■AUTOMATIC HEADLIGHT BEAM LEVEL CONTROL SYSTEM

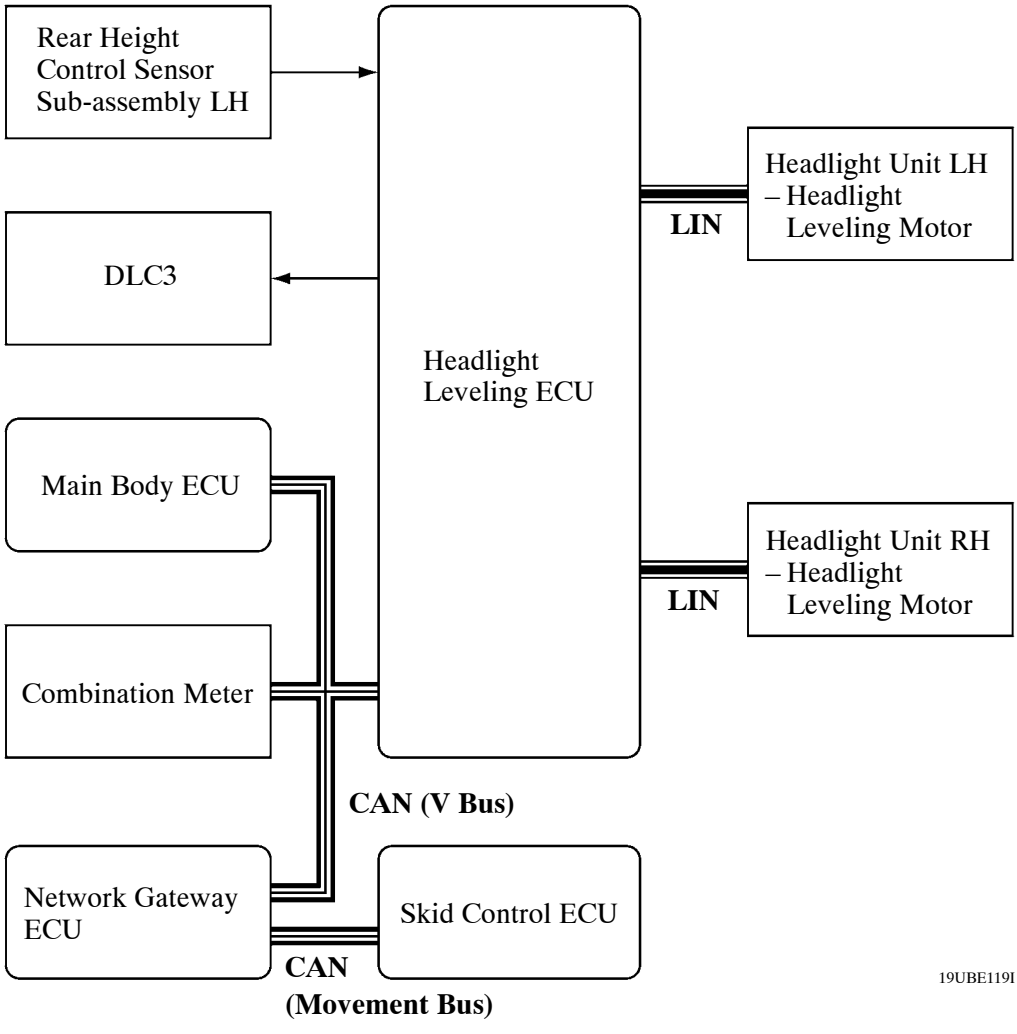
1. General

- The automatic headlight beam level control system is available for models with discharge headlight.
- When the headlights are on, the dynamic automatic headlight beam level control system*1 or static automatic headlight beam level control system*2 operate the headlight level actuators in accordance with movement of the vehicle.

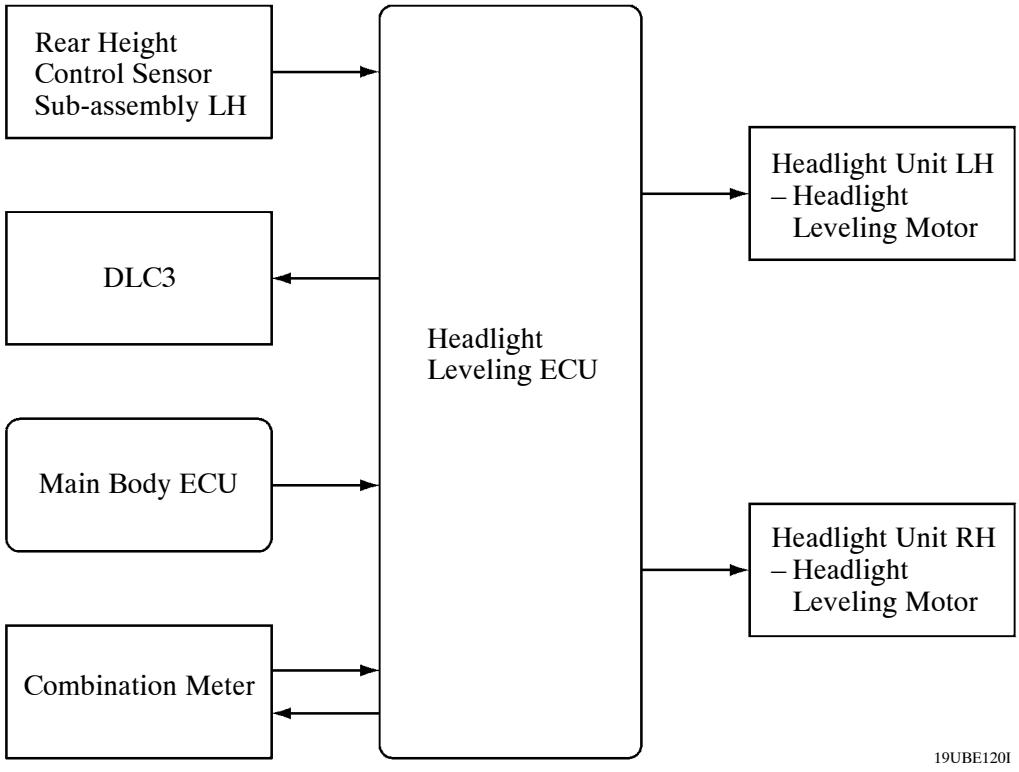
*1: Models with dynamic automatic headlight beam level control system
*2: Models with static automatic headlight beam level control system

▶ System Diagram ◀

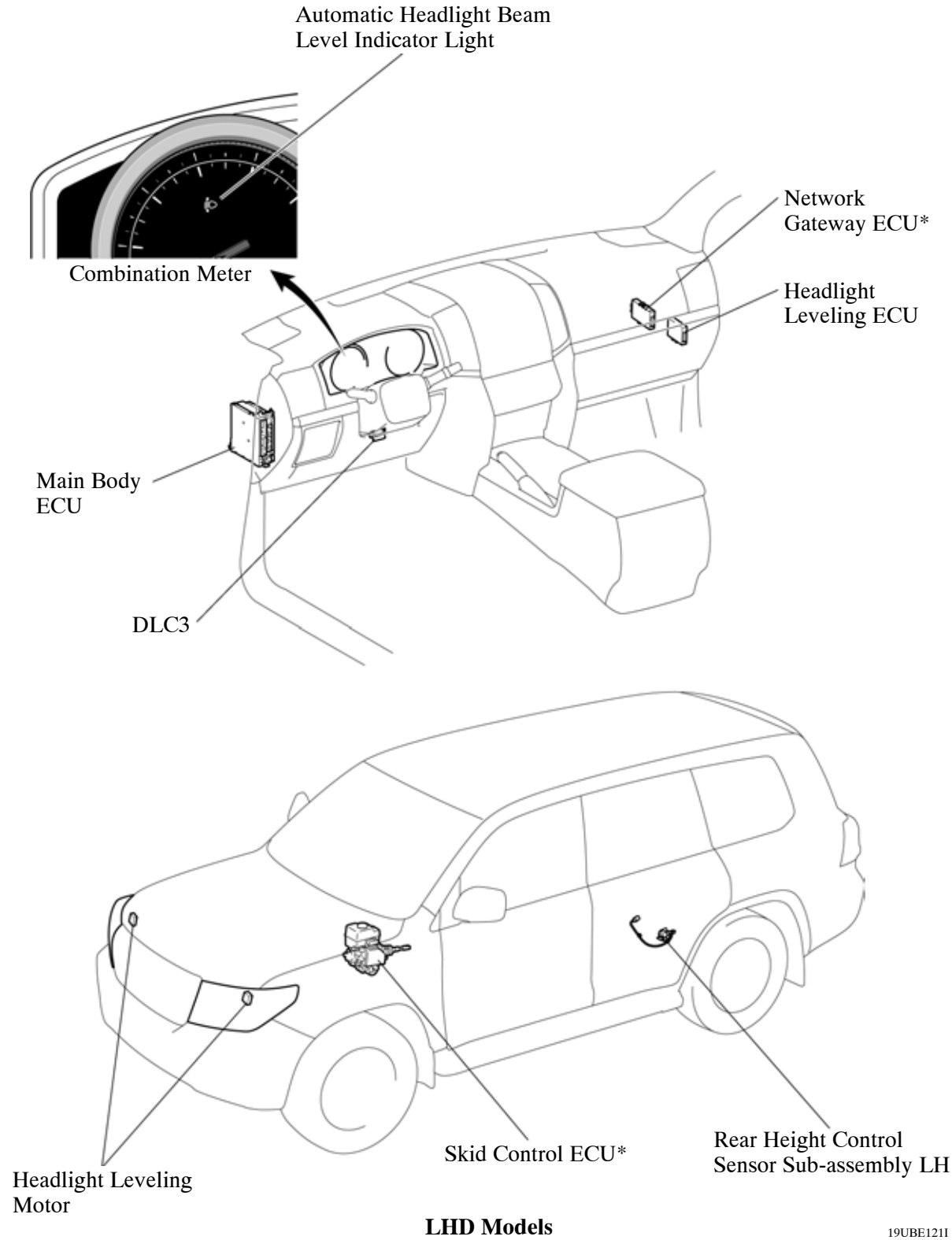
Models with Dynamic Automatic Headlight Beam Level Control System



Models with Static Automatic Headlight Beam Level Control System



2. Layout of Main Components



LHD Models

*: Models with dynamic automatic headlight beam level control system

3. Function of Main Components

Component	Outline
Headlight Leveling ECU	● The headlight leveling ECU detects changes of vehicle movement based on the rear height control sensor sub-assembly LH and vehicle speed signal. ● The headlight leveling ECU outputs control signals to the headlight leveling motors based on the detected value. ● This ECU provides initial set control and a fail-safe function.
Headlight Leveling Motor	● Based on the signals received from headlight leveling ECU, each headlight leveling motor moves the projector unit in the headlight to vary its angle. ● Each headlight leveling motor uses a stepper motor to precisely regulate the angle of the projector unit.
Rear Height Control Sensor Sub-assembly LH	The rear height control sensor sub-assembly LH detects vehicle movement and transmits a signal to the headlight leveling ECU.
Main Body ECU	The main body ECU receives a HEAD position signal from the light control switch and transmits it to the headlight leveling ECU.
Skid Control ECU*1	The skid control ECU transmits a vehicle speed signal to the headlight leveling ECU.
Combination Meter	● The combination meter assembly transmits a vehicle speed signal to the headlight leveling ECU.*2 ● The automatic headlight beam level indicator light flashes to inform the driver when the headlight leveling ECU detects malfunctions in this system.

*1: Models with dynamic automatic headlight beam level control system
*2: Models with static automatic headlight beam level control system

4. Function

- The automatic headlight beam level control system mainly consists of the headlight leveling ECU, rear height control sensor sub-assembly LH and 2 headlight leveling motors. The headlight leveling ECU controls the system.
- The ECU detects the movement of the suspension from the rear height control sensor assembly LH and the vehicle speed from the skid control ECU*1 or combination meter assembly*2.
- The ECU then controls the headlight leveling motor based on this information, in order to change the headlight reflector angle.
- When the headlight leveling ECU assembly detects that the vehicle is stopped and the ignition switch is on (IG), the ECU executes the initial setting of the stepper motors.

*1: Models with dynamic automatic headlight beam level control system
*2: Models with static automatic headlight beam level control system

5. Fail-safe

If the headlight leveling ECU detects a malfunction in the automatic headlight beam level control system, it will take the actions indicated in the table below:

Trouble Area		Condition (Fail-safe Control for Automatic Headlight Beam Level Control)
Headlight Leveling ECU		Stops at current condition.
Vehicle Speed Signal		Continues control only when the vehicle is stopped.
Rear Height Control Sensor Sub-assembly Signal	Models without AVS	● Stops control after returning to initial position (if failure occurs at higher than initial position). ● Stops control at current condition (if failure occurs at lower than initial position).
	Models with AVS	● Stops control after returning to initial position (if failure occurs at more than 0.2% higher than initial position). ● Stops control when the height is more than 0.2% higher than the current position (if failure occurs at less than 0.2% higher than initial position).
Headlight Leveling Motor		● Stops control after returning to initial position (if failure occurs at higher than initial position). ● Stops control at current condition (if failure occurs at lower than initial position).

6. Diagnosis

- When the headlight leveling ECU detects malfunctions in the automatic headlight beam level control system, Diagnostic Trouble Codes (DTCs) are stored in memory.
- The DTCs can be read using the intelligent tester II. For details, refer to the Repair Manual.