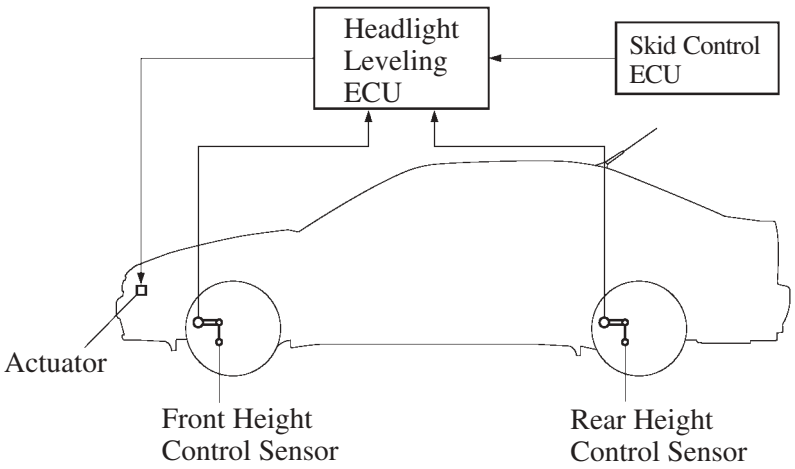
■AUTOMATIC HEADLIGHT BEAM LEVEL CONTROL SYSTEM

1. General

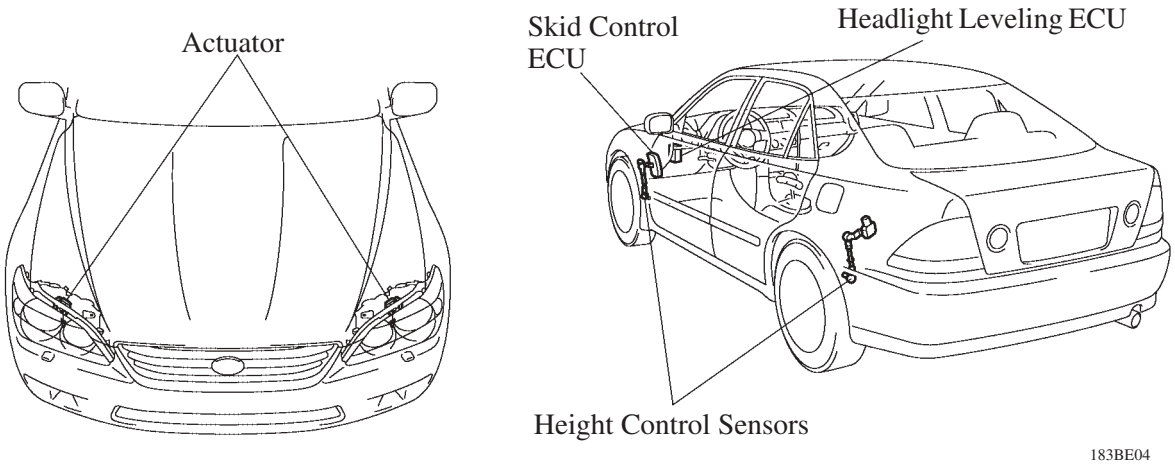
- The automatic headlight beam level control system regulates the orientation of the reflectors of the headlights in relation to the posture of the vehicle that has been detected by sensors. Thus, it is a system that maintains the headlight beams to a constant level while the vehicle is being driven.
- This system is standard equipment on the IS300/IS300 SportCross models, and optional equipment on the IS200.

▶ System Diagram ◀



IS300/200

▶ Layout of Components ◀



IS300/200

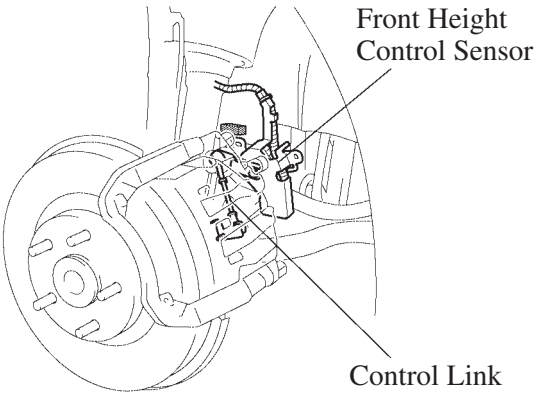
2. Construction

Headlight Leveling ECU

Based on the signals that are transmitted by the height control sensor and the Skid Control ECU, this ECU detects the amount of variance of the vehicle posture. Based on the detected value, this ECU outputs control signals to the actuators.

Height Control Sensor

The height control sensors detect the amount of variance of the vehicle height while the vehicle is being driven, and output this amount in the form of signals to the headlight leveling ECU.
Both of these sensors are located in the left side suspension, one in the front suspension, and the other in the rear suspension.



Front

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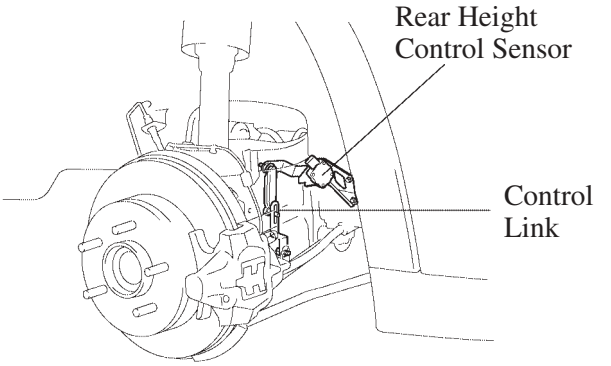

Rear

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Skid Control ECU

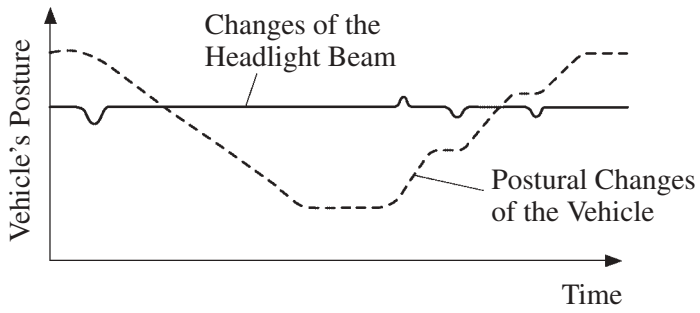
The Skid Control ECU outputs the wheel speeds to the headlight leveling ECU. The wheel speeds are calculated based on the signals which are received from the speed sensors which are part of the ABS.

Actuator

Based on the signals received from the headlight leveling ECU, each actuator moves the reflector in the headlight to vary its beam. This actuator uses a step motor to precisely regulate the angle of the reflector.

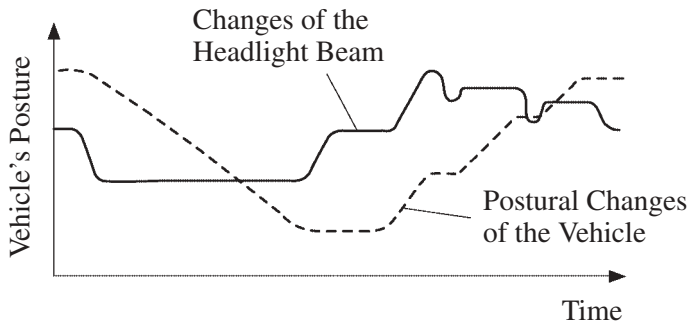
3. Operation

While the vehicle is being driven, the vehicle posture changes constantly in accordance with the road surface conditions and other driving conditions. These postural changes of the vehicle are detected by the height control sensors, which are located in the front suspension and the rear suspension, in the form of the vertical movements (vehicle height variance) of the front and rear wheels. The detected signals are then transmitted to the headlight leveling ECU. The ECU performs a calculation based on three values, the two signals that are transmitted by the sensors, and the wheelbase, and determines the amount of variance in the vehicle's pitch angle.
To enable the actuators to move the reflectors in an effort to cancel out this amount of variance in the pitch angle that has been detected, the ECU transmits control signals to the actuators. In this manner, the ECU regulates the headlights to maintain a constant beam level regardless of any changes in the vehicle's posture.
This system activates when the ignition switch is turned ON and the headlight control switch is turned ON.



Models with Automatic Headlight Beam Level Control

151LBE21



Models without Automatic Headlight Beam Level Control

151LBE20

Initial Set Control

When the ignition switch is turned ON, this function executes the initial set of the headlight leveling ECU. Then, after sampling the wheel speeds, and the vehicle speed has been determined to be below 1.9 km/h (1.2 mph), the step motors are set to their initial setting.

Self-Diagnosis

If a malfunction occurs in any of the sensors or actuators, a warning message appears on the multi-information display in the combination meter. However, once the ignition switch is turned OFF, the warning message will not reappear until a malfunction is detected again.
For details, see the LEXUS IS300/200 Repair Manual Supplement (Pub. No. RM870E).