

## ACCESSORIES & EQUIPMENT

### Lighting System (Diagnostics - Introduction) - Sienna

## LIGHTING SYSTEM

### PRECAUTION

### PRECAUTION

#### 1. EXPRESSION OF IGNITION SWITCH

- a. The type of ignition switch used on this model differs according to the specifications of the vehicle.

The expressions listed in the table below are used in this information.

| Expression          | Ignition Switch<br>(Position) | Engine Switch<br>(Condition) |
|---------------------|-------------------------------|------------------------------|
| Ignition switch off | LOCK                          | Off                          |
| Ignition switch ON  | ON                            | On (IG)                      |
| Ignition switch ACC | ACC                           | On (ACC)                     |
| Engine Start        | START                         | Start                        |

#### 2. PRECAUTION FOR HID HEADLIGHT SYSTEM

- a. When the High Intensity Discharge (HID) headlight is illuminated or has recently been turned off, the light control ECU can be extremely hot, so be careful not to burn yourself.
- b. When any of the following defects are identified on the HID headlight, replace it with new one.
- Deformation, cracks, dents, chipping, etc. on the light control ECU.
  - Deformation, cracks or chipping on the connector or high voltage socket.
  - Loose connection of reflector side ground circuit because of deformation of the socket cover.
  - Damaged wire harness for output.
- c. If the HID headlight illuminates normally but then flickers or shuts off, perform the inspection of HID headlight bulb. Refer to **ON-VEHICLE INSPECTION - Step 1**.
- d. Even if the operation of the lights seems to be normal temporarily, the fail-safe function operates and illumination will be interrupted.
- e. Since an HID headlight bulb has pressurized gas inside and can easily be broken if scratched or dropped, special care should be taken. When handling the bulb, hold the plastic or metal part and do not touch the glass part with bare hands.
- f. When the HID headlights illuminate, a high voltage (approximately 30000 V) is applied

momentarily to the bulb sockets. Never touch the bulb or socket with bare hand, and never connect a tester to the high voltage socket of an HID headlight for measurement, as this may result in a serious accident because of high voltage.

- g. When servicing an HID headlight, first confirm that the temperature of the light control ECU is adequately low and do not allow the HID headlight to come into contact with water. Turn off the light control switch and disconnect the cable from the negative (-) battery terminal and the connector of the light control ECU in advance to avoid electric shocks.
- h. When performing an operation related to an HID headlight, only operate it after assembly is complete. Never turn on the HID headlights without a bulb installed.
- i. Do not turn on the HID headlights using a power source other than the vehicle battery.
- j. The illumination color of the discharge bulb changes with time elapsed.

### **3. PRECAUTION FOR HEADLIGHT BULB REPLACEMENT**

- a. If even a thin film of oil is left on the surface of an HID headlight bulb or a halogen bulb, its service life will be shortened because the light will burn at a higher temperature. When replacing a bulb, be sure to hold the flanged part of the light so that your hand does not contact the glass part of the bulb.
- b. Due to the high internal pressure of HID headlight bulbs, they may explode and shatter if dropped, hit or damaged.
- c. Always prepare a new bulb for immediate replacement. While replacing the bulb, the lens may attract dust and moisture if removed from the vehicle for a long time.
- d. Always replace a bulb with another bulb of the same wattage.
- e. If only replacing the bulb on one side, differences in brightness and lighting color between the right and left sides may occur.
- f. Securely install the socket after bulb replacement. The lens may become cloudy or the light cavity may be filled with water through gaps around the socket if it is not installed securely.
- g. Do not break the HID headlight bulb when disposing of it as shards of glass may fly off and cause injuries.

### **4. PRECAUTION FOR AUTOMATIC HIGH BEAM SYSTEM**

- a. General Description

The automatic high beam system is a system that helps ensure visibility by automatically turn the high beams on and off. In addition, due to control limitations of the automatic high beam system, it may be necessary to manually turn high beams on and off. For safety reasons, make sure to switch the high beams and low beams manually according to the driving conditions.

- b. Conditions Unsuitable for Using Automatic High Beam System

Under the following conditions, the automatic high beam system might not detect other vehicles or lights correctly, or the high beams might cause glare or flash pedestrians or the occupants of other vehicles. Manual operation should be considered.

| Factor | Condition                          |
|--------|------------------------------------|
|        | When driving in bad weather (rain, |

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Weather/Climate  | snow, fog, sandstorms, etc.).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Front windshield | <ul style="list-style-type: none"> <li>• When the front windshield is not clear (ice, snow or frost on the glass).</li> <li>• When the front windshield is dirty (sand, mud, water stain or bugs on the glass).</li> <li>• When the front windshield is cracked.</li> <li>• When the front windshield is fogged-up.</li> <li>• When the front windshield has a film attached.</li> <li>• When an object on the instrument panel reflects off of the front glass.</li> <li>• When any other abnormal</li> </ul> |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | conditions exist with the front glass.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Inner rear view mirror assembly | <ul style="list-style-type: none"> <li>• When a parking tag, magnifying lens or other accessory is mounted on the inner rear view mirror assembly.</li> <li>• When the inner rear view mirror assembly or its built-in camera is deformed.</li> <li>• When the camera sensor in the inner rear view mirror assembly is dirty.</li> <li>• When any other abnormal conditions exist with the inner rear view mirror assembly or its built-in camera sensor.</li> </ul> |
|                                 | <ul style="list-style-type: none"> <li>• When lights similar to headlights or taillights are</li> </ul>                                                                                                                                                                                                                                                                                                                                                              |

|                           |                                                                                                                                                                                                                                                                                                                                    |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nearby vehicles or lights | <p>in the vicinity of the vehicle.</p> <ul style="list-style-type: none"> <li>• When a nearby vehicle has no lights or its lights are off.</li> <li>• When a vehicle in front has misaligned lights, or its lights are changing color.</li> <li>• When a vehicle in front has extremely dirty headlights or taillights.</li> </ul> |
| Road conditions           | <ul style="list-style-type: none"> <li>• When driving in areas where the conditions often change between bright and dark.</li> <li>• When driving on hilly roads.</li> <li>• When driving on winding roads or around sharp curves.</li> </ul>                                                                                      |

|             |                                                                                                                                                                                                                                                                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | <ul style="list-style-type: none"> <li>• When driving on bumpy roads (cobblestone paving, gravel road, rough unpaved road, etc.).</li> <li>• When highly reflective objects are in front of the vehicle (mirrors, road signs, etc.).</li> </ul>                                                                                               |
| Own vehicle | <ul style="list-style-type: none"> <li>• When the headlights are damaged, deformed or dirty.</li> <li>• When the vehicle posture is abnormal (posture has changed due to the vehicle being fully loaded, a trailer being towed, road conditions etc.).</li> <li>• When the vehicle has other malfunctions or it has been modified.</li> </ul> |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Automatic high beam system | <p>Malfunction<br/>When the indicator on the combination meter assembly is off or is blinking.<br/>Others</p> <ul style="list-style-type: none"> <li>• When the auto high beam system does not seem to be turning the high beams on and off property.</li> <li>• When the auto high beam system is frequently turning the high beams on and off.</li> <li>• When the glare from the high beams would disturb pedestrians or the drivers of other vehicles.</li> </ul> |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

c. Windshield Replacement Precautions

The timing of the change between high beams and low beams differs depending on the light transmission rate of the glass. For this reason, when replacing the windshield, replace it with an original equipment part.

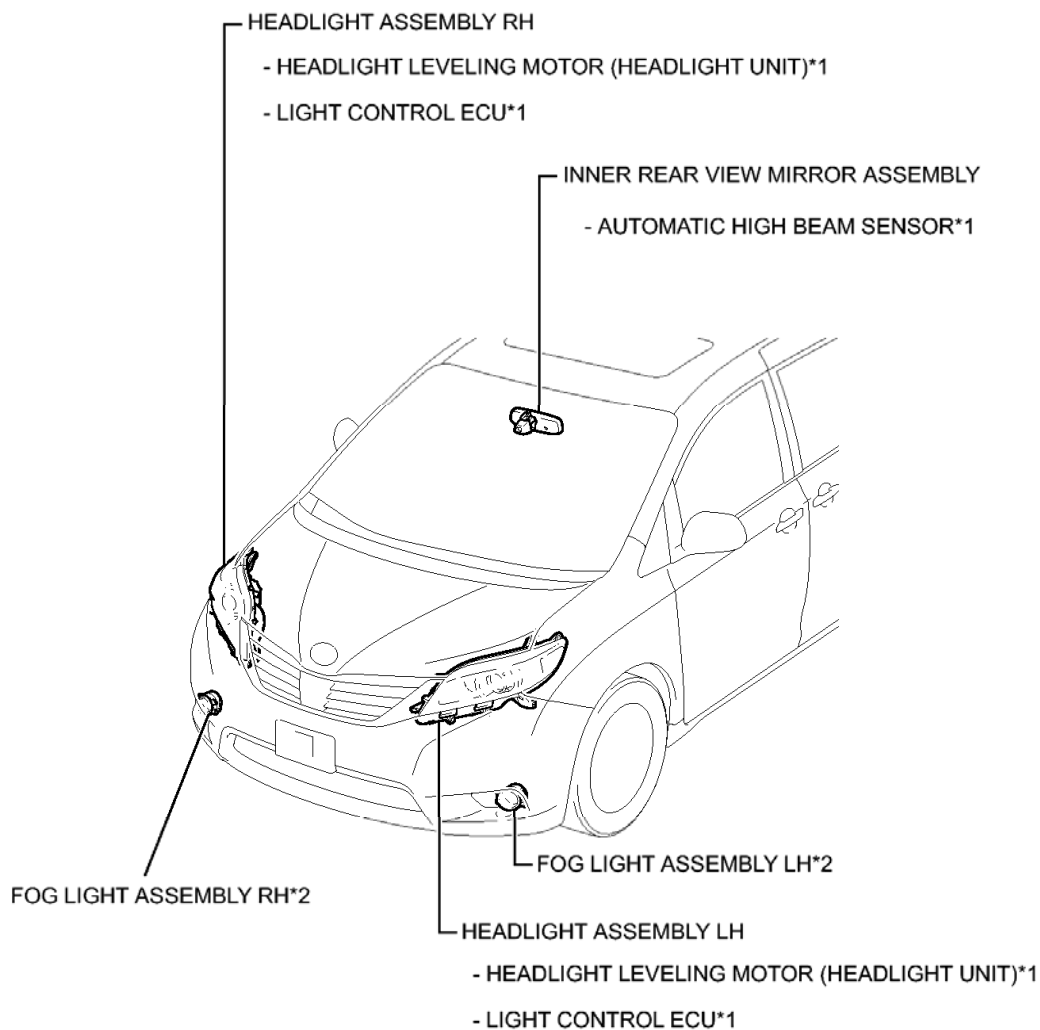
d. Inner Rear View Mirror Assembly Handling Precautions

Failure to observe the following precautions may result in a malfunction:

- Do not touch the lens of the camera (built into the inner rear view mirror assembly) with bare hands.
- Do not allow anything to adhere to the camera lens (built into the inner rear view mirror assembly).
- Do not apply strong impacts to the inner rear view mirror assembly.
- Do not allow any liquids to contact the inner rear view mirror assembly.

## PARTS LOCATION

### ILLUSTRATION



\*1: w/ HID Headlight System

\*2: w/ Fog Light

P

**Fig. 1: Exterior Lighting System Components Location (1 Of 5)**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## ILLUSTRATION

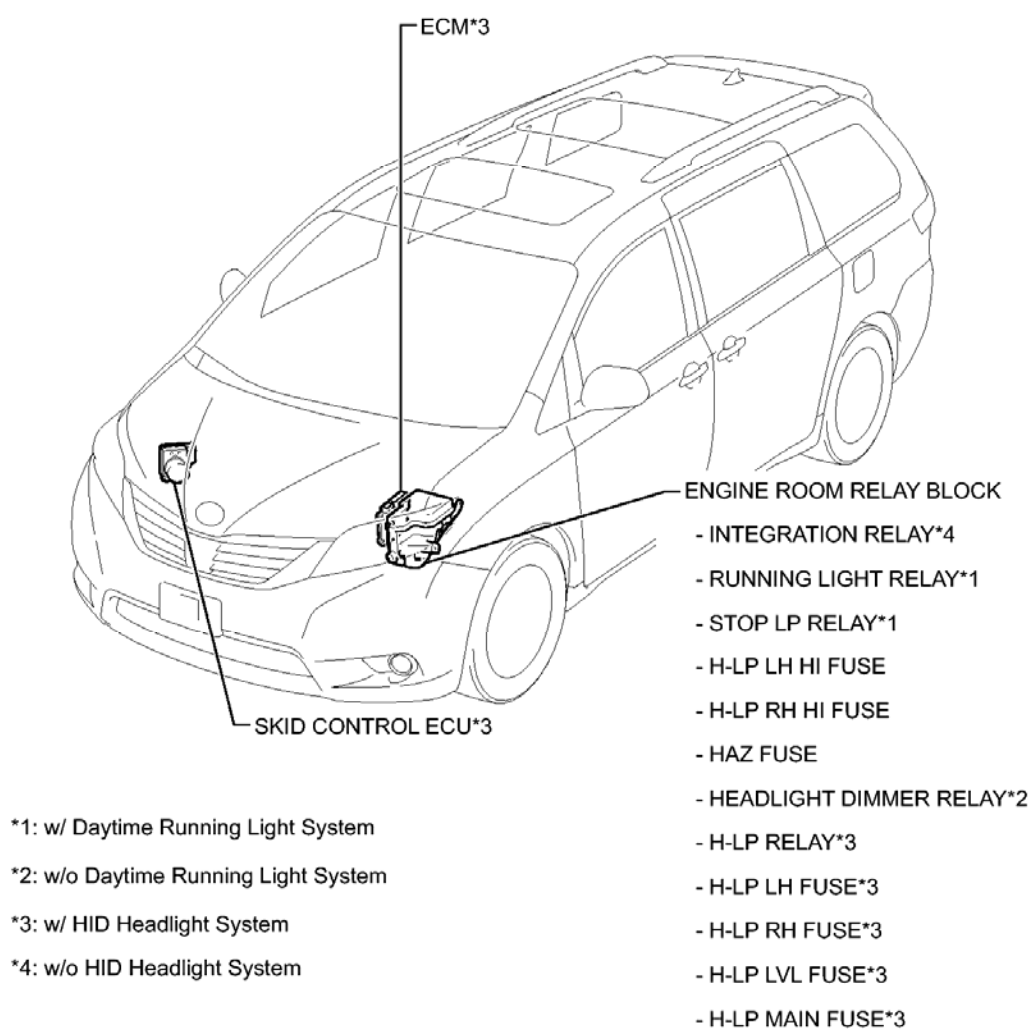
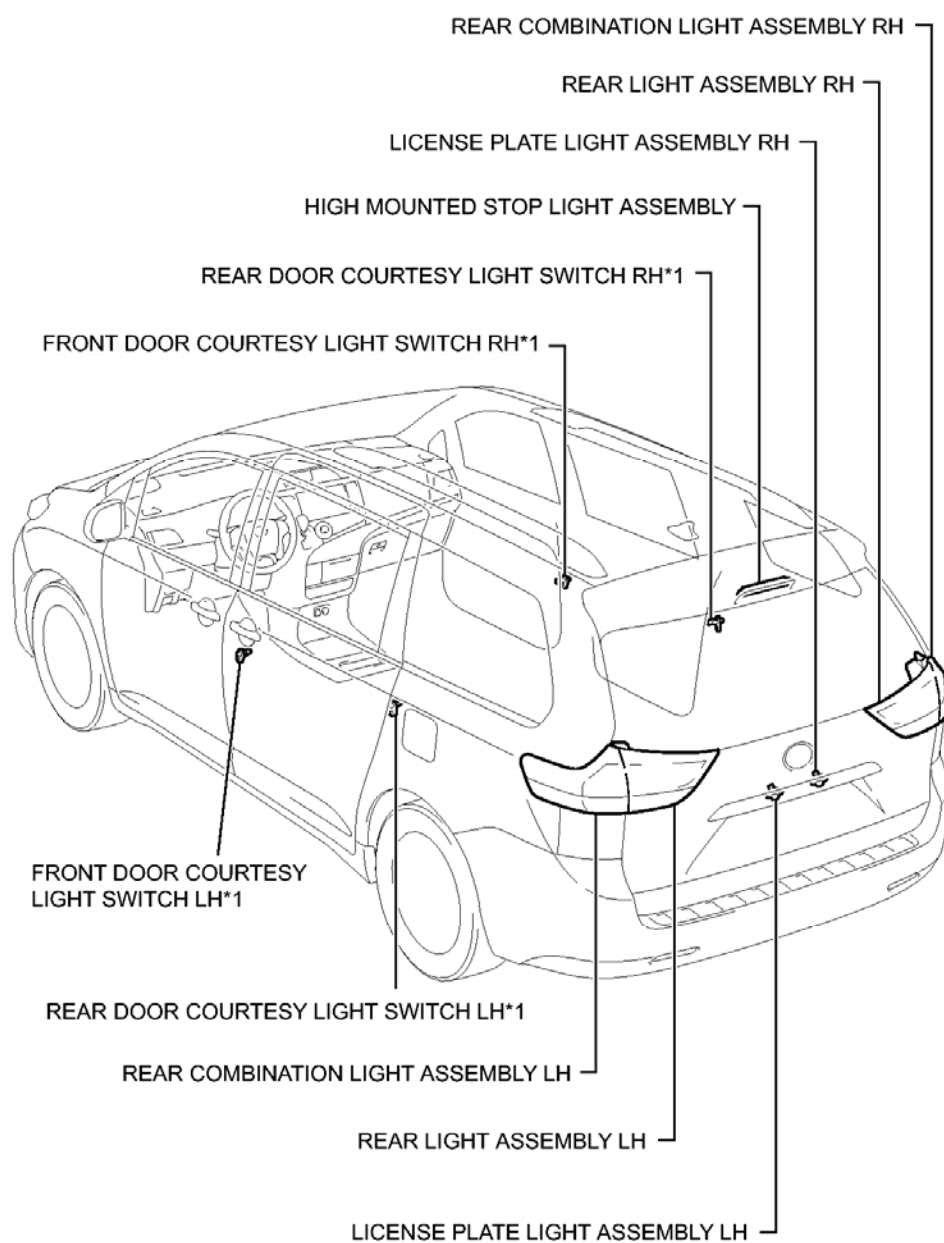


**Fig. 2: Exterior Lighting System Components Location (2 Of 5)**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## ILLUSTRATION



\*1: w/ HID Headlight System

P

**Fig. 3: Exterior Lighting System Components Location (3 Of 5)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

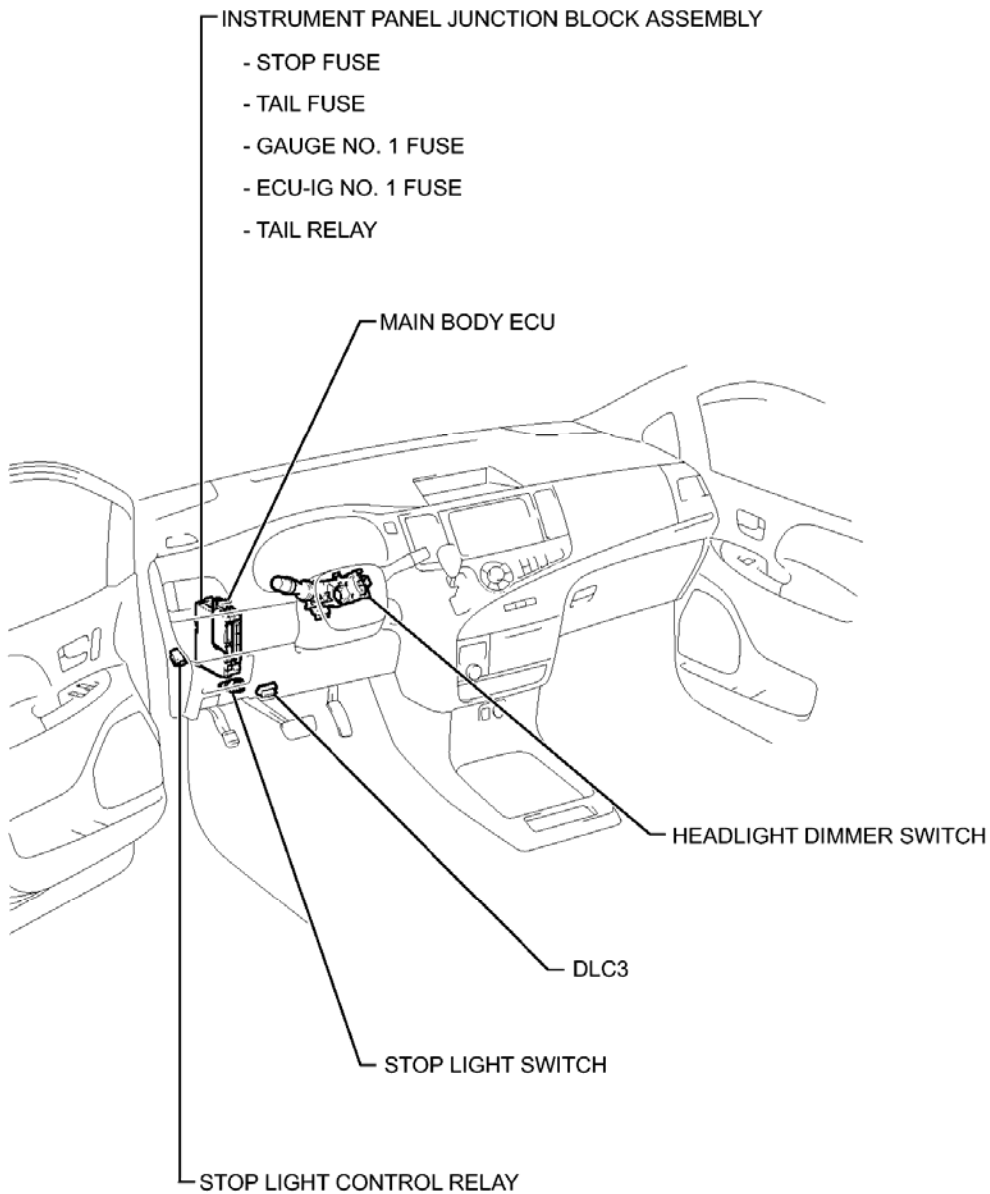
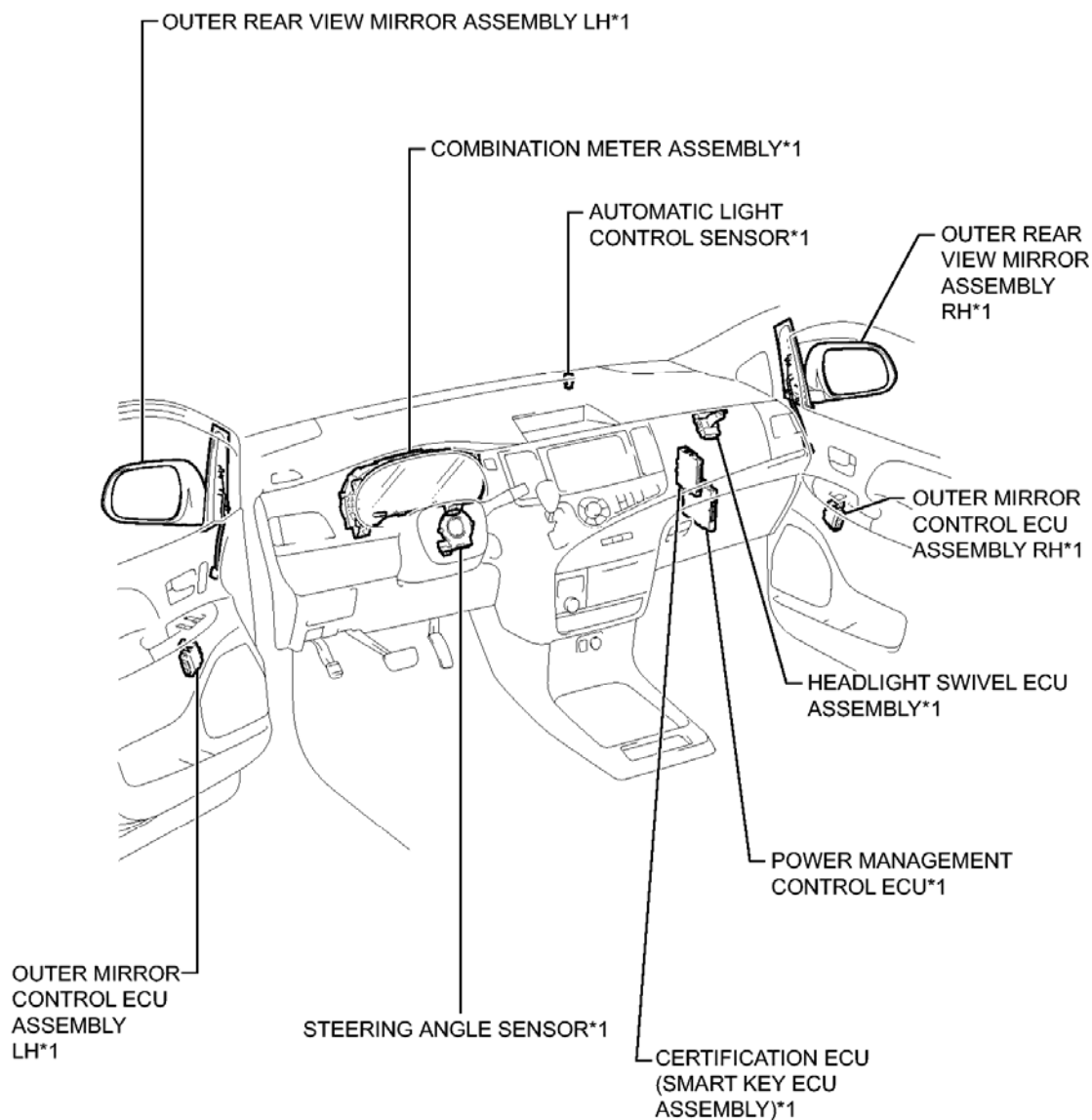


**Fig. 4: Exterior Lighting System Components Location (4 Of 5)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



\*1: w/ HID Headlight System

**Fig. 5: Exterior Lighting System Components Location (5 Of 5)**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## SYSTEM DIAGRAM

## SYSTEM DIAGRAM

### 1. AUTOMATIC LIGHT CONTROL SYSTEM

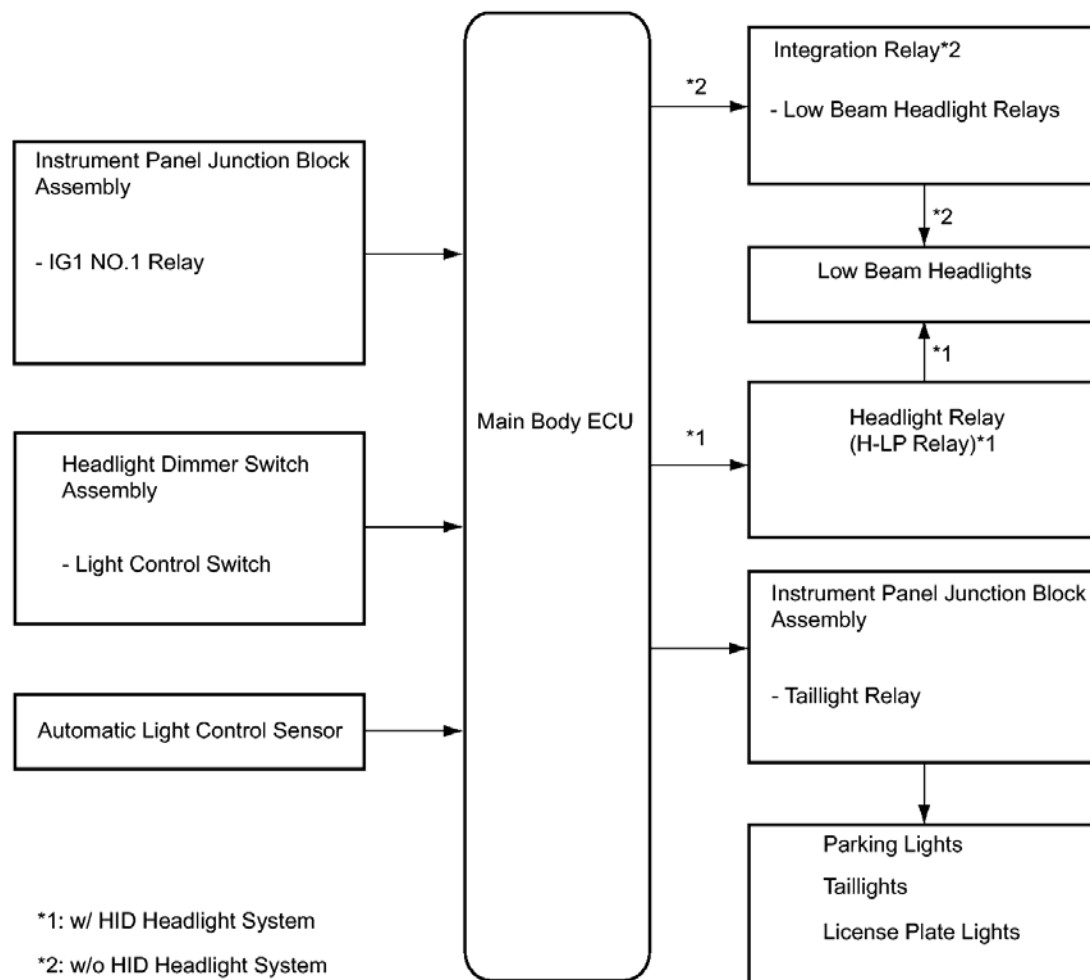


**Fig. 6: Automatic Light Control System Diagram**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## 2. LIGHT AUTO TURN-OFF SYSTEM

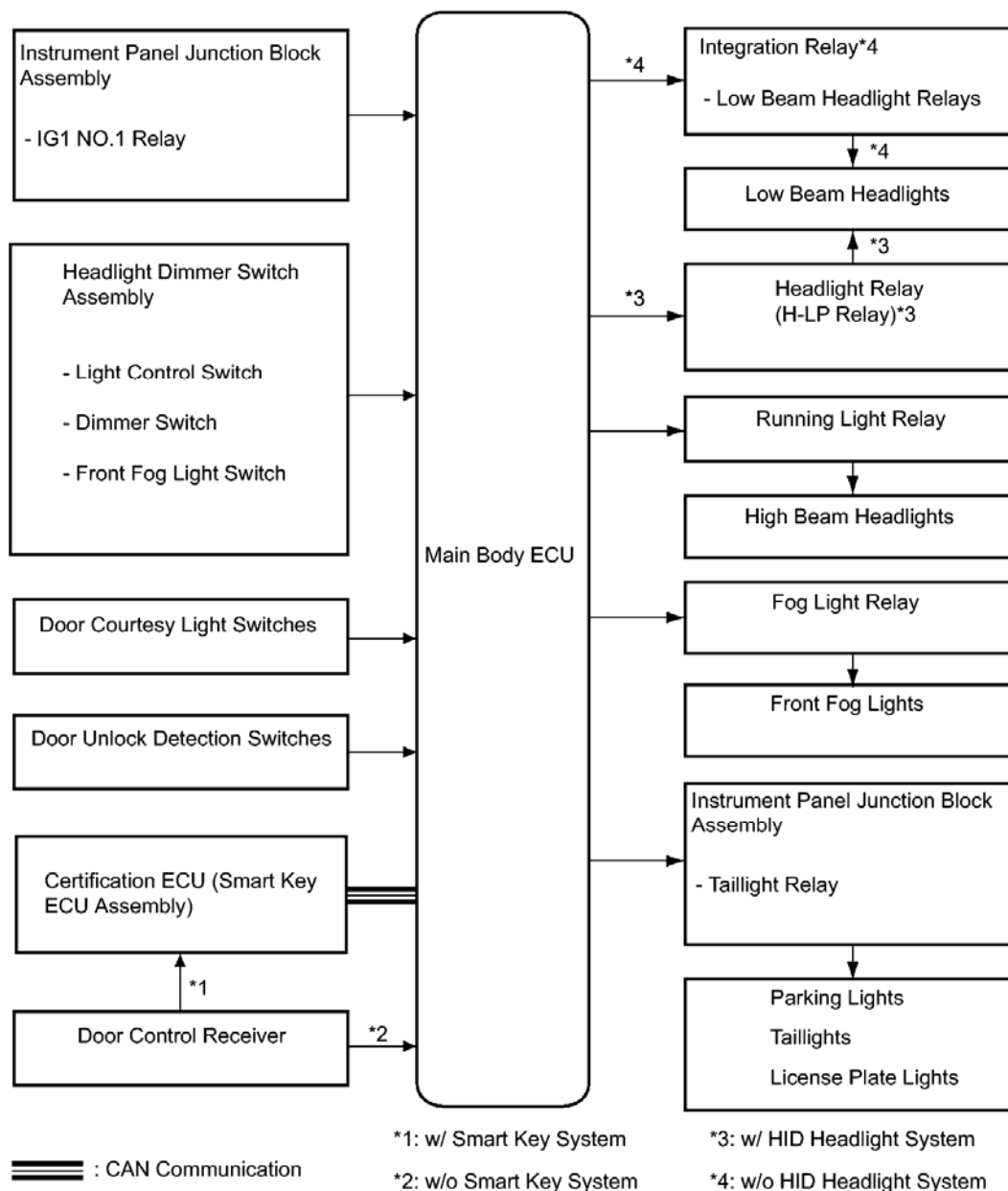


**Fig. 7: Light Auto Turn-Off System Diagram**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**COMMUNICATION TABLE**

| Transmitter              | Receiver  | Line | Data Name     |
|--------------------------|-----------|------|---------------|
| Certification ECU (Smart | Main Body | CAN  | Wireless Door |

|                      |     |  |                |
|----------------------|-----|--|----------------|
| Key ECU<br>Assembly) | ECU |  | Lock<br>Signal |
|----------------------|-----|--|----------------|

3. DAYTIME RUNNING LIGHT SYSTEM

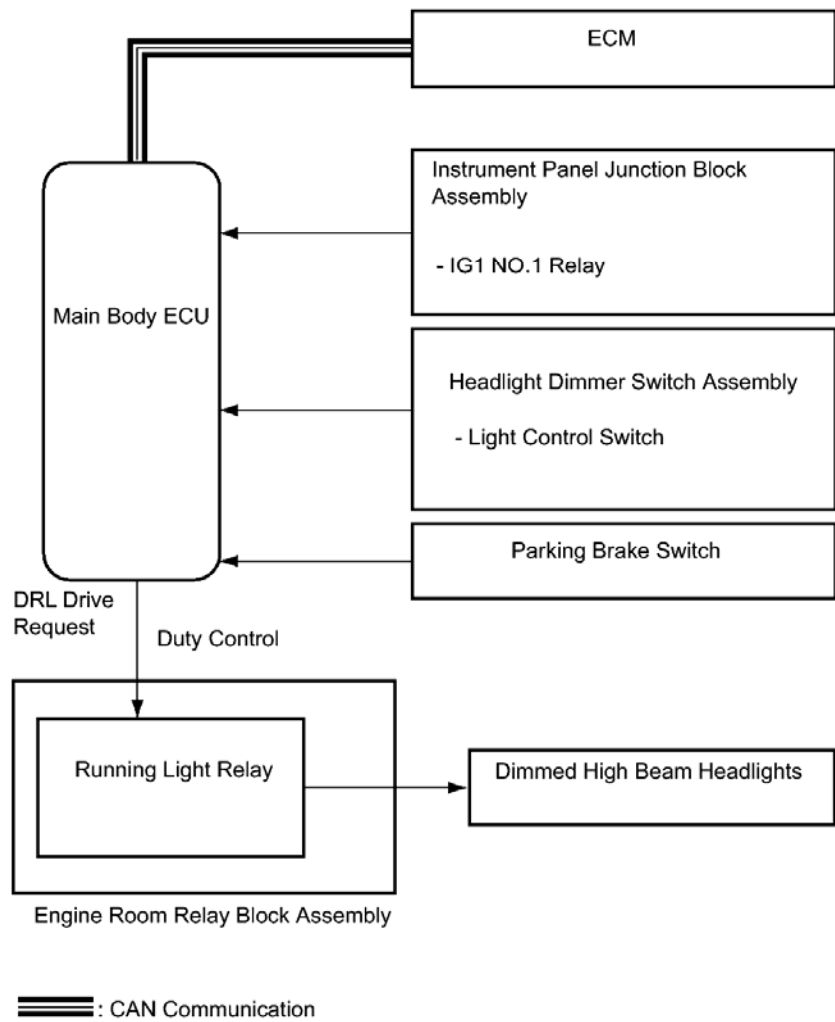


**Fig. 8: Daytime Running Light System Diagram**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COMMUNICATION TABLE

| Transmitter | Receiver | Line | Data Name |
|-------------|----------|------|-----------|
|             | Main     |      | Engine    |

|     |             |     |             |
|-----|-------------|-----|-------------|
| ECM | Body<br>ECU | CAN | RPM<br>Data |
|-----|-------------|-----|-------------|

#### 4. AUTOMATIC HIGH BEAM SYSTEM

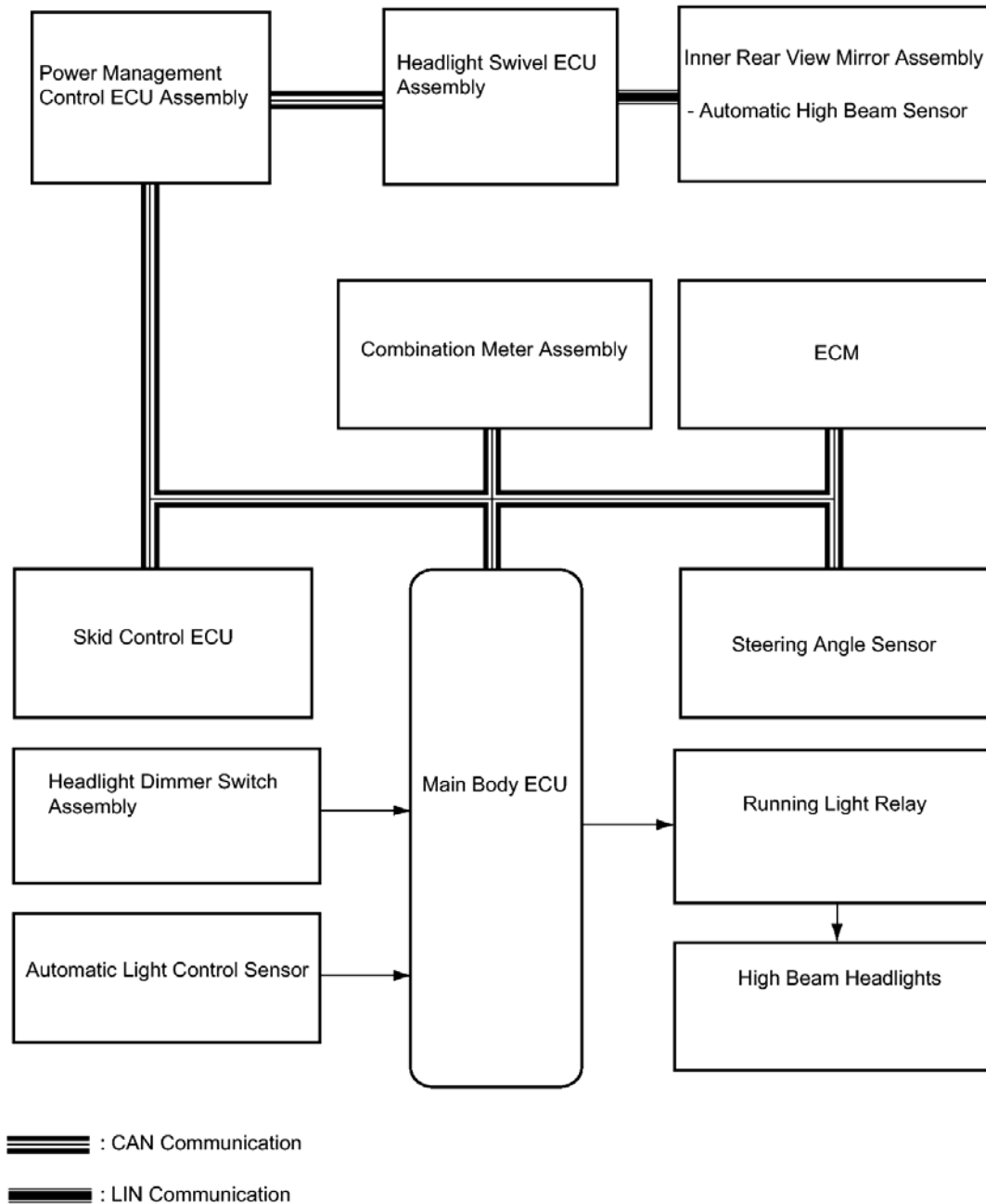


**Fig. 9: Automatic High Beam System Diagram**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**COMMUNICATION TABLE**

| Transmitter                     | Receiver                      | Line | Data Name                                     |
|---------------------------------|-------------------------------|------|-----------------------------------------------|
| Inner Rear View Mirror Assembly | Headlight Swivel ECU Assembly | LIN  | High Beam ON Request                          |
| Steering Angle Sensor           | Headlight Swivel ECU Assembly | CAN  | Data Continuity (Valid/Invalid) Flag          |
|                                 |                               |      | +B Disconnection                              |
|                                 |                               |      | Sensor Error                                  |
|                                 |                               |      | Zero Point Memory Invalid/Valid Inside Sensor |
|                                 |                               |      | Memorized Zero Point Value Inside Sensor      |
|                                 |                               |      | Steering Signal                               |
| Skid Control ECU                | Headlight Swivel ECU Assembly | CAN  | Front Right Wheel Speed Sensor Error Flag     |
|                                 |                               |      | Front Right Wheel Speed                       |
| ECM                             | Headlight Swivel ECU Assembly | CAN  | Shift Position R Signal                       |
| Main Body ECU                   | Headlight Swivel ECU Assembly | CAN  | Automatic High Beam Enable                    |
| Main Body ECU                   | Combination Meter Assembly    | CAN  | Automatic High Beam Indicator                 |
| Headlight Swivel ECU Assembly   | Main Body ECU                 | CAN  | Automatic High Beam Request                   |
|                                 |                               |      | Failure of Automatic High Beam Sensor         |
|                                 |                               |      | Condition of                                  |

|  |  |  |                                  |
|--|--|--|----------------------------------|
|  |  |  | Automatic<br>High Beam<br>Sensor |
|--|--|--|----------------------------------|

## 5. HID HEADLIGHT SYSTEM

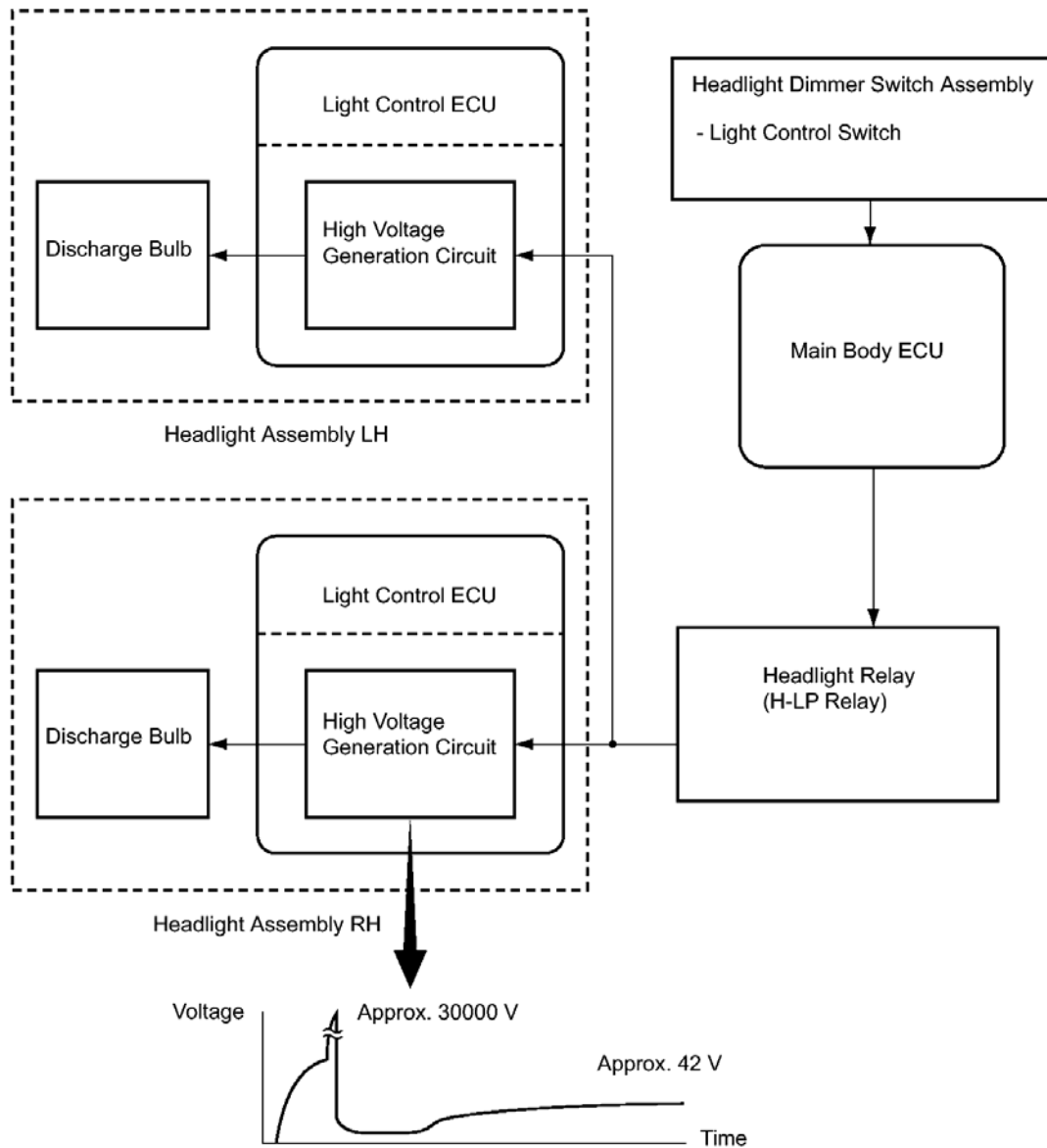


**Fig. 10: HID System Diagram**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. DOOR MIRROR FOOT LIGHT SYSTEM

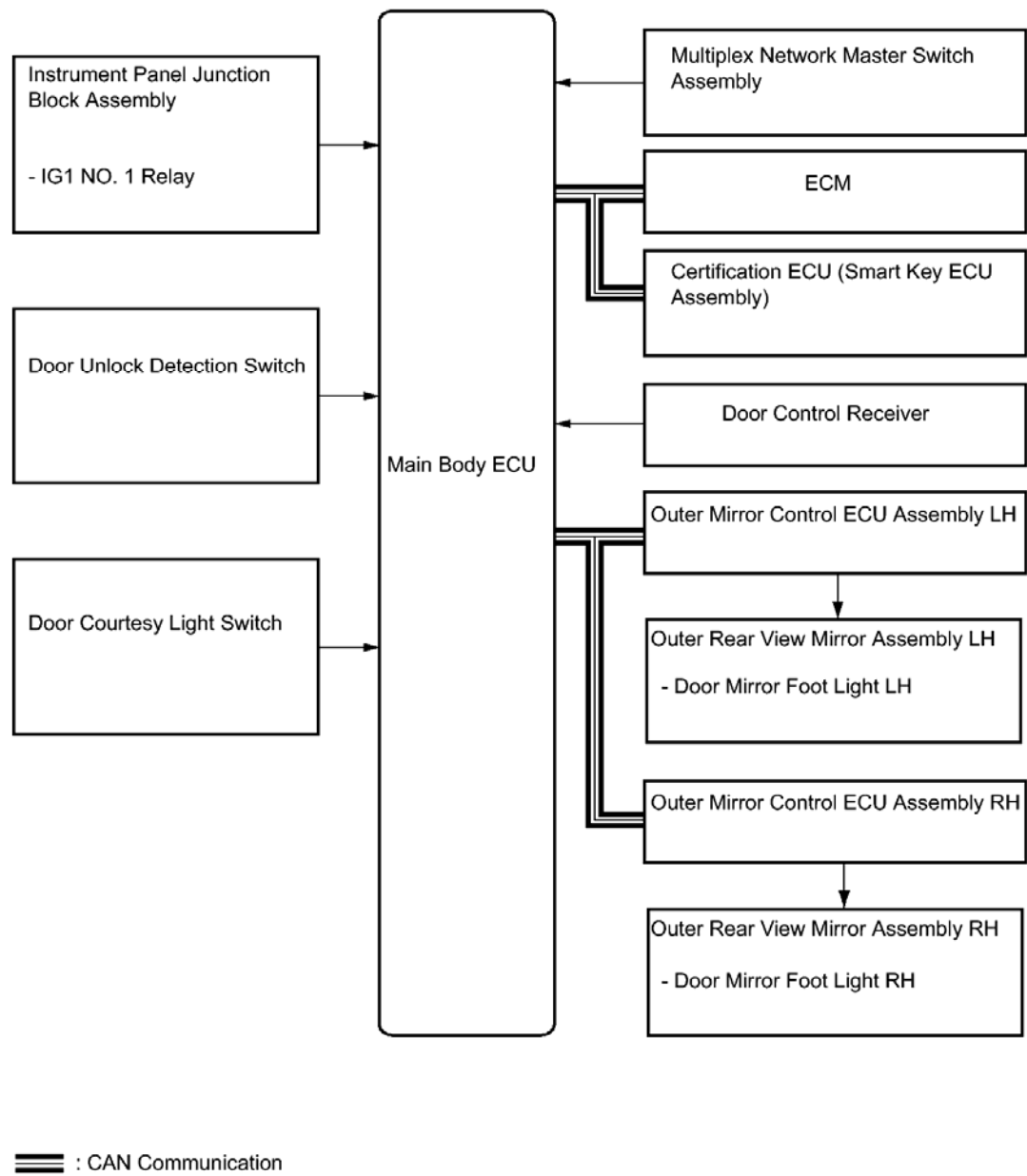


**Fig. 11: Door Mirror Foot Light System Diagram**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**COMMUNICATION TABLE**

| Transmitter | Receiver | Line | Data Name |
|-------------|----------|------|-----------|
|             |          |      |           |

|                                            |                              |     |                                         |
|--------------------------------------------|------------------------------|-----|-----------------------------------------|
| Main Body ECU                              | Outer Mirror ECU Assembly LH | CAN | Door Mirror Foot Light On Demand Signal |
| ECM                                        | Main Body ECU                | CAN | Shift Position P Signal                 |
| Certification ECU (Smart Key ECU Assembly) | Main Body ECU                | CAN | Wireless Door Lock Signal               |
| Main Body ECU                              | Outer Mirror ECU Assembly RH | CAN | Door Mirror Foot Light On Demand Signal |

## SYSTEM DESCRIPTION

### SYSTEM DESCRIPTION

#### 1. AUTOMATIC LIGHT CONTROL SYSTEM

When the light control switch is in the AUTO position, the automatic light control system detects ambient light levels and controls the low beam headlights, parking lights, taillights, marker lights and license plate lights.

#### 2. LIGHT AUTO TURN-OFF SYSTEM

The light auto turn-off system is used to prevent the exterior lights from being accidentally left on (low beam headlights, high beam headlights, front fog lights, taillights, parking lights, license plate lights and marker lights).

- This system has the following functions.

| Function | Outline                                                              |
|----------|----------------------------------------------------------------------|
|          | The exterior lights automatically turn off when all of the following |

|                                  |                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Driver Side Door-linked Function | <p>conditions have been met:</p> <ul style="list-style-type: none"> <li>• The ignition switch is turned from ON to off.</li> <li>• The light control switch is in the tail position.</li> <li>• The driver side door is opened.</li> </ul>                                                                                                                 |
| Delay Function                   | <p>The exterior lights automatically turn off after 30 seconds when all of the following conditions have been met:</p> <ul style="list-style-type: none"> <li>• The ignition switch is turned from ON to off.</li> <li>• The low beam headlights are on (Light control switch is in the head or AUTO position).</li> <li>• All doors are closed</li> </ul> |

|                                          |                                                                                                                                                                                                                                                  |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          | after any of the doors are opened.                                                                                                                                                                                                               |
| Door Control Transmitter-linked Function | <p>The exterior lights turn off immediately when the delay function is active and the following condition has been met:</p> <ul style="list-style-type: none"> <li>• The lock button on the key is pushed after all doors are locked.</li> </ul> |

### 3. DAYTIME RUNNING LIGHT SYSTEM

The daytime running light system is designed to automatically illuminate the dimmed high beam headlights, during the daytime to make the vehicle more visible to other vehicles.

- This system is controlled by the main body ECU and running light relay. The main body ECU transmits a turn ON signal to the running light relay, which illuminates the high beam headlights using duty control.
- This system is enabled when the following conditions are met:
  - Ignition switch ON
  - Engine speed signal input (engine running)
  - Parking brake switch off
  - Light control switch not in the DRL OFF position (w/ DRL OFF switch)
  - Light control switch is in the off (w/o DRL OFF switch), tail or AUTO position (and the low beam headlights are not turned on via the automatic light control system).

### 4. AUTOMATIC HIGH BEAM SYSTEM

#### a. General

The automatic high beam system enhances the illumination of the area to the front of the vehicle to improve visibility for the driver. It works by detecting light from the front using the camera built into the inner rear view mirror assembly and turning the high beams of the headlights on or off automatically.

b. Function of Main Components

| Component                                                    | Outline                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Automatic High Beam Sensor (Inner Rear View Mirror Assembly) | Determines when to turn the high beams on and off after identifying the lights of oncoming vehicles, preceding vehicles and other lights from the picture information of its camera sensor. Then, it sends high beam request signals to the headlight swivel ECU assembly via LIN.                                                                                                                             |
| Headlight Swivel ECU Assembly                                | Acts as the gateway between the automatic high beam sensor (inner rear view mirror assembly) which uses LIN communication and the CAN V2 bus. In addition, it stores Diagnostic Trouble Codes (DTCs) if an automatic high beam sensor (inner rear view mirror assembly) malfunction occurs.<br><b>HINT:</b><br>Even though the vehicle is not equipped with AFS, an headlight swivel ECU assembly is provided. |
| Power Management                                             | Performs the gateway function                                                                                                                                                                                                                                                                                                                                                                                  |

|                       |                                                                                                                                                                                                                                                                                    |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Control ECU Assembly  | between the V1 bus and V2 bus.                                                                                                                                                                                                                                                     |
| Steering Angle Sensor | Outputs the steering angle information to the headlight swivel ECU assembly.                                                                                                                                                                                                       |
| Skid Control ECU      | Outputs the information about the speed of the right front wheel. This information is used by the automatic high beam sensor (inner rear view mirror assembly) to turn the high beams on and off.                                                                                  |
| ECM                   | Outputs a signal to indicate that the shift lever is in R. Based on this signal, the automatic high beam sensor (inner rear view mirror assembly) turns the high beams off.                                                                                                        |
|                       | <p>Displays automatic high beam indicator light when it receives illuminate or blink request signals from the main body ECU.</p> <p><b>HINT:</b></p> <ul style="list-style-type: none"> <li>• The automatic high beam indicator light flashes to inform the driver when</li> </ul> |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Combination Meter Assembly | <p>the malfunction is in this system.</p> <ul style="list-style-type: none"> <li>• The automatic high beam indicator light illuminates to inform the driver when the automatic high beam system is activated.</li> <li>• The automatic high beam indicator light will turn off when there is bad weather (deep fog, heavy rain, etc.), an abnormal condition with front windshield (snow, ice, etc.), or an obstruction to the camera field of view (parking tag, etc.).</li> </ul> |
|                            | <ul style="list-style-type: none"> <li>• Receives the light control switch AUTO position and dimmer switch high position signals from</li> </ul>                                                                                                                                                                                                                                                                                                                                    |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Main Body ECU | <p>the headlight dimmer switch assembly, and receives the automatic light control sensor signal to determine the low beam headlight illumination condition, and sends this information to the headlight swivel ECU assembly. These are used to put the automatic high beam system in standby mode.</p> <ul style="list-style-type: none"> <li>• Receives high beam drive request signals from the headlight swivel ECU assembly, and outputs the duty control value to the running light relay.</li> <li>• Performs illumination control for the automatic high beam system and</li> </ul> |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                     |                                                                                                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------|
|                     | stores Diagnostic Trouble Codes (DTCs) when the system malfunctions.                                                   |
| Running Light Relay | Performs duty control for the high beam bulbs based on drive request signals that are received from the main body ECU. |

c. Basic Function

1. When all of the following conditions are met, the automatic high beam system is activated and the automatic high beam indicator light turns on:
  - The ignition switch is ON.
  - The light control switch is in the AUTO position and the low beam headlights are on.
  - The dimmer switch is in the high position.
  - Automatic High Beams is turned on in the customizable features.
2. When the following conditions are met, the high beams automatically turn on after a short delay:
  - Vehicle speed is approximately 34 km/h (21 mph) or more.
  - The area in front of the vehicle is dark.
  - There are no oncoming vehicles with headlights on.
  - There are no preceding vehicles with taillights on.
  - There are few streetlights along the street ahead.
3. When any of the following conditions are met, the high beams automatically turn off after a short delay:
  - Vehicle speed is less than 27 km/h (17 mph).
  - The level of ambient light is higher than a specified threshold.
  - There are oncoming vehicles with headlights on.
  - There are preceding vehicles with taillights on.
  - There are several streetlights along the street ahead.
4. When any of the following conditions are met, the automatic high beam system will be canceled and the indicator light will turn off.
  - The ignition switch is turned off.
  - The light control switch is turned to any position except the AUTO position.
  - The light control switch is in the AUTO position, however the low beams are not on.

- The dimmer switch is moved to the low position.
- The customizable feature is set to turn off the Automatic High Beams feature.

**HINT:**

It is possible to manually switch between the high beams and low beams using either of the following operations:

- Turn the light control switch from the AUTO position to the head position. In this case, the high beams turn on according to the dimmer switch high position. To change to the low beams, move the dimmer switch to the low position.
- Move the dimmer switch from the high position to the low position. In this case, the low beams turn on according to the dimmer switch position.

**HINT:**

The automatic high beam system monitors the area in front of the vehicle using the camera built into the inner rear view mirror assembly and makes a judgment to turn on the high beams when the surrounding area is dark (there are no headlights from oncoming vehicles and no taillights from vehicles in front). High beam control limitations:

- When the surrounding area is not dark enough, the low beams will remain on even if the headlights are turned on by the automatic light control system and the automatic high beam indicator light on the combination meter assembly illuminates. (The light level sufficient to turn the auto low beams on is not the same as the light level required to automatically illuminate the high beams.)
- When an oncoming vehicle suddenly appears at a sharp curve or a vehicle crosses the path of the vehicle, the high beams may remain on.
- When the fog lights of an oncoming vehicle are detected, the high beams may be turned off.
- The timing of the high beams turning on and off may differ depending on the brightness of headlights or fog lights from oncoming vehicles or the taillights of preceding vehicles.
- The timing of the high beams turning on and off may differ between normal conditions (good weather) and when driving on wet, frozen or snowy roads.
- The timing of the high beams turning on and off may differ depending on the number of occupants and amount of cargo present.
- On some occasions, the high beams and low beams may change unexpectedly.

**HINT:**

The camera built into the inner rear view mirror assembly continually monitors the light level in the area to the front of the vehicle. There is a delay in turning on the high beams. Even when there is no ambient light, the high beams will not turn on immediately. The delay will vary depend on the situation.

## 5. HID HEADLIGHT SYSTEM

The High Intensity Discharge (HID) headlight system uses a discharge bulb as its light source for the low beam. Discharge bulbs have superior illumination performance compared to halogen bulbs.

- Discharge bulbs have the following features:
  - The light emitted by the bulb is close in color to sunlight. The light shines further forward and over a broader area, increasing the area visible to the driver.
  - Less power is consumed.
- This system consists of the discharge bulbs and light control ECUs.
- The light control ECU transforms voltage that is input from the battery to high voltage of up to 30000 V and applies it to the discharge bulbs in order to illuminate them.

## 6. DOOR MIRROR FOOT LIGHT SYSTEM

### a. Function of Main Components

| Component                |        | Function                                                                                                                                               |
|--------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Main Body ECU            |        | The main body ECU receives various signals and outputs the request signals to the outer mirror control ECU to illuminate the outer mirror foot lights. |
| Outer Mirror Control ECU | LH, RH | The outer mirror control ECU receives request signals and illuminates the outer mirror foot lights.                                                    |
|                          |        | The door lock switch                                                                                                                                   |

|                                            |                         |                                                                                                                                                                |
|--------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Door Lock Switch                           | Driver, Front Passenger | outputs the lock/unlock signal to the main body ECU or the multiplex network master switch assembly.                                                           |
| Multiplex Network Master Switch Assembly   |                         | The multiplex network master switch assembly receives the door lock/unlock signal from the driver side door lock switch and transmits it to the main body ECU. |
| Certification ECU (Smart Key ECU Assembly) |                         | The certification ECU (smart key ECU assembly) judges and certifies the ID code.                                                                               |
| ECM                                        |                         | The ECM receives the shift position signals from the park/neutral position switch and transmits them to the                                                    |

|                              |                                                                                                                            |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|                              | main body ECU.                                                                                                             |
| Courtesy Switch              | The courtesy switch detects whether a door is open or closed and transmits a signal to the main body ECU.                  |
| Door Unlock Detection Switch | The door unlock detection switch detects whether a door is locked or unlocked and transmits a signal to the main body ECU. |

b. Operating Condition

1. The outer mirror foot light system operates as follows

| Function | Operation Condition                                                                                                                                                                                                                        |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | <p>When all of the following conditions are met, the outer mirror lights automatically turn on:</p> <ul style="list-style-type: none"> <li>• The ignition switch is off.</li> <li>• All doors are closed.</li> <li>• The key is</li> </ul> |

|                              |                                                                                                                                                                                                                                                       |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Actuation<br>Area-<br>linked | detected in the<br>actuation area                                                                                                                                                                                                                     |
|                              | <p>When the following conditions are met, the outer mirror lights automatically turn off:</p> <ul style="list-style-type: none"> <li>• The key is not detected in the actuation area.</li> </ul>                                                      |
| Door<br>Unlock-<br>linked    | <p>When all of the following conditions are met, the outer mirror lights automatically turn on:</p> <ul style="list-style-type: none"> <li>• The ignition switch is off.</li> <li>• Any door is unlocked.</li> <li>• All doors are closed.</li> </ul> |
| Door<br>Lock-<br>linked      | <p>When the following condition is met, the outer mirror lights automatically turn on:</p> <ul style="list-style-type: none"> <li>• Any door is opened and then closed.</li> </ul>                                                                    |
| Delay                        | <p>When approximately 15 seconds elapse after one of the following conditions are met, the outer mirror lights turn off:</p> <ul style="list-style-type: none"> <li>• An actuation area-linked</li> </ul>                                             |

|                       |                                                                                                                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | <p>function is used.</p> <ul style="list-style-type: none"> <li>• The door unlock-linked is active.</li> <li>• Any door is opened and then closed.</li> </ul>                                                               |
| Shift Position-linked | <p>When all of the following conditions are met, the outer mirror lights automatically turn off:</p> <ul style="list-style-type: none"> <li>• The ignition switch is ON.</li> <li>• Shift lever is moved from P.</li> </ul> |

## HOW TO PROCEED WITH TROUBLESHOOTING

### HOW TO PROCEED WITH TROUBLESHOOTING

#### HINT:

- Use the following procedure to troubleshoot the lighting system.
- \*: Use the Techstream.

#### 1. VEHICLE BROUGHT TO WORKSHOP

**NEXT: Go to next step**

#### 2. CUSTOMER PROBLEM ANALYSIS CHECK AND SYMPTOM CHECK

**NEXT: Go to next step**

#### 3. INSPECT 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 CAN COMMUNICATION SYSTEM\*

- a. Use the Techstream to check if the CAN communication system is functioning normally.

##### RESULT

| Result                                      | Proceed to |
|---------------------------------------------|------------|
| CAN communication system DTC is not output. | A          |
| CAN communication system DTC is output.     | B          |

**B --> GO TO CAN COMMUNICATION SYSTEM**

**A: Go to next step**

#### 5. CHECK FOR DTC\*

##### RESULT

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

**B --> Go to step 8**

**A: Go to next step**

#### 6. PROBLEM SYMPTOMS TABLE

##### RESULT

| Result                                  | Proceed to |
|-----------------------------------------|------------|
| Fault is not listed in Problem Symptoms | A          |

|                                            |   |
|--------------------------------------------|---|
| Table.                                     |   |
| Fault is listed in Problem Symptoms Table. | B |

**B --> Go to step 8**

**A: Go to next step**

## **7. OVERALL ANALYSIS AND TROUBLESHOOTING\***

- Data List / Active Test. Refer to **DATA LIST / ACTIVE TEST**
- Terminals of ECU. Refer to **TERMINALS OF ECU**

**NEXT: Go to next step**

## **8. ADJUST, REPAIR OR REPLACE**

**NEXT: Go to next step**

## **9. CONFIRMATION TEST**

**NEXT --> END**

## **OPERATION CHECK**

### **OPERATION CHECK**

#### **1. AUTOMATIC LIGHT CONTROL SYSTEM OPERATION CHECK**

- Turn the ignition switch to ON.
- Turn the light control switch to the AUTO position.
- Cover the automatic light control sensor.
- Check that the taillights and low beam headlights come on.
- Uncover the automatic light control sensor.
- Check that the low beam headlights and taillights go off.

#### **2. LIGHT AUTO TURN-OFF SYSTEM OPERATION CHECK**

- When only the taillights are on.
  - Close the driver side door.
  - Turn the ignition switch to ON.
  - Turn the light control switch to the tail position.
  - Turn the ignition switch off.
  - Open the driver side door.

6. Check that the taillights go off immediately.
- b. When low beam headlights are on.
  1. Close all of the doors.
  2. Turn the ignition switch to ON.
  3. Turn the low beam headlights, high beam headlights or front fog lights on.
  4. Turn the ignition switch off.
  5. Open any door.
  6. Close all of the doors.
  7. Check that all of lights go off after 30 seconds (delay function).

**HINT:**

If the lock button on the key is pushed after the doors are locked, all lights will go off immediately.

**3. DAYTIME RUNNING LIGHT SYSTEM OPERATION CHECK**

- a. Turn the light control switch off (w/o DRL OFF switch).
- b. Turn the light control switch to tail position (w/ DRL OFF switch).
- c. Start the engine.
- d. Release the parking brake.
- e. Check that the daytime running lights (dimmed high beam headlights) come on.

**4. AUTOMATIC HIGH BEAM SYSTEM OPERATION CHECK**

- a. Check the operation of the inner rear view mirror assembly indicator light.
  1. Turn the ignition switch to ON.
  2. Check that the inner rear view mirror assembly indicator light comes on.

\*1

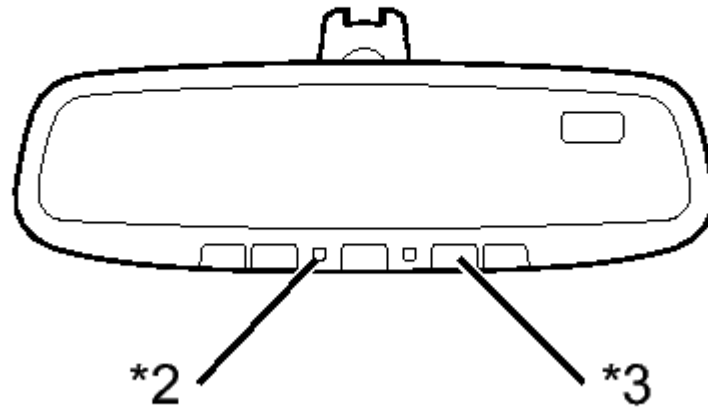


**Fig. 12: Checking Automatic High Beam System Operation**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**TEXT IN ILLUSTRATION**

|    |                                             |
|----|---------------------------------------------|
| *1 | Inner<br>Rear<br>View<br>Mirror<br>Assembly |
| *2 | Indicator<br>Light                          |
| *3 | AUTO<br>MODE<br>Switch                      |

3. Press the inner rear view mirror assembly AUTO MODE switch once.
4. Check that the inner rear view mirror assembly indicator light goes off.
5. Press the inner rear view mirror assembly AUTO MODE switch once again.
6. Check that the inner rear view mirror assembly indicator light comes on.

**HINT:**

If the inner rear view mirror assembly indicator light flashes, turn the ignition switch off then turn the ignition switch to ON. If the inner rear view mirror assembly indicator light flashes continuously, replace the inner rear view mirror assembly.

b. Check the operation of the automatic high beam indicator light.

1. Turn the ignition switch to ON.
2. Move the shift lever to any position except R.
3. Turn the light control switch to the AUTO position.
4. Cover the automatic light control sensor to turn the low beam headlights on.
5. Turn the dimmer switch to the high position.
6. Check that the automatic high beam indicator comes on.

**HINT:**

Make sure the Automatic High Beams is turned on in the customizable features.

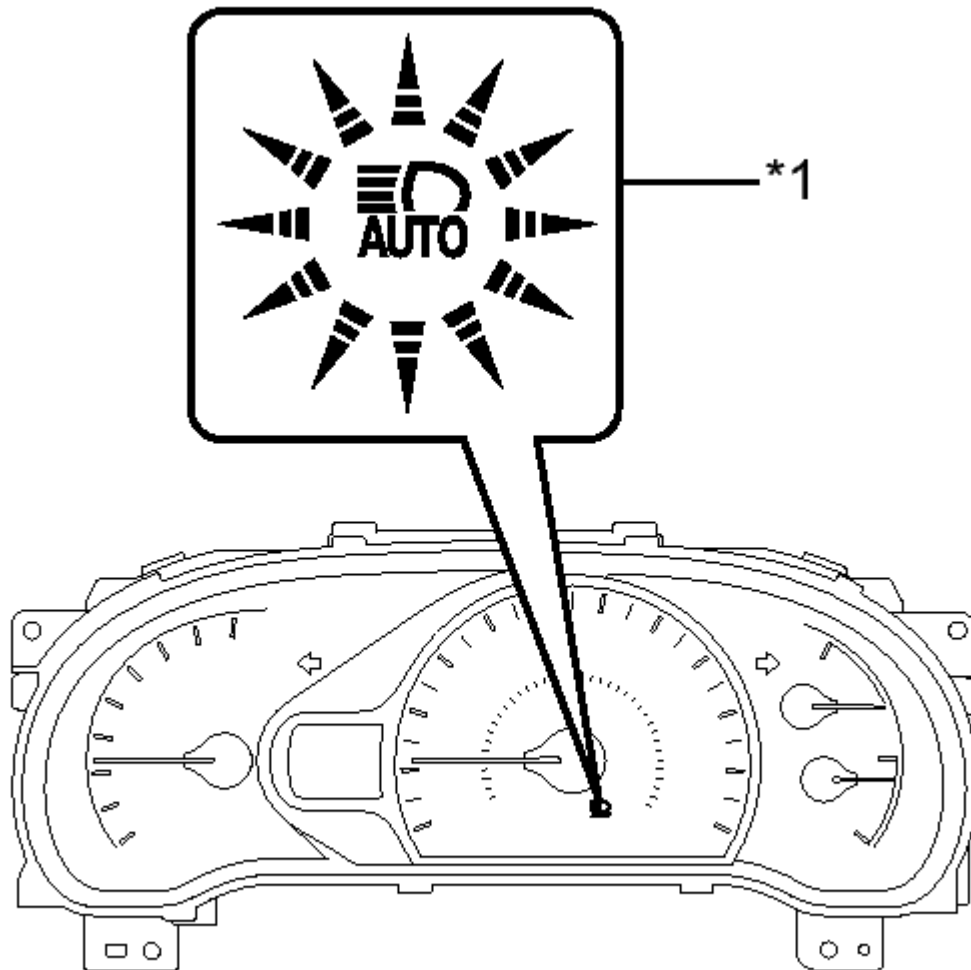
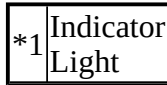


**Fig. 13: Identifying Automatic High Beam Indicator**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### TEXT IN ILLUSTRATION



- c. Check the operation of the automatic high beam function.
1. At night, when driving the vehicle with the automatic high beam system in standby mode, check that the high beams automatically turn on after a short delay when all of the following conditions are met:
    - Vehicle speed is approximately 34 km/h (21 mph) or more.
    - The area in front of the vehicle is dark.
    - There are no oncoming vehicles with headlights on.
    - There are no preceding vehicles with taillights on.
    - There are few streetlights along the street ahead.

#### HINT:

During the test, make sure the camera is not blocked.

2. At night, when driving the vehicle with the high beams turned on by the automatic high beam system, check that the automatic high beam system turns off the high beams and returns to standby mode when any of the following conditions are met:
  - Vehicle speed is less than 27 km/h (17 mph).
  - The level of ambient light is higher than a specified threshold.
  - There are oncoming vehicles with headlights on.
  - There are preceding vehicles with taillights on.
  - Light from streetlights ahead is higher than a specified threshold.

#### HINT:

During the test, make sure the camera is not blocked.

- d. Using the following procedure, the automatic high beam operation can be checked without driving the vehicle.
1. Connect terminals 4 (CG) and 8 (LVL) of the DLC3 using SST.
    - **SST: 09843-18040**

\*a

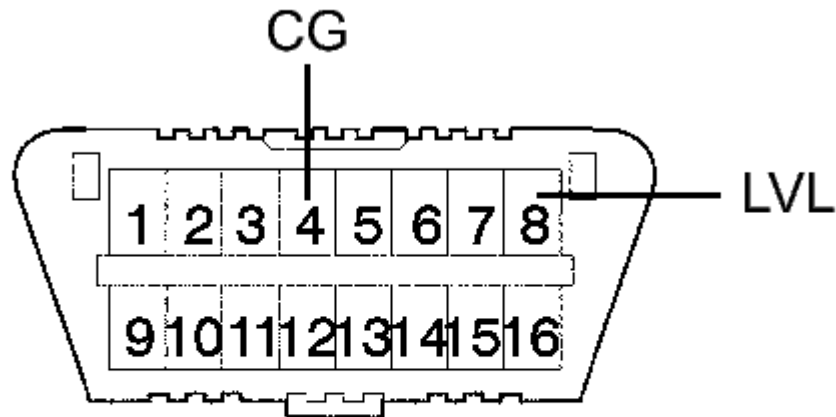


**Fig. 14: Checking Automatic High Beam Operation (Without Driving Vehicle)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**TEXT IN ILLUSTRATION**

\*a DLC3

2. Turn the ignition switch to ON.
3. Disconnect SST within 10 seconds after turning the ignition switch to ON.
4. After more than 1 second and less than 10 seconds, connect terminals 4 (CG) and 8 (LVL) of the DLC3 using SST again.
5. Check that the inner rear view mirror assembly indicator light flashes.
6. Check that the high beam headlights come on when the surrounding area is dark enough.
7. Shine a flashlight, white LED or red LED on the camera built into the inner rear view mirror assembly.
8. Check that the high beam headlights go off.

**NOTE:** The high beams may not turn on or may not change to low beams when the surrounding area is bright or due to other lighting conditions. Therefore, this function check should not be used as the only method of determining if a malfunction is present (if parts need to be replaced).

**5. DOOR MIRROR FOOT LIGHT SYSTEM OPERATION CHECK**

- a. The outer mirror foot light system operates as follows



| Operation                                    | Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Illuminate for 15 seconds, and then fade out | <p>When any of the following conditions is met, the lights illuminate for 15 seconds, and then fade out:</p> <ul style="list-style-type: none"> <li>• The key enters any actuation area around the doors when the engine switch is off and all doors are closed*1.</li> <li>• Any door is unlocked when the engine switch is off, all doors are closed and locked.</li> <li>• Either driver door control switch or front passenger door control switch is turned to unlock position</li> </ul> |

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | when ignition switch is ON and shift lever is in P.                                                                                                                                                                                                                                                                                                                                                                                                  |
| Fade out immediately | <p>When any of the following conditions is met, the lights fade out immediately:</p> <ul style="list-style-type: none"> <li>• The ignition switch is turned from off to ACC when all doors are closed.</li> <li>• All doors are locked when the ignition switch is off, all doors are closed and any door is unlocked.</li> <li>• All doors are locked again when all doors are closed and locked.</li> <li>• The shift lever is moved to</li> </ul> |

|  |                                                           |
|--|-----------------------------------------------------------|
|  | any position other than P when the ignition switch is ON. |
|--|-----------------------------------------------------------|

**HINT:**

\*1: When the lights are on, if the key leaves the actuation areas around the doors, after approximately 3 seconds, the door mirror foot lights fade out.

## CUSTOMIZE PARAMETERS

### CUSTOMIZE PARAMETERS

#### 1. CUSTOMIZING FUNCTION WITH TECHSTREAM

**HINT:**

The following items can be customized.

**NOTE:**

- When the customer requests a change in a function, first make sure that the function can be customized.
- Be sure to make a note of the current settings before customizing.
- When troubleshooting a function, first make sure that the function is set to the default setting.

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Enter the following menus: Customize Setting / Light Control.
- e. Select the setting by referring to the table below.

#### LIGHT CONTROL

| Display | Default | Content                                                              | Setting         |
|---------|---------|----------------------------------------------------------------------|-----------------|
|         |         | Changes the ambient brightness level required to dim the lights such | LIGHT2, LIGHT1, |

|                            |        |                                                                                                                                                                                                                      |                                                    |
|----------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Disp Ex<br>ON Sen          | NORMAL | as the<br>indicator<br>lights of the<br>combination<br>meter, A/C<br>indicator<br>light and<br>clock.                                                                                                                | NORMAL,<br>DARK1 or<br>DARK2                       |
| Disp Ex<br>OFF Sen         | NORMAL | Changes the<br>ambient<br>brightness<br>level<br>required to<br>cancel the<br>dimming of<br>the lights<br>such as the<br>indicator<br>lights of the<br>combination<br>meter, A/C<br>indicator<br>light and<br>clock. | LIGHT2,<br>LIGHT1,<br>NORMAL,<br>DARK1 or<br>DARK2 |
| Light<br>Auto OFF<br>Delay | 30 s   | Keeps the<br>headlights<br>on for a<br>certain<br>period of<br>time after<br>turning the<br>ignition<br>switch off<br>and closing<br>all the doors<br>with the low<br>beam<br>headlights<br>on.                      | OFF, 30 s,<br>60 s or 90<br>s                      |
| Sensitivity                | Normal | Adjusts the<br>sensitivity<br>of the<br>automatic<br>light control<br>system.                                                                                                                                        | Light2,<br>Light1,<br>Normal,<br>Dark1 or<br>Dark2 |
| DRL<br>Function            | ON     | ON/OFF of<br>the DRL                                                                                                                                                                                                 | ON or<br>OFF                                       |

|                       |    |                                             |           |
|-----------------------|----|---------------------------------------------|-----------|
|                       |    | function                                    |           |
| Automatic High Beams* | ON | ON/OFF of the automatic high beam function. | ON or OFF |

\*: w/ HID Headlight System

## PROBLEM SYMPTOMS TABLE

### PROBLEM SYMPTOMS TABLE

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.

### HEADLIGHT AND TAILLIGHT

| Symptom                                                    | Suspected Area                                         | See                                                 |
|------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------|
| One low beam headlight does not illuminate.                | Bulb (for Halogen Headlight)                           | -                                                   |
|                                                            | Discharge headlight bulb (w/ HID Headlight System)     | Refer to <b><u>ON-VEHICLE INSPECTION</u></b>        |
|                                                            | Integration relay (w/o HID Headlight System)           | -                                                   |
|                                                            | Headlight Relay (H-LP Relay) (w/ HID Headlight System) | -                                                   |
|                                                            | Harness or connector                                   | -                                                   |
|                                                            | Light control ECU (w/ HID Headlight System)            | Refer to <b><u>COMPONENTS</u></b>                   |
| Both left and right low beam headlights do not illuminate. | Light control switch circuit                           | Refer to <b><u>Light Control Switch Circuit</u></b> |
|                                                            | Headlight relay circuit                                | Refer to <b><u>Headlight Relay Circuit</u></b>      |
|                                                            | Integration relay*1                                    | -                                                   |
|                                                            | Headlight Relay (H-LP Relay)*2                         | -                                                   |
|                                                            | Harness or connector                                   | -                                                   |
|                                                            | Instrument panel junction block assembly               | -                                                   |
|                                                            | Main body ECU                                          | Refer to <b><u>COMPONENTS</u></b>                   |
|                                                            | H-LP LH HI fuse or H-LP RH HI fuse                     | -                                                   |
|                                                            | Bulb                                                   | -                                                   |

|                                                                                                          |                                                       |                                                     |
|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------|
| One high beam headlight does not illuminate.                                                             | Running light relay (w/ Daytime Running Light System) | Refer to <b><u>COMPONENTS</u></b>                   |
|                                                                                                          | Harness or connector                                  | -                                                   |
| Both left and right high beam headlights do not illuminate.                                              | Light control switch circuit                          | Refer to <b><u>Light Control Switch Circuit</u></b> |
|                                                                                                          | High beam headlight circuit                           | Refer to <b><u>Headlight (HI-BEAM) Circuit</u></b>  |
|                                                                                                          | Running light relay (w/ Daytime Running Light System) | Refer to <b><u>COMPONENTS</u></b>                   |
|                                                                                                          | DIM relay (w/o Daytime Running Light System)          | -                                                   |
|                                                                                                          | Instrument panel junction block assembly              | -                                                   |
|                                                                                                          | Main body ECU                                         | Refer to <b><u>COMPONENTS</u></b>                   |
| "High Flash" (passing function) headlight does not illuminate (high beam headlights are normal).         | Light control switch circuit                          | Refer to <b><u>Light Control Switch Circuit</u></b> |
|                                                                                                          | Instrument panel junction block assembly              | -                                                   |
|                                                                                                          | Main body ECU                                         | Refer to <b><u>COMPONENTS</u></b>                   |
| Discharge headlight bulb flickers.                                                                       | Harness or connector                                  | -                                                   |
|                                                                                                          | Discharge headlight bulb                              | Refer to <b><u>ON-VEHICLE INSPECTION</u></b>        |
|                                                                                                          | Light control ECU                                     | Refer to <b><u>COMPONENTS</u></b>                   |
| Discharge headlight bulb is dark.                                                                        | Harness or connector                                  | -                                                   |
|                                                                                                          | Discharge headlight bulb                              | Refer to <b><u>ON-VEHICLE INSPECTION</u></b>        |
|                                                                                                          | Light control ECU                                     | Refer to <b><u>COMPONENTS</u></b>                   |
| Discharge headlight bulb does not come on at intervals.                                                  | Harness or connector                                  | -                                                   |
|                                                                                                          | Discharge headlight bulb                              | Refer to <b><u>ON-VEHICLE INSPECTION</u></b>        |
|                                                                                                          | Light control ECU                                     | Refer to <b><u>COMPONENTS</u></b>                   |
| One front parking/side marker light does not illuminate.                                                 | Bulb                                                  | -                                                   |
|                                                                                                          | Harness or connector                                  | -                                                   |
| One rear taillight does not illuminate.                                                                  | Bulb                                                  | -                                                   |
|                                                                                                          | Harness or connector                                  | -                                                   |
| One rear side marker does not illuminate.                                                                | Bulb                                                  | -                                                   |
|                                                                                                          | Harness or connector                                  | -                                                   |
| One license plate light does not illuminate.                                                             | Bulb                                                  | -                                                   |
|                                                                                                          | Harness or connector                                  | -                                                   |
| All of the lights (rear taillights, front parking/side marker lights, license plate lights and rear side | TAIL fuse                                             | -                                                   |
|                                                                                                          | Light control switch circuit                          | Refer to <b><u>Light Control Switch Circuit</u></b> |
|                                                                                                          | Taillight relay circuit                               | Refer to <b><u>Taillight Relay Circuit</u></b>      |
|                                                                                                          | Instrument panel junction                             |                                                     |

|                                   |                |                                   |
|-----------------------------------|----------------|-----------------------------------|
| marker lights) do not illuminate. | block assembly | -                                 |
|                                   | Main body ECU  | Refer to <b><u>COMPONENTS</u></b> |

## STOP LIGHT

| Symptom                                      | Suspected Area                                 | See                               |
|----------------------------------------------|------------------------------------------------|-----------------------------------|
| One side stop light does not illuminate.     | Rear combination light assembly                | Refer to <b><u>COMPONENTS</u></b> |
|                                              | Harness or connector                           | -                                 |
| High mounted stop light does not illuminate. | High mounted stop light assembly               | Refer to <b><u>COMPONENTS</u></b> |
|                                              | Harness or connector                           | -                                 |
| All of lights do not illuminate.             | STOP fuse                                      | -                                 |
|                                              | ECU-IG fuse (w/ Dynamic Radar Cruise Control)  | -                                 |
|                                              | Stop light switch assembly                     | Refer to <b><u>INSPECTION</u></b> |
|                                              | STP LP relay (w/ Dynamic Radar Cruise Control) | -                                 |
|                                              | Stop light control relay                       | Refer to <b><u>COMPONENTS</u></b> |
|                                              | Harness or connector                           | -                                 |

## FRONT FOG LIGHT

| Symptom                                                                       | Suspected Area               | See                                                 |
|-------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------|
| One side front fog light does not illuminate.                                 | Bulb                         | -                                                   |
|                                                                               | Harness or connector         | -                                                   |
| Both left and right front fog lights do not illuminate (taillight is normal). | TAIL fuse                    | -                                                   |
|                                                                               | Light control switch circuit | Refer to <b><u>Light Control Switch Circuit</u></b> |
|                                                                               | Front fog light circuit      | Refer to <b><u>Front Fog Light Circuit</u></b>      |
|                                                                               | Integration relay            | -                                                   |
|                                                                               | Main body ECU                | Refer to <b><u>COMPONENTS</u></b>                   |

## BACK-UP LIGHT

| Symptom                                               | Suspected Area                           | See                               |
|-------------------------------------------------------|------------------------------------------|-----------------------------------|
| One back-up light does not illuminate.                | Bulb                                     | -                                 |
|                                                       | Harness or connector                     | -                                 |
| Both left and right back-up lights do not illuminate. | GAUGE NO. 1 fuse                         | -                                 |
|                                                       | Park/neutral position switch (for U660F) | Refer to <b><u>INSPECTION</u></b> |
|                                                       | Park/neutral position switch (for U660E) | Refer to <b><u>INSPECTION</u></b> |
|                                                       | Park/neutral position switch (for U760E) | Refer to <b><u>INSPECTION</u></b> |
|                                                       | Harness or connector                     | -                                 |

## TURN SIGNAL LIGHT

| Symptom                                                   | Suspected Area                                              | See                               |
|-----------------------------------------------------------|-------------------------------------------------------------|-----------------------------------|
| One turn signal light does not operate.                   | Bulb                                                        | -                                 |
|                                                           | Harness or connector                                        | -                                 |
|                                                           | Outer mirror control ECU (w/ Seat Position Memory)          | Refer to <b><u>COMPONENTS</u></b> |
|                                                           | Outer rear view mirror (w/ Seat Position Memory)            | Refer to <b><u>COMPONENTS</u></b> |
| Turn signal lights do not operate in one direction.       | Headlight dimmer switch assembly (Turn signal light switch) | Refer to <b><u>INSPECTION</u></b> |
|                                                           | Turn signal flasher assembly                                | Refer to <b><u>INSPECTION</u></b> |
|                                                           | Instrument panel junction block assembly                    | -                                 |
|                                                           | Harness or connector                                        | -                                 |
| All turn signal lights do not operate.                    | GAUGE NO. 1 fuse                                            | -                                 |
|                                                           | HAZ fuse                                                    | -                                 |
|                                                           | Headlight dimmer switch assembly (Turn signal light switch) | Refer to <b><u>INSPECTION</u></b> |
|                                                           | Turn signal flasher assembly                                | Refer to <b><u>INSPECTION</u></b> |
|                                                           | Harness or connector                                        | -                                 |
| All turn signal lights do not flash at the correct speed. | Bulb                                                        | -                                 |
|                                                           | Turn signal flasher assembly                                | Refer to <b><u>INSPECTION</u></b> |
|                                                           | Harness or connector                                        | -                                 |

## HAZARD WARNING LIGHT

| Symptom                               | Suspected Area               | See                               |
|---------------------------------------|------------------------------|-----------------------------------|
| Hazard warning lights do not operate. | HAZ fuse                     | -                                 |
|                                       | GAUGE NO. 1 fuse             | -                                 |
|                                       | Hazard warning switch        | Refer to <b><u>INSPECTION</u></b> |
|                                       | Turn signal flasher assembly | Refer to <b><u>INSPECTION</u></b> |
|                                       | Harness or connector         | -                                 |

## AUTOMATIC LIGHT CONTROL SYSTEM

| Symptom                                          | Suspected Area               | See                                                 |
|--------------------------------------------------|------------------------------|-----------------------------------------------------|
| Automatic light control system does not operate. | Check DTCs                   | Refer to <b><u>DTC CHECK / CLEAR</u></b>            |
|                                                  | Light control switch circuit | Refer to <b><u>Light Control Switch Circuit</u></b> |
|                                                  | IG signal circuit            | Refer to <b><u>IG Signal Circuit</u></b>            |
|                                                  | Main body ECU                | Refer to <b><u>COMPONENTS</u></b>                   |

## LIGHT AUTO TURN-OFF SYSTEM

| Symptom | Suspected Area | See |
|---------|----------------|-----|
|---------|----------------|-----|

|                                              |                              |                                                     |
|----------------------------------------------|------------------------------|-----------------------------------------------------|
| Light auto turn-off system does not operate. | Light control switch circuit | Refer to <b><u>Light Control Switch Circuit</u></b> |
|                                              | Door courtesy switch circuit | Refer to <b><u>Door Courtesy Switch Circuit</u></b> |
|                                              | IG signal circuit            | Refer to <b><u>IG Signal Circuit</u></b>            |
|                                              | Main body ECU                | Refer to <b><u>COMPONENTS</u></b>                   |

## DAYTIME RUNNING LIGHT SYSTEM

| Symptom                                        | Suspected Area                      | See                                                        |
|------------------------------------------------|-------------------------------------|------------------------------------------------------------|
| Daytime running light system does not operate. | Check CAN communication system      | -                                                          |
|                                                | Daytime running light relay circuit | Refer to <b><u>Daytime Running Light Relay Circuit</u></b> |
|                                                | Light control switch circuit        | Refer to <b><u>Light Control Switch Circuit</u></b>        |
|                                                | IG signal circuit                   | Refer to <b><u>IG Signal Circuit</u></b>                   |
|                                                | Parking brake switch circuit        | Refer to <b><u>Parking Brake Switch Circuit</u></b>        |
|                                                | High beam headlight circuit         | Refer to <b><u>Headlight (HI-BEAM) Circuit</u></b>         |
|                                                | Main body ECU                       | Refer to <b><u>COMPONENTS</u></b>                          |

## AUTOMATIC HIGH BEAM SYSTEM

| Symptom                                                                                                                                                         | Suspected Area                              | See                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------------------------------------------|
| Inner rear view mirror assembly indicator light does not come on when the ignition switch is turned from off to ON.                                             | Inner rear view mirror power source circuit | Refer to <b><u>Inner Rear View Mirror Power Source Circuit</u></b> |
|                                                                                                                                                                 | Inner rear view mirror assembly             | Refer to <b><u>COMPONENTS</u></b>                                  |
| Inner rear view mirror assembly indicator light remains on when the inner rear view mirror assembly AUTO switch is pressed.                                     | Inner rear view mirror assembly             | Refer to <b><u>COMPONENTS</u></b>                                  |
| Inner rear view mirror assembly indicator light flashes.                                                                                                        | Perform operation check                     | Refer to <b><u>OPERATION CHECK</u></b>                             |
|                                                                                                                                                                 | Inner rear view mirror assembly             | Refer to <b><u>COMPONENTS</u></b>                                  |
| Automatic high beam indicator light does not come on when the automatic high beam system is in standby mode (automatic light control system operates normally). | Perform operation check                     | Refer to <b><u>OPERATION CHECK</u></b>                             |
|                                                                                                                                                                 | Light control switch circuit                | Refer to <b><u>Light Control Switch Circuit</u></b>                |
|                                                                                                                                                                 | Combination meter assembly                  | Refer to <b><u>PROBLEM SYMPTOMS TABLE</u></b>                      |
| Automatic high beam system does not operate (automatic high beam indicator light flashes).                                                                      | Check DTCs                                  | Refer to <b><u>DTC CHECK / CLEAR</u></b>                           |
|                                                                                                                                                                 | Combination meter assembly                  | Refer to <b><u>PROBLEM SYMPTOMS TABLE</u></b>                      |
|                                                                                                                                                                 |                                             |                                                                    |

|                                                                                                 |                                                                  |                                                |
|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------|
| Automatic high beam system does not operate (automatic high beam indicator light is on or off). | Inner rear view mirror assembly (Camera detection malfunction*1) | Refer to <b><u>DATA LIST / ACTIVE TEST</u></b> |
|                                                                                                 | Inner rear view mirror assembly (Aiming misalignment*2)          | Refer to <b><u>DATA LIST / ACTIVE TEST</u></b> |

**NOTE:**      **\*1: Camera detection malfunctions can be detected using the Techstream. Under the following conditions, if the camera built into the inner rear view mirror assembly cannot detect other vehicles or lights correctly, it will stop automatic high beam control and turn off the automatic high beam indicator light:**

- When the front windshield is not clear (ice, snow or frost on the glass).
- When the front windshield is dirty (sand, mud, water stains or bugs are on the glass).

**\*2: Aiming misalignment of the camera can be detected using the Techstream. Under the following conditions, the camera built in to the rear view mirror assembly cannot adjust its center point:**

- When the inner rear view mirror assembly is on an angle due to mis-installation or damage to the camera.
- When the automatic aiming adjusting function of the mirror does not work correctly.

**If the camera aiming is misaligned, check the following conditions:**

- Check if the vehicle is inclined.
- Check if the windshield glass is installed correctly.
- Check if the inner rear view mirror assembly is installed correctly.
- Check if there is deformation of the camera or stay of the inner rear view mirror assembly.

#### **DOOR MIRROR FOOT LIGHT**

| Symptom                                         | Suspected Area                    | See                                                   |
|-------------------------------------------------|-----------------------------------|-------------------------------------------------------|
| One door mirror foot light does not illuminate. | Bulb                              | -                                                     |
|                                                 | Door mirror foot light circuit    | Refer to <b><u>Door Mirror Foot Light Circuit</u></b> |
|                                                 | Outer mirror control ECU assembly | Refer to <b><u>COMPONENTS</u></b>                     |
|                                                 | Power door lock                   | Refer to <b><u>HOW TO PROCEED WITH</u></b>            |

|                                                                |                                      |                                                             |
|----------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------|
| Both left and right door mirror foot lights do not illuminate. | control system                       | <b><u>TROUBLESHOOTING</u></b>                               |
|                                                                | Wireless door lock control system    | Refer to <b><u>HOW TO PROCEED WITH TROUBLESHOOTING</u></b>  |
|                                                                | Door mirror foot light circuit       | Refer to <b><u>Door Mirror Foot Light Circuit</u></b>       |
|                                                                | Door courtesy switch circuit         | Refer to <b><u>Door Courtesy Switch Circuit</u></b>         |
|                                                                | Door unlock detection switch circuit | Refer to <b><u>Door Unlock Detection Switch Circuit</u></b> |
|                                                                | IG signal circuit                    | Refer to <b><u>IG Signal Circuit</u></b>                    |
|                                                                | Main body ECU                        | Refer to <b><u>COMPONENTS</u></b>                           |

## TERMINALS OF ECU

### TERMINALS OF ECU

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

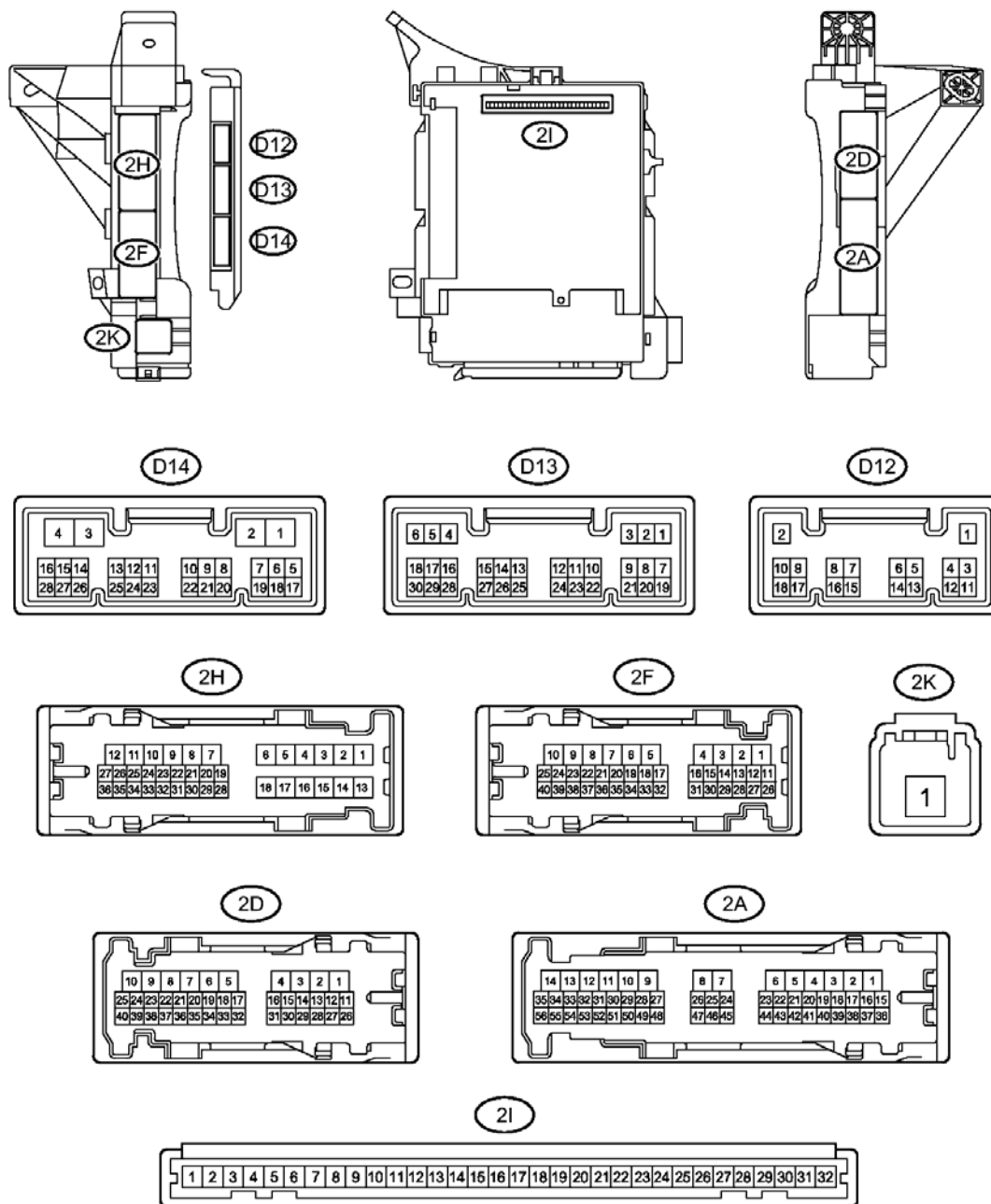


**Fig. 15: ECU Connector Terminal Identification - Main Body ECU & I/P Junction Block**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Disconnect the 2A, 2D, 2F, 2K, D13 and D14 instrument panel junction block assembly and main body ECU connectors.
- Measure the voltage according to the value(s) in the table below.

| Terminal |  |  |  |  |
|----------|--|--|--|--|
|----------|--|--|--|--|

| No.<br>(Symbol)                        | Wiring<br>Color       | Terminal<br>Description    | Condition                 | Specified<br>Condition |
|----------------------------------------|-----------------------|----------------------------|---------------------------|------------------------|
| 2A-36 -<br>Body<br>ground              | L -<br>Body<br>ground | ACC power<br>supply        | Ignition<br>switch<br>ACC | 11 to 14 V             |
|                                        |                       |                            | Ignition<br>switch off    | Below 1<br>V           |
| 2A-16 -<br>Body<br>ground              | Y -<br>Body<br>ground | IG power<br>supply         | Ignition<br>switch<br>ON  | 11 to 14 V             |
|                                        |                       |                            | Ignition<br>switch off    | Below 1<br>V           |
| 2F-39<br>(BECU)<br>*1 - Body<br>ground | W -<br>Body<br>ground | Battery<br>power<br>supply | Always                    | 11 to 14 V             |
| 2K-1 -<br>Body<br>ground               | W -<br>Body<br>ground | Battery<br>power<br>supply | Always                    | 11 to 14 V             |

\*1: w/o Smart Key System

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

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

| Terminal<br>No.<br>(Symbol)          | Wiring<br>Color         | Terminal<br>Description              | Condition | Specified<br>Condition |
|--------------------------------------|-------------------------|--------------------------------------|-----------|------------------------|
| 2D-32<br>(GND1) -<br>Body<br>ground  | W-B -<br>Body<br>ground | Ground                               | Always    | Below 1<br>ohms        |
| D14-3<br>(GND2) -<br>Body<br>ground  | W-B -<br>Body<br>ground | Ground                               | Always    | Below 1<br>ohms        |
| D13-22<br>(CLTE) -<br>Body<br>ground | LG -<br>Body<br>ground  | Automatic<br>light control<br>ground | Always    | Below 1<br>ohms        |

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

- d. Reconnect the 2A, 2D, 2F, 2K, D13 and D14 instrument panel junction block assembly and main body ECU connectors.

e. Measure the voltage or check for pulses according to the value(s) in the table below.

| Terminal No.<br>(Symbol)          | Wiring Color         | Terminal Description                      | Condition                                     | Specified Condition |
|-----------------------------------|----------------------|-------------------------------------------|-----------------------------------------------|---------------------|
| 2F-13<br>(DRL)*2<br>- Body ground | GR -<br>Body ground  | Daytime running light system drive output | Daytime running light system operates         | Below 1 V           |
|                                   |                      |                                           | Daytime running light system does not operate | 11 to 14 V          |
| 2F-20<br>(DIM) -<br>Body ground   | GR -<br>Body ground  | High beam headlights drive output         | Dimmer switch in high or high flash position  | Below 1 V           |
|                                   |                      |                                           | Dimmer switch in low position                 | 11 to 14 V          |
| 2F-16<br>(PKB) -<br>Body ground   | R-W -<br>Body ground | Parking brake switch input                | Parking brake switch on                       | Below 1 V           |
|                                   |                      |                                           | Parking brake switch off                      | 11 to 14 V          |
| 2F-21<br>(HRLY) -<br>Body ground  | BR -<br>Body ground  | Headlight relay drive output              | Light control switch in head position         | Below 1 V           |
|                                   |                      |                                           | Light control switch not in head position     | 11 to 14 V          |
| 2H-35<br>(FLCY) -<br>Body ground  | P -<br>Body ground   | Front door courtesy light switch LH input | Front door LH open                            | Below 1 V           |
|                                   |                      |                                           | Front door LH closed                          | 11 to 14 V          |
| 2H-27                             |                      | Front door                                | Front door                                    | Below 1             |

|                                      |                        |                                                            |                                                          |                     |
|--------------------------------------|------------------------|------------------------------------------------------------|----------------------------------------------------------|---------------------|
| (FRCY) -<br>Body<br>ground           | GR -<br>Body<br>ground | courtesy<br>light switch<br>RH input                       | RH open                                                  | V                   |
|                                      |                        |                                                            | Front door<br>RH closed                                  | 11 to 14 V          |
| 2H-26<br>(LSWL) -<br>Body<br>ground  | B -<br>Body<br>ground  | Rear door<br>unlock<br>detection<br>switch LH<br>input     | Rear door<br>LH locked                                   | Pulse<br>generation |
|                                      |                        |                                                            | Rear door<br>LH<br>unlocked                              | Below 1<br>V        |
| D12-3<br>(LCTY) -<br>Body<br>ground  | GR -<br>Body<br>ground | Rear door<br>courtesy<br>light switch<br>LH input          | Rear door<br>LH open                                     | Below 1<br>V        |
|                                      |                        |                                                            | Rear door<br>LH closed                                   | Pulse<br>generation |
| D13-5<br>(HU) -<br>Body<br>ground    | P -<br>Body<br>ground  | Dimmer<br>switch high<br>position<br>signal input          | Dimmer<br>switch in<br>high or<br>high flash<br>position | Below 1<br>V        |
|                                      |                        |                                                            | Dimmer<br>switch in<br>low<br>position                   | Pulse<br>generation |
| D13-6<br>(RCTY) -<br>Body<br>ground  | L -<br>Body<br>ground  | Rear door<br>courtesy<br>light switch<br>RH input          | Rear door<br>RH open                                     | Below 1<br>V        |
|                                      |                        |                                                            | Rear door<br>RH closed                                   | Pulse<br>generation |
| D13-7<br>(LSFL) -<br>Body<br>ground  | V -<br>Body<br>ground  | Front door<br>unlock<br>detection<br>switch LH<br>input    | Front door<br>LH locked                                  | Pulse<br>generation |
|                                      |                        |                                                            | Front door<br>LH<br>unlocked                             | Below 1<br>V        |
| D13-8<br>(HF) -<br>Body<br>ground    | SB -<br>Body<br>ground | Dimmer<br>switch high<br>flash<br>position<br>signal input | Dimmer<br>switch in<br>high flash<br>position            | Below 1<br>V        |
|                                      |                        |                                                            | Dimmer<br>switch not<br>in high<br>flash<br>position     | Pulse<br>generation |
| D13-18<br>(LSFR) -<br>Body<br>ground | Y -<br>Body<br>ground  | Front door<br>unlock<br>detection<br>RH switch<br>input    | Front door<br>RH<br>locked                               | Pulse<br>generation |
|                                      |                        |                                                            | Front door<br>RH<br>unlocked                             | Below 1<br>V        |
|                                      |                        |                                                            |                                                          |                     |

|                                      |                        |                                                                   |                                                                                   |                                                  |
|--------------------------------------|------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------|
| D13-19<br>(BCTY) -<br>Body<br>ground | GR -<br>Body<br>ground | Back door<br>courtesy<br>light switch<br>input                    | Back door<br>open                                                                 | Below 1<br>V                                     |
|                                      |                        |                                                                   | Back door<br>closed                                                               | Pulse<br>generation                              |
| D13-20<br>(CLTB) -<br>Body<br>ground | R -<br>Body<br>ground  | Automatic<br>light control<br>sensor<br>power<br>supply<br>output | Ignition<br>switch off                                                            | Below 1<br>V                                     |
|                                      |                        |                                                                   | Ignition<br>switch<br>ON and<br>light<br>control<br>switch in<br>AUTO<br>position | 11 to 14 V                                       |
| D13-21<br>(CLTS) -<br>Body<br>ground | G -<br>Body<br>ground  | Automatic<br>light control<br>sensor<br>signal input              | Ignition<br>switch off                                                            | Below 1<br>V                                     |
|                                      |                        |                                                                   | Automatic<br>light<br>control<br>system<br>operates                               | Pulse<br>generation<br>(See <b>Fig.<br/>16</b> ) |
| D13-27<br>(FFOG) -<br>Body<br>ground | R -<br>Body<br>ground  | Front fog<br>light switch<br>input                                | Front fog<br>light<br>switch on                                                   | Below 1<br>V                                     |
|                                      |                        |                                                                   | Front fog<br>light<br>switch off                                                  | Pulse<br>generation                              |
| D13-28<br>(A) -<br>Body<br>ground    | V -<br>Body<br>ground  | Light<br>control<br>switch<br>AUTO<br>position<br>signal input    | Light<br>control<br>switch in<br>AUTO<br>position                                 | Below 1<br>V                                     |
|                                      |                        |                                                                   | Light<br>control<br>switch not<br>in AUTO<br>position                             | Pulse<br>generation                              |
|                                      |                        | Light                                                             | Light<br>control<br>switch in<br>head<br>position                                 | Below 1<br>V                                     |
|                                      |                        |                                                                   | Light<br>control<br>switch not<br>in head                                         | Pulse                                            |

|                                      |                       |                                                             |                                                                                                              |                     |
|--------------------------------------|-----------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------|
| D13-29<br>(HEAD)<br>- Body<br>ground | R -<br>Body<br>ground | control<br>switch head<br>position<br>input                 | position<br>and<br>ignition<br>switch off                                                                    | generation          |
|                                      |                       |                                                             | Light<br>control<br>switch not<br>in head<br>position<br>and<br>ignition<br>switch<br>ON                     | 11 to 14 V          |
| D13-30<br>(TAIL) -<br>Body<br>ground | Y -<br>Body<br>ground | Light<br>control<br>switch tail<br>position<br>signal input | Light<br>control<br>switch in<br>tail or<br>head<br>position                                                 | Below 1<br>V        |
|                                      |                       |                                                             | Light<br>control<br>switch in<br>neither<br>tail nor<br>head<br>position,<br>and<br>ignition<br>switch off   | Pulse<br>generation |
|                                      |                       |                                                             | Light<br>control<br>switch in<br>neither<br>tail nor<br>head<br>position,<br>and<br>ignition<br>switch<br>ON | 11 to 14 V          |
| D14-2<br>(LSWR)<br>- Body<br>ground  | L -<br>Body<br>ground | Rear door<br>unlock<br>detection<br>switch RH<br>input      | Rear door<br>RH<br>locked                                                                                    | Pulse<br>generation |
|                                      |                       |                                                             | Rear door<br>RH<br>unlocked                                                                                  | Below 1<br>V        |

\*2: w/ Daytime Running Light System

If the result is not as specified, the main body ECU or instrument panel junction block assembly may have a malfunction.

1. Waveform 1

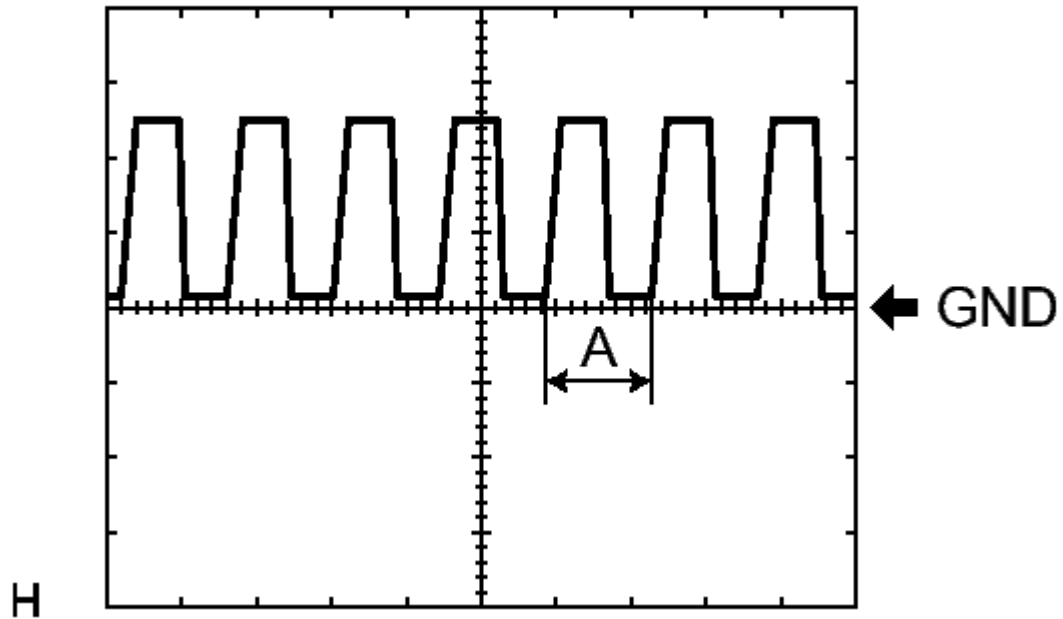


**Fig. 16: Identifying Waveform 1**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

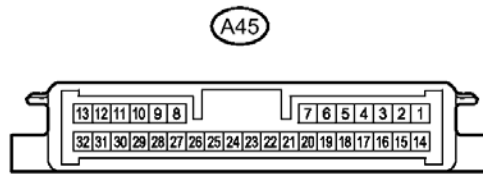
| Item         | Content                       |
|--------------|-------------------------------|
| Tool setting | 5<br>V/DIV.,<br>5<br>ms./DIV. |

**HINT:**

If the ambient light becomes brighter, width A becomes narrower.

**2. CHECK HEADLIGHT SWIVEL ECU ASSEMBLY (w/ HID Headlight System)**

- Disconnect the A45 headlight swivel ECU assembly connector.



H

**Fig. 17: Headlight Swivel ECU Assembly (w/ HID Headlight System) Connector Terminal Identification**

**Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.**

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

| Terminal No.<br>(Symbol)           | Wiring Color            | Terminal Description                          | Condition | Specified Condition |
|------------------------------------|-------------------------|-----------------------------------------------|-----------|---------------------|
| A45-22<br>(E1) -<br>Body<br>ground | W-B -<br>Body<br>ground | Headlight<br>swivel ECU<br>assembly<br>ground | Always    | Below 1<br>ohms     |

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

- c. Measure the voltage according to the value(s) in the table below.

| Terminal No.<br>(Symbol)           | Wiring Color          | Terminal Description                                   | Condition                | Specified Condition |
|------------------------------------|-----------------------|--------------------------------------------------------|--------------------------|---------------------|
| A45-15<br>(IG) -<br>Body<br>ground | G -<br>Body<br>ground | Headlight<br>swivel ECU<br>assembly<br>power<br>supply | Ignition<br>switch off   | Below 1<br>V        |
|                                    |                       |                                                        | Ignition<br>switch<br>ON | 11 to 14 V          |

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

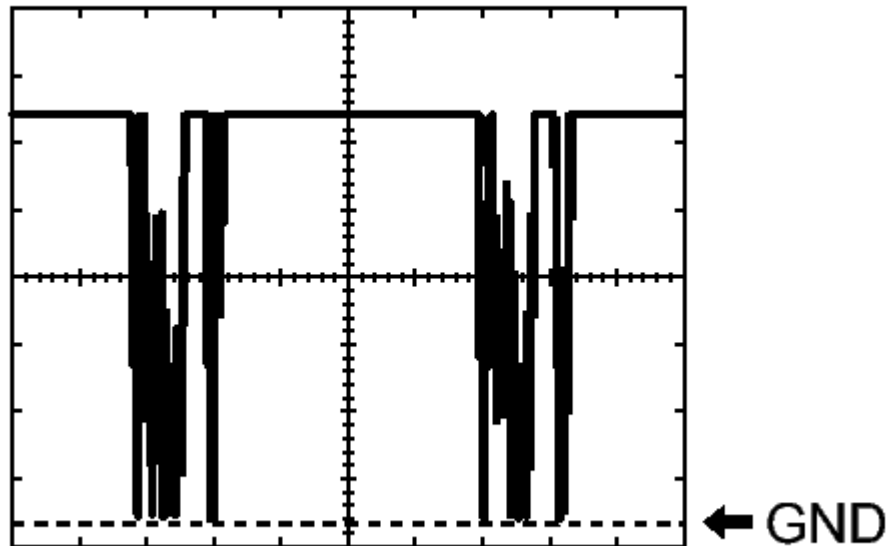
- d. Reconnect the A45 headlight swivel ECU assembly connector.  
e. Measure the voltage according to the value(s) in the table below.

| Terminal No.<br>(Symbol) | Wiring Color | Terminal Description | Condition                           | Specified Condition |
|--------------------------|--------------|----------------------|-------------------------------------|---------------------|
|                          |              |                      | Ignition<br>switch ON,<br>terminals |                     |

|                                      |             |                           |                                                                                   |                                                  |
|--------------------------------------|-------------|---------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------|
| A45-7<br>(INIT) -<br>A45-22<br>(E1)  | W - W-<br>B | Operation<br>check signal | LVL and<br>GND of<br>DLC3<br>connected                                            | Below 1<br>V                                     |
|                                      |             |                           | Ignition<br>switch ON,<br>terminals<br>LVL and<br>GND of<br>DLC3 not<br>connected | Approx. 5<br>V                                   |
| A45-10<br>(SMR) -<br>A45-22<br>(E1)  | V - W-<br>B | LIN<br>communication      | Ignition<br>switch off                                                            | Below 1<br>V                                     |
|                                      |             |                           | Ignition<br>switch ON,<br>inner rear<br>view mirror<br>connector<br>disconnected  | Pulse<br>generation<br>(See <b>Fig.<br/>18</b> ) |
| A45-12<br>(CANH) -<br>A45-22<br>(E1) | G - W-<br>B | CAN<br>communication      | Ignition<br>switch off                                                            | Below 1<br>V                                     |
|                                      |             |                           | Ignition<br>switch ON                                                             | Pulse<br>generation                              |
| A45-13<br>(CANL) -<br>A45-22<br>(E1) | W - W-<br>B | CAN<br>communication      | Ignition<br>switch off                                                            | Below 1<br>V                                     |
|                                      |             |                           | Ignition<br>switch ON                                                             | Pulse<br>generation                              |

If the result is not as specified, the headlight swivel ECU assembly may have a malfunction.

#### 1. Waveform 1

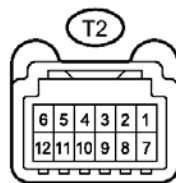


H

**Fig. 18: Identifying Waveform 1**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

| Item         | Content                        |
|--------------|--------------------------------|
| Tool setting | 2<br>V/DIV.,<br>20<br>ms./DIV. |

3. **CHECK INNER REAR VIEW MIRROR ASSEMBLY (w/ HID Headlight System)**
  - a. Disconnect the T2 inner rear view mirror assembly connector.



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**Fig. 19: Inner Rear View Mirror Assembly (w/ HID Headlight System) Connector Terminal Identification**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|--|--|--|--|--|

| Terminal No.<br>(Symbol)  | Wiring Color         | Terminal Description                   | Condition | Specified Condition |
|---------------------------|----------------------|----------------------------------------|-----------|---------------------|
| T2-3 (E)<br>- Body ground | W-B -<br>Body ground | Inner rear view mirror assembly ground | Always    | Below 1 ohms        |

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

- c. Measure the voltage according to the value(s) in the table below.

| Terminal No.<br>(Symbol)   | Wiring Color       | Terminal Description                         | Condition           | Specified Condition |
|----------------------------|--------------------|----------------------------------------------|---------------------|---------------------|
| T2-6 (IG)<br>- Body ground | L -<br>Body ground | Inner rear view mirror assembly power supply | Ignition switch off | Below 1 V           |
|                            |                    |                                              | Ignition switch ON  | 11 to 14 V          |

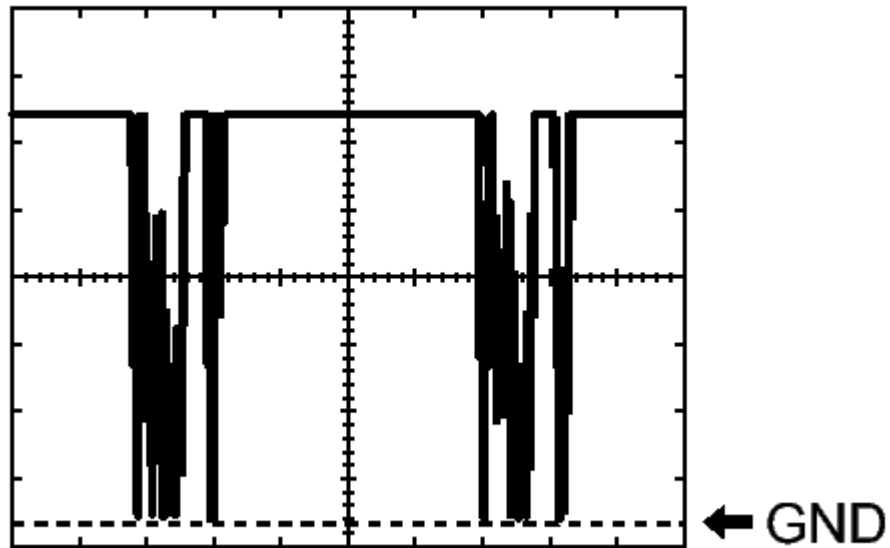
If the result is not as specified, there may be a malfunction in the wire harness.

- d. Reconnect the T2 inner rear view mirror assembly connector.  
e. Measure the voltage or check for pulses according to the value(s) in the table below.

| Terminal No.<br>(Symbol)  | Wiring Color | Terminal Description | Condition                           | Specified Condition                    |
|---------------------------|--------------|----------------------|-------------------------------------|----------------------------------------|
| T2-12 (LIN) -<br>T2-3 (E) | V - W-B      | LIN communication    | Ignition switch off                 | Below 1 V                              |
|                           |              |                      | Automatic high beam system operates | Pulse generation (See <b>Fig. 20</b> ) |

If the result is not as specified, the inner rear view mirror assembly may have a malfunction.

1. Waveform 1



H

**Fig. 20: Identifying Waveform 1**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

| Item         | Content                        |
|--------------|--------------------------------|
| Tool setting | 2<br>V/DIV.,<br>20<br>ms./DIV. |

## DIAGNOSIS SYSTEM

### DIAGNOSIS SYSTEM

#### 1. DESCRIPTION

- Lighting system data and the Diagnostic Trouble Codes (DTCs) can be read from the Data Link Connector 3 (DLC3) of the vehicle. When the system seems to be malfunctioning, use the Techstream to check for malfunctions and to repair.

#### 2. CHECK DLC3

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

#### 3. INSPECT BATTERY VOLTAGE

Standard voltage

11 to 14 V

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

## **DTC CHECK / CLEAR**

### **DTC CHECK / CLEAR**

#### **1. CHECK DTC**

- 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 / Trouble Codes.
- e. Check for DTCs.

#### **2. CLEAR DTC**

- 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 / Trouble Codes.
- e. Clear the DTCs.

## **FREEZE FRAME DATA**

### **FREEZE FRAME DATA**

#### **1. FREEZE FRAME DATA**

- a. Whenever a DTC is detected, the headlight swivel ECU assembly stores the current vehicle (sensor) state as Freeze Frame Data.

#### **2. CHECK FREEZE FRAME DATA**

- 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 / AFS / Trouble Codes.
- e. According to the display on the Techstream, select the trouble code data display with Freeze Frame Data.

#### **AFS**

| <b>Tester Display</b> | <b>Measurement Item/Range</b>              | <b>Normal Condition</b>   | <b>Diagnostic Note</b> |
|-----------------------|--------------------------------------------|---------------------------|------------------------|
| +B                    | IG power supply voltage value/0 to 19.75 V | 11 to 14 V                | -                      |
| Steering Sens         | Steering angle sensor signal value/-384    | Value is output according | -                      |

|                          |                                                                 |                                                  |   |
|--------------------------|-----------------------------------------------------------------|--------------------------------------------------|---|
| Signal                   | deg. to 382.5 deg.                                              | to steering wheel position                       |   |
| Steering Sens Center Pos | Steering angle sensor center position/-3072 deg. to 3070.5 deg. | Approx. 0 deg. (When steering wheel is straight) | - |
| FR Wheel Speed           | Front right wheel speed/0 to 327.67 km/h                        | Condition can be displayed                       | - |

### 3. CLEAR FREEZE FRAME DATA

**NOTE:** Clearing the DTC will also clear the Freeze Frame Data.

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Clear the DTC and Freeze Frame Data. Refer to **DTC CHECK / CLEAR**.

## FAIL-SAFE CHART

### FAIL-SAFE CHART

#### 1. HID Headlight System

The light control ECU performs the following fail-safe operations when there are abnormalities in the output voltage, input voltage or light voltage.

| Item                                                       | Outline                                                                                                                                                   |
|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Detection of abnormal output voltage (Short, open or leak) | When an abnormality in output voltage is generated, headlight lighting is cancelled and remains turned off until power is turned on again (by turning the |

|                                     |                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | light control switch from off to head position).                                                                                                                                                                                                                                                                                                     |
| Detection of abnormal input voltage | When input voltage is outside the operation range (10 to 16 V), headlight lighting is cancelled and the headlight gradually comes on again as input returns to operation voltage range. However, if the input voltage drops after lighting comes on, lighting will be maintained until voltage drops below lighting maintenance limit voltage (6 V). |
| Detection of abnormal               | When a light voltage abnormality is detected, headlight lighting will be cancelled and remains turned off                                                                                                                                                                                                                                            |

|               |                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------|
| light voltage | until power is turned on again (by turning the light control switch from off to head position). |
|---------------|-------------------------------------------------------------------------------------------------|

## 2. Automatic Light Control System

If the main body ECU detects a malfunction in the automatic light control sensor, the main body ECU effects fail-safe control to prohibit the automatic light control. If the low beam headlights and taillights are on, the lights will remain on until the light control switch is turned off.

## 3. Automatic High Beam System

- a. The main body ECU operates in the fail-safe mode if an abnormal condition such as those listed below has been detected.

| Item                                     | Abnormality Detection Condition                              | Return Condition                                                                              | Warning indicator |
|------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------|
| Steering Angle Sensor Signal Malfunction | Steering angle sensor malfunction is detected.               | Steering angle sensor malfunction is not detected, and ignition switch is turned to ON again. | Flash             |
|                                          | Steering angle sensor zero point memory invalid is detected. | Steering angle sensor zero point memory valid is detected.                                    | Not illuminated   |
|                                          | Steering angle sensor data continuity invalid is detected.   | Steering angle sensor data continuity invalid flag is detected.                               | Not illuminated   |
| Speed Sensor Signal Malfunction          | Abnormal speed sensor signal is detected.                    | Normal speed sensor signal is detected.                                                       | Flash             |
| CAN                                      | Normal CAN communication                                     | Normal CAN                                                                                    |                   |

|                                        |                                                                            |                                                   |       |
|----------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------|-------|
| Communication<br>Signal<br>Malfunction | signal is not<br>detected for<br>more than 10<br>seconds<br>consecutively. | communication<br>signal is<br>detected.           | Flash |
| Automatic<br>High Beam<br>Sensor       | Communication<br>stopped for 10<br>seconds<br>consecutively.               | Normal<br>communication<br>signal is<br>detected. | Flash |

## 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, actuator 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.

**WARNING:** 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.

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / (desired system) / Data List.
- Read the Data List according to the display on the Techstream.

#### MAIN BODY

| Tester<br>Display | Measurement<br>Item/Range                                     | Normal<br>Condition                                                      | Diagnostic<br>Note |
|-------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|--------------------|
| IG SW             | Ignition switch<br>or engine switch<br>IG signal/ON or<br>OFF | ON:<br>Ignition<br>switch ON<br>OFF:<br>Ignition<br>switch off<br>or ACC | -                  |
|                   |                                                               | ON:<br>Parking                                                           |                    |

|                       |                                                               |                                                                             |   |
|-----------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------|---|
| Parking Brake SW      | Parking brake switch signal/ON or OFF                         | brake switch on<br>OFF: Parking brake switch off                            | - |
| RR Door Courtesy SW   | Rear door courtesy switch RH/ON or OFF                        | ON: Rear door RH open<br>OFF: Rear door RH closed                           | - |
| RL Door Courtesy SW   | Rear door courtesy switch LH/ON or OFF                        | ON: Rear door LH open<br>OFF: Rear door LH closed                           | - |
| Back Door Courtesy SW | Back door courtesy switch/ON or OFF                           | ON: Back door open<br>OFF: Back door closed                                 | - |
| FR Door Lock Pos      | Front RH side door lock position switch signal/UNLOCK or LOCK | UNLOCK: Front RH side door unlocked<br>LOCK: Front RH side door locked      | - |
| FR Door Courtesy      | Front passenger side door courtesy switch/ON or OFF           | ON: Front passenger side door closed<br>OFF: Front passenger side door open | - |
| FL Door Lock Pos      | Front LH side door lock position switch signal/UNLOCK or LOCK | UNLOCK: Front LH side door unlocked<br>LOCK: Front LH side door             | - |

|                     |                                                           |                                                                                               |   |
|---------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------|---|
|                     |                                                           | locked                                                                                        |   |
| FL Door Courtesy    | Driver side door courtesy switch signal/ON or OFF         | ON: Driver side door closed<br>OFF: Driver side door open                                     | - |
| RR-Door Lock Pos SW | Rear RH side door lock position switch signal/ON or OFF   | ON: Rear RH side rear door unlocked<br>OFF: Rear RH side rear door locked                     | - |
| RL-Door Lock Pos SW | Rear LH side door lock position switch signal/ON or OFF   | ON: Rear LH side rear door unlocked<br>OFF: Rear LH side rear door locked                     | - |
| Dimmer SW           | Dimmer switch high position signal/ON or OFF              | ON: Dimmer switch in high or high flash (pass) position<br>OFF: Dimmer switch in low position | - |
| Passing Light SW    | Dimmer switch high flash (pass) position signal/ON or OFF | ON: Dimmer switch in high flash (pass) position<br>OFF: Dimmer switch not in high             | - |

|                         |                                                                 |                                                                                                                                                   |   |
|-------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                         |                                                                 | flash<br>(pass)<br>position                                                                                                                       |   |
| Front Fog<br>Light SW   | Front fog light<br>switch<br>signal/ON or<br>OFF                | ON: Front<br>fog light<br>switch on<br>OFF:<br>Front fog<br>light<br>switch off                                                                   | - |
| Auto Light<br>SW        | Light control<br>switch AUTO<br>position<br>signal/ON or<br>OFF | ON: Light<br>control<br>switch in<br>AUTO<br>position<br>OFF:<br>Light<br>control<br>switch not<br>in AUTO<br>position                            | - |
| Head Light<br>SW (Head) | Light control<br>switch head<br>position<br>signal/ON or<br>OFF | ON: Light<br>control<br>switch in<br>head<br>position<br>OFF:<br>Light<br>control<br>switch not<br>in head<br>position                            | - |
| Head Light<br>SW (Tail) | Light control<br>switch tail<br>position<br>signal/ON or<br>OFF | ON: Light<br>control<br>switch in<br>tail or<br>head<br>position<br>OFF:<br>Light<br>control<br>switch in<br>neither tail<br>nor head<br>position | - |
| Illumination            | Illumination rate                                               | Value is<br>output                                                                                                                                |   |

| Rate Info           | information                                                                                                                                                                                         | according<br>to ambient<br>light levels | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Auto H<br>Beam STS0 | Automatic high<br>beam sensor<br>current<br>state/Undetec,<br>CAM NA, No<br>sens, Hlight,<br>Taillgt, Speed,<br>Daytime,<br>Village,<br>Malfunc, Delay,<br>Aim Lmt, SAE<br>Mod, Undefin,<br>LIN Err | Condition<br>can be<br>displayed        | Undetec:<br>undetected<br>CAM NA:<br>camera<br>detection<br>malfunction<br>No sens: no<br>detection<br>Hlight:<br>oncoming<br>vehicles with<br>headlights on<br>Taillgt:<br>preceding<br>vehicles with<br>taillights on<br>Speed: vehicle<br>speed<br>Daytime:<br>daytime state<br>Village: urban<br>area<br>Malfunc:<br>malfunction<br>Delay: standby<br>mode<br>Aim Lmt:<br>aiming<br>misalignment<br>SAE Mod:<br>SAE mode<br>Undefin:<br>undefined state<br>LIN Err: LIN<br>communication<br>error |
|                     |                                                                                                                                                                                                     |                                         | Undetec:<br>undetected<br>CAM NA:<br>camera<br>detection<br>malfunction<br>No sens: no<br>detection<br>Hlight:                                                                                                                                                                                                                                                                                                                                                                                        |

|                     |                                                                                                                                                                                                    |                                  |                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Auto H<br>Beam STS1 | Automatic high<br>beam sensor<br>state past<br>1/Undetec,<br>CAM NA, No<br>sens, Hlight,<br>Taillgt, Speed,<br>Daytime,<br>Village,<br>Malfunc, Delay,<br>Aim Lmt, SAE<br>Mod, Undefin,<br>LIN Err | Condition<br>can be<br>displayed | oncoming<br>vehicles with<br>headlights on<br>Taillgt:<br>preceding<br>vehicles with<br>taillights on<br>Speed: vehicle<br>speed<br>Daytime:<br>daytime state<br>Village: urban<br>area<br>Malfunc:<br>malfunction<br>Delay: standby<br>mode<br>Aim Lmt:<br>aiming<br>misalignment<br>SAE Mod:<br>SAE mode<br>Undefin:<br>undefined state<br>LIN Err: LIN<br>communication<br>error |
| Auto H<br>Beam STS2 | Automatic high<br>beam sensor<br>state past<br>2/Undetec,<br>CAM NA, No<br>sens, Hlight,<br>Taillgt, Speed,<br>Daytime,<br>Village,                                                                | Condition<br>can be<br>displayed | Undetec:<br>undetected<br>CAM NA:<br>camera<br>detection<br>malfunction<br>No sens: no<br>detection<br>Hlight:<br>oncoming<br>vehicles with<br>headlights on<br>Taillgt:<br>preceding<br>vehicles with<br>taillights on<br>Speed: vehicle<br>speed<br>Daytime:<br>daytime state<br>Village: urban                                                                                   |

|                     |                                                                                                                                                                                                    |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | Malfunc, Delay,<br>Aim Lmt, SAE<br>Mod, Undefin,<br>LIN Err                                                                                                                                        |                                  | area<br>Malfunc:<br>malfunction<br>Delay: standby<br>mode<br>Aim Lmt:<br>aiming<br>misalignment<br>SAE Mod:<br>SAE mode<br>Undefin:<br>undefined state<br>LIN Err: LIN<br>communication<br>error                                                                                                                                                                                                                                                            |
| Auto H<br>Beam STS3 | Automatic high<br>beam sensor<br>state past<br>3/Undetec,<br>CAM NA, No<br>sens, Hlight,<br>Taillgt, Speed,<br>Daytime,<br>Village,<br>Malfunc, Delay,<br>Aim Lmt, SAE<br>Mod, Undefin,<br>LIN Err | Condition<br>can be<br>displayed | Undetec:<br>undetected<br>CAM NA:<br>camera<br>detection<br>malfunction<br>No sens: no<br>detection<br>Hlight:<br>oncoming<br>vehicles with<br>headlights on<br>Taillgt:<br>preceding<br>vehicles with<br>taillights on<br>Speed: vehicle<br>speed<br>Daytime:<br>daytime state<br>Village: urban<br>area<br>Malfunc:<br>malfunction<br>Delay: standby<br>mode<br>Aim Lmt:<br>aiming<br>misalignment<br>SAE Mod:<br>SAE mode<br>Undefin:<br>undefined state |

|                  |                                                                                                                                                                |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                                                                                                                                                                |                            | LIN Err: LIN communication error                                                                                                                                                                                                                                                                                                                                                                                                    |
| Auto H Beam STS4 | Automatic high beam sensor state past 4/Undetec, CAM NA, No sens, Hlight, Taillgt, Speed, Daytime, Village, Malfunc, Delay, Aim Lmt, SAE Mod, Undefin, LIN Err | Condition can be displayed | Undetec: undetected<br>CAM NA: camera detection malfunction<br>No sens: no detection<br>Hlight: oncoming vehicles with headlights on<br>Taillgt: preceding vehicles with taillights on<br>Speed: vehicle speed<br>Daytime: daytime state<br>Village: urban area<br>Malfunc: malfunction<br>Delay: standby mode<br>Aim Lmt: aiming misalignment<br>SAE Mod: SAE mode<br>Undefin: undefined state<br>LIN Err: LIN communication error |
|                  |                                                                                                                                                                |                            | Undetec: undetected<br>CAM NA: camera detection malfunction<br>No sens: no detection<br>Hlight:                                                                                                                                                                                                                                                                                                                                     |

|                     |                                                                                                                                                                                                    |                                  |                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Auto H<br>Beam STS5 | Automatic high<br>beam sensor<br>state past<br>5/Undetec,<br>CAM NA, No<br>sens, Hlight,<br>Taillgt, Speed,<br>Daytime,<br>Village,<br>Malfunc, Delay,<br>Aim Lmt, SAE<br>Mod, Undefin,<br>LIN Err | Condition<br>can be<br>displayed | oncoming<br>vehicles with<br>headlights on<br>Taillgt:<br>preceding<br>vehicles with<br>taillights on<br>Speed: vehicle<br>speed<br>Daytime:<br>daytime state<br>Village: urban<br>area<br>Malfunc:<br>malfunction<br>Delay: standby<br>mode<br>Aim Lmt:<br>aiming<br>misalignment<br>SAE Mod:<br>SAE mode<br>Undefin:<br>undefined state<br>LIN Err: LIN<br>communication<br>error |
| Auto H<br>Beam STS6 | Automatic high<br>beam sensor<br>state past<br>6/Undetec,<br>CAM NA, No<br>sens, Hlight,<br>Taillgt, Speed,<br>Daytime,<br>Village,                                                                | Condition<br>can be<br>displayed | Undetec:<br>undetected<br>CAM NA:<br>camera<br>detection<br>malfunction<br>No sens: no<br>detection<br>Hlight:<br>oncoming<br>vehicles with<br>headlights on<br>Taillgt:<br>preceding<br>vehicles with<br>taillights on<br>Speed: vehicle<br>speed<br>Daytime:<br>daytime state<br>Village: urban                                                                                   |

|                     |                                                                                                                                                                                                    |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | Malfunc, Delay,<br>Aim Lmt, SAE<br>Mod, Undefin,<br>LIN Err                                                                                                                                        |                                  | area<br>Malfunc:<br>malfunction<br>Delay: standby<br>mode<br>Aim Lmt:<br>aiming<br>misalignment<br>SAE Mod:<br>SAE mode<br>Undefin:<br>undefined state<br>LIN Err: LIN<br>communication<br>error                                                                                                                                                                                                                                                            |
| Auto H<br>Beam STS7 | Automatic high<br>beam sensor<br>state past<br>7/Undetec,<br>CAM NA, No<br>sens, Hlight,<br>Taillgt, Speed,<br>Daytime,<br>Village,<br>Malfunc, Delay,<br>Aim Lmt, SAE<br>Mod, Undefin,<br>LIN Err | Condition<br>can be<br>displayed | Undetec:<br>undetected<br>CAM NA:<br>camera<br>detection<br>malfunction<br>No sens: no<br>detection<br>Hlight:<br>oncoming<br>vehicles with<br>headlights on<br>Taillgt:<br>preceding<br>vehicles with<br>taillights on<br>Speed: vehicle<br>speed<br>Daytime:<br>daytime state<br>Village: urban<br>area<br>Malfunc:<br>malfunction<br>Delay: standby<br>mode<br>Aim Lmt:<br>aiming<br>misalignment<br>SAE Mod:<br>SAE mode<br>Undefin:<br>undefined state |

|  |  |  |                                  |
|--|--|--|----------------------------------|
|  |  |  | LIN Err: LIN communication error |
|--|--|--|----------------------------------|

#### AFS

| Tester Display           | Measurement Item/Range                                          | Normal Condition                                     | Diagnostic Note |
|--------------------------|-----------------------------------------------------------------|------------------------------------------------------|-----------------|
| Steering Sens Signal     | Steering angle sensor signal value/-384 deg. to 382.5 deg.      | Value is output according to steering wheel position | -               |
| Steering Sens Center Pos | Steering angle sensor center position/-3072 deg. to 3070.5 deg. | Approx. 0 deg. (When steering wheel is straight)     | -               |
| FR Wheel Speed           | Front right wheel speed/0 to 327.67 km/h                        | Condition can be displayed                           | -               |
| Number Of Trouble Codes  | Number of trouble codes/0 to 255                                | Condition can be displayed                           | -               |

## 2. ACTIVE TEST

### HINT:

Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / (desired system) / Active Test.
- Perform the Active Test according to the display on the Techstream.

#### MAIN BODY

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|

| Tester Display        | Test Part                   | Control Range | Diagnostic Note                                        |
|-----------------------|-----------------------------|---------------|--------------------------------------------------------|
| Daytime Running Light | Daytime running light relay | ON/OFF -      |                                                        |
| Taillight Relay       | Taillight relay             | ON/OFF -      |                                                        |
| Headlight Relay       | Low beam headlight relay    | ON/OFF -      |                                                        |
| Head Light Hi         | High beam headlight relay   | ON/OFF -      |                                                        |
| Front Fog Light Relay | Front fog light relay       | ON/OFF        | This test is possible when the taillight switch is ON. |

#### MIRROR L

| Tester Display | Test Part                 | Control Range | Diagnostic Note |
|----------------|---------------------------|---------------|-----------------|
| Foot Light     | Door mirror foot light LH | ON/OFF -      |                 |

#### MIRROR R

| Tester Display | Test Part                 | Control Range | Diagnostic Note |
|----------------|---------------------------|---------------|-----------------|
| Foot Light     | Door mirror foot light RH | ON/OFF -      |                 |

#### DIAGNOSTIC TROUBLE CODE CHART

#### DIAGNOSTIC TROUBLE CODE CHART

#### LIGHTING SYSTEM

| <b>DTC Code</b> | <b>Detection Item</b>                                | <b>Trouble Area</b>                                                                                                                            | <b>See</b>                                                                                                                                                                                                                                                                        |
|-----------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B1244           | Light Sensor Circuit Malfunction                     | <ul style="list-style-type: none"> <li>- Automatic light control sensor</li> <li>- Harness or connector</li> <li>- Main body ECU</li> </ul>    | Refer to <b><u>DTC B1244: Light Sensor Circuit Malfunction</u></b>                                                                                                                                                                                                                |
| B124A           | Automatic High Beam Mirror                           | <ul style="list-style-type: none"> <li>- Inner rear view mirror assembly</li> </ul>                                                            | Refer to <b><u>DTC B124A: Automatic High Beam Mirror</u></b>                                                                                                                                                                                                                      |
| B124B           | Automatic High Beam System                           | <ul style="list-style-type: none"> <li>- Steering angle sensor, VSC system or SFI system</li> <li>- Inner rear view mirror assembly</li> </ul> | Refer to <b><u>DTC B124B: Automatic High Beam System</u></b>                                                                                                                                                                                                                      |
| B124C           | Automatic High Beam Camera                           | <ul style="list-style-type: none"> <li>- Inner rear view mirror assembly</li> </ul>                                                            | Refer to <b><u>DTC B124C: Automatic High Beam Camera</u></b>                                                                                                                                                                                                                      |
| B2414           | Steering Position Sensor Malfunction                 | <ul style="list-style-type: none"> <li>- Steering angle sensor</li> <li>- Headlight swivel ECU assembly</li> </ul>                             | Refer to <b><u>DTC B2414: Steering Position Sensor Malfunction</u></b>                                                                                                                                                                                                            |
| B2415           | Vehicle Speed Sensor Malfunction                     | <ul style="list-style-type: none"> <li>- Skid control ECU</li> <li>- Headlight swivel ECU assembly</li> </ul>                                  | Refer to <b><u>DTC B2415: Vehicle Speed Sensor Malfunction</u></b>                                                                                                                                                                                                                |
| U0101           | Lost Communication with ECM                          | <ul style="list-style-type: none"> <li>- CAN communication system</li> </ul>                                                                   | Refer to <b><u>DTC U0101: Lost Communication with ECM; DTC U0126: Lost Communication with Steering Angle Sensor Module; DTC U0129: Lost Communication with Skid Control ECU; DTC U0142: Lost Communication with Main Body ECU; DTC U0182: Lost Communication with AFS ECU</u></b> |
| U0126           | Lost Communication with Steering Angle Sensor Module | <ul style="list-style-type: none"> <li>- CAN communication system</li> </ul>                                                                   | Refer to <b><u>DTC U0101: Lost Communication with ECM; DTC U0126: Lost Communication with Steering Angle Sensor Module; DTC U0129: Lost Communication with Skid Control ECU; DTC U0142: Lost Communication with Main Body ECU; DTC U0182: Lost Communication with AFS ECU</u></b> |
|                 |                                                      |                                                                                                                                                | Refer to <b><u>DTC U0101: Lost</u></b>                                                                                                                                                                                                                                            |

|       |                                          |                            |                                                                                                                                                                                                                                                                                                                                                       |
|-------|------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| U0129 | Lost Communication with Skid Control ECU | - CAN communication system | <b><u>Communication with ECM;</u></b><br><b><u>DTC U0126: Lost Communication with Steering Angle Sensor Module;</u></b><br><b><u>DTC U0129: Lost Communication with Skid Control ECU;</u></b><br><b><u>DTC U0142: Lost Communication with Main Body ECU;</u></b><br><b><u>DTC U0182: Lost Communication with AFS ECU</u></b>                          |
| U0142 | Lost Communication with Main Body ECU    | - CAN communication system | Refer to <b><u>DTC U0101: Lost Communication with ECM;</u></b><br><b><u>DTC U0126: Lost Communication with Steering Angle Sensor Module;</u></b><br><b><u>DTC U0129: Lost Communication with Skid Control ECU;</u></b><br><b><u>DTC U0142: Lost Communication with Main Body ECU;</u></b><br><b><u>DTC U0182: Lost Communication with AFS ECU</u></b> |
| U0182 | Lost Communication with AFS ECU          | - CAN communication system | Refer to <b><u>DTC U0101: Lost Communication with ECM;</u></b><br><b><u>DTC U0126: Lost Communication with Steering Angle Sensor Module;</u></b><br><b><u>DTC U0129: Lost Communication with Skid Control ECU;</u></b><br><b><u>DTC U0142: Lost Communication with Main Body ECU;</u></b><br><b><u>DTC U0182: Lost Communication with AFS ECU</u></b> |