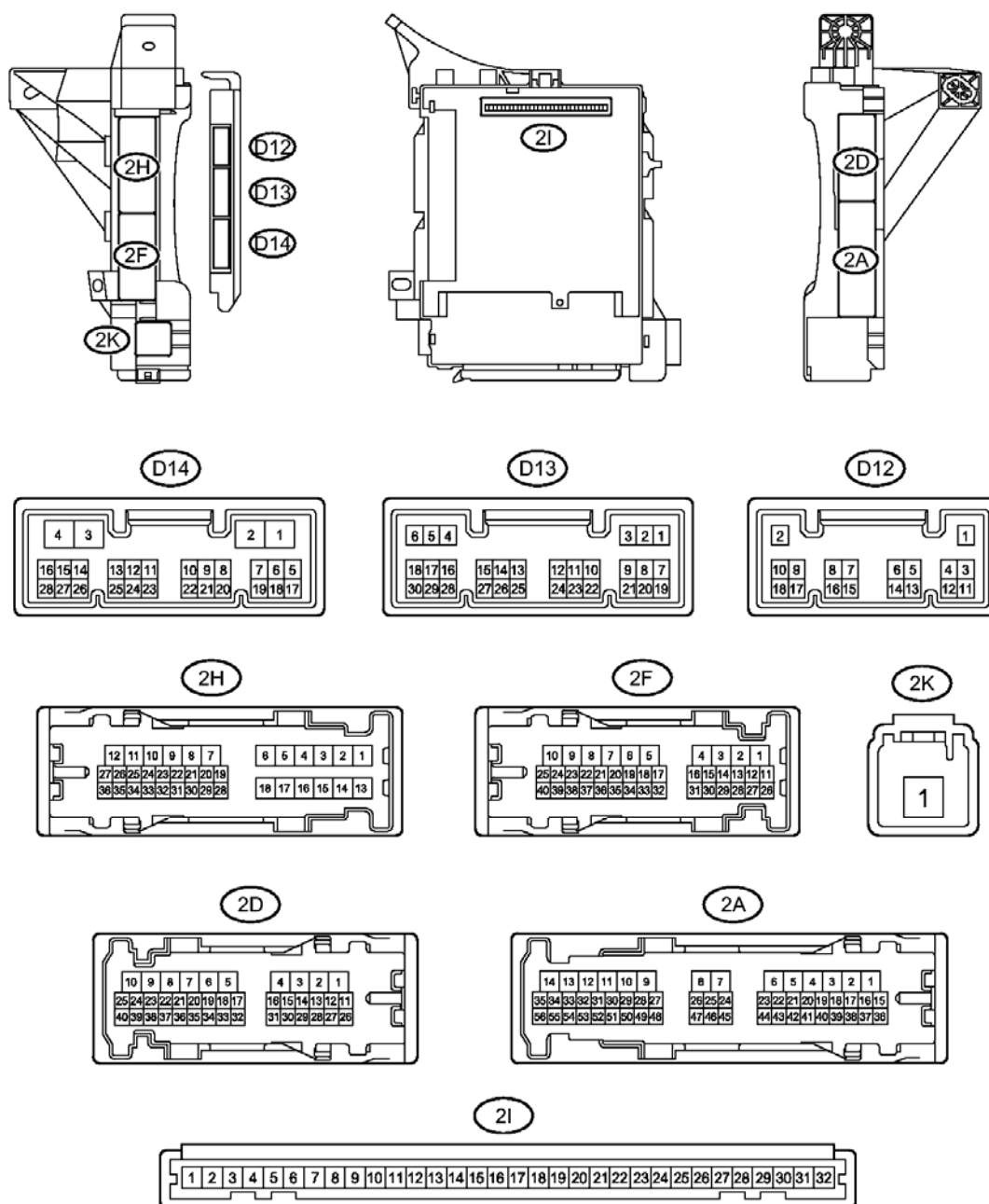


Fig. 3: ECU Connector Terminal Identification - I/P Junction Block & Main Body ECU
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- a. Remove the main body ECU.
- b. Disconnect the D13 and D14 main body ECU connectors.
- c. Measure the resistance and voltage between each terminal of the wire harness connectors and body ground.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
2I-2 (FLCY) - Body ground	-	Front door courtesy light switch LH input	Driver door Closed (off) --> Open (on)	10 kohms or higher - --> Below 1 ohms
2I-11 (GND1) - Body ground	-	Ground	Always	Below 1 ohms
2I-29 (ACC) - Body ground	-	Ignition power supply (ACC signal)	Ignition switch ACC --> off	11 to 14 V --> Below 1 V
2I-30 (BECU) - Body ground	-	+B (power system signal system) power supply	Always	11 to 14 V
2I-31 (ALTB) - Body ground	-	+B (power system alternator system) power supply	Always	11 to 14 V
2I-32(IG) - Body ground	-	Ignition power supply (IG signal)	Ignition switch ON --> off	11 to 14 V --> Below 1 V
D13-17 (KSW) - Body	R - Body ground	Unlock warning switch input	No key in ignition key cylinder (off) -->	10 kohms or higher - --> Below

ground			Key inserted (on)	1 ohms
D14-3 (GND2)	W-B - Body ground	Ground	Always	Below 1 ohms

HINT:

If the result is not as specified, there may be a malfunction on the wire harness side.

- d. Reinstall the main body ECU.
- e. Reconnect the D13 and D14 main body ECU connectors.
- f. Measure the voltage between each terminal of the wire harness side connectors and body ground.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
D13-17 (KSW) - Body ground	R - Body ground	Unlock warning switch input	No key in ignition key cylinder (off) --> Key inserted (on)	11 to 14 V --> Below 1 V
2H-35 (FLCY) - Body ground	P - Body ground	Front door courtesy light switch LH input	Driver door Closed (off) --> Open (on)	11 to 14 V (Pulse generation) --> Below 1 V

If the result is not as specified, the main body ECU may have a malfunction.

DIAGNOSIS SYSTEM

DIAGNOSIS SYSTEM

1. DESCRIPTION

- a. Data of the system can be read from the Data Link Connector 3 (DLC3) of the vehicle. Therefore, when the system seems to be malfunctioning, use the Techstream to check for a malfunction and repair it.

2. CHECK DLC3

- a. Check the DLC3. Refer to **GENERAL INFORMATION** .

3. INSPECT BATTERY VOLTAGE

- a. Measure the battery voltage.

Standard voltage

11 to 14 V

If the voltage is below 11 V, recharge or replace the battery.

DATA LIST / ACTIVE TEST

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTE: In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Enter the following menus: Body Electrical / Main Body / Data List.
- e. Read the Data List according to the display on the Techstream.

MAIN BODY

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Key Unlock Warning SW	Unlock warning switch signal / ON or OFF	ON: Key in ignition key cylinder OFF: No key in ignition key cylinder	-
		ON:	

ACC SW	Ignition switch ACC signal / ON or OFF	Ignition switch ACC or ON OFF: Ignition switch off or START	-
IG SW	Ignition switch ON signal / ON or OFF	ON: Ignition switch ON or START OFF: Ignition switch off or ACC	-
FL Door Courtesy	Driver door courtesy switch signal / ON or OFF	ON: Driver door closed OFF: Driver door open	-

SYMPTOM TESTS

Key Reminder Buzzer does not Sound

DESCRIPTION

The key reminder warning buzzer sounds when the driver side door is opened while the ignition switch is in the LOCK or ACC positions. The key reminder warning buzzer is activated when the main body ECU sends a key switch signal and driver side courtesy light switch signal to the combination meter.

WIRING DIAGRAM

- e. Read the Data List according to the display on the Techstream.

MAIN BODY

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Key Unlock warning SW	Unlock warning switch signal / ON or OFF	ON: Key is in ignition key cylinder OFF: No key is in ignition key cylinder	-

OK

When the unlock warning switch is operated, the display changes as shown in the table.

NG --> See step 4

OK: Go to next step

3. CHECK COMBINATION METER ASSEMBLY (BUZZER OPERATION)

- a. Remove the key from the key cylinder, turn the light control switch on the headlight dimmer switch assembly to the tail position, and open the driver door.

OK

The light reminder warning buzzer sounds.

HINT:

The key reminder warning system sounds the buzzer built in to the combination meter for key reminder warnings. This buzzer is also used for the light reminder warning system. Therefore, check the operation of the combination meter buzzer by checking if the buzzer sounds to inform that the lights are still on.

NG --> See step 9

OK --> See step 10

4. INSPECT UNLOCK WARNING SWITCH ASSEMBLY

- a. Remove the unlock warning switch assembly. Refer to **REMOVAL** .

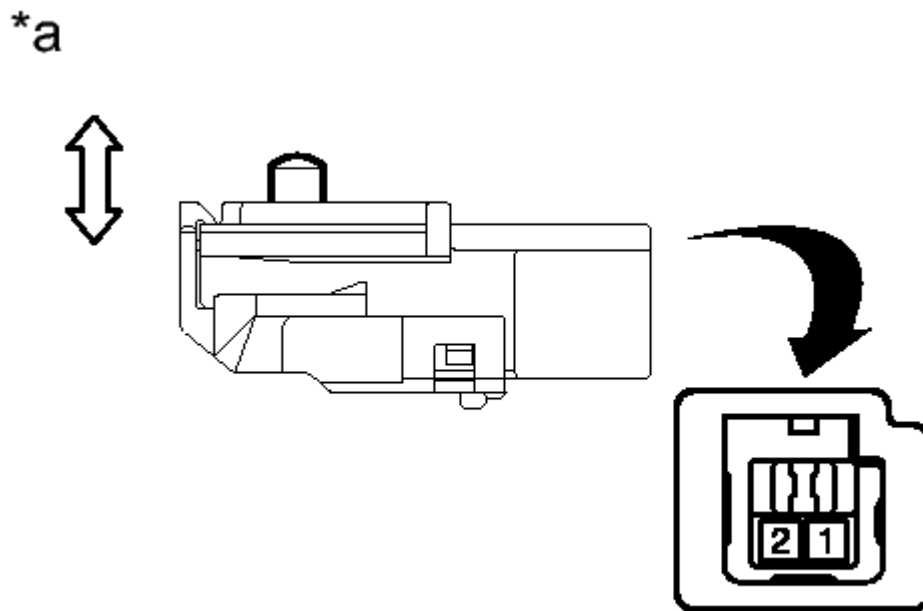


Fig. 5: Inspecting Unlock Warning Switch Assembly With Connector End View
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
1 - 2	Switch free	10 kohms or higher
1 - 2	Switch pushed	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Component without harness connected (Unlock Warning Switch)
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NG --> See step 11

OK: Go to next step

5. CHECK HARNESS AND CONNECTOR (UNLOCK WARNING SWITCH - MAIN BODY ECU)

- a. Disconnect the D26 unlock warning switch connector.
- b. Disconnect the D13 main body ECU connector.
- c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D26-1 - D13-17 (KSW)	Always	Below 1 ohms
D26-1 - Body ground	Always	10 kohms or higher
D26-2 - Body ground	Always	Below 1 ohms

NG --> REPLACE HARNESS OR CONNECTOR

OK: Go to next step

6. REPLACE MAIN BODY ECU

- a. Temporarily replace the main body ECU with a new or normally functioning one. Refer to **REMOVAL**.

NEXT: Go to next step

7. READ VALUE USING TECHSTREAM (KEY UNLOCK WARNING SW)

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Enter the following menus: Body Electrical / Main Body / Data List/
- e. Read the Data List according to the display on the Techstream.

MAIN BODY

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Key Unlock	Unlock warning	ON: Key is in ignition key cylinder	

warning SW	switch signal / ON or OFF	OFF: No key is in ignition key cylinder	-
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OK

When the unlock warning switch is operated, the display changes as shown in the table.

NG --> REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

OK --> END (MAIN BODY ECU IS DEFECTIVE)

8. **GO TO DOOR COURTESY LIGHT SWITCH CIRCUIT. Refer to Door Courtesy Switch Circuit**
9. **REPLACE COMBINATION METER ASSEMBLY. Refer to REMOVAL**
10. **REPLACE MAIN BODY ECU. Refer to REMOVAL**
11. **REPLACE UNLOCK WARNING SWITCH ASSEMBLY. Refer to REMOVAL**