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Service Category: Vehicle Exterior	Section: Lighting (ext)	
Model Year: 2008	Model: ES350	Doc ID: RM0000011MI01TX
Title: LIGHTING: HEADLIGHT ASSEMBLY: ADJUSTMENT (2008 ES350)		

## ADJUSTMENT

### HINT:

It is possible that a bulb is incorrectly installed, affecting headlight aim. Bulb installation should be considered prior to performing the adjustment procedure.

### 1. VEHICLE PREPARATION FOR HEADLIGHT AIM ADJUSTMENT

(a) Prepare the vehicle according to the following conditions:

- Ensure there is no damage or deformation to the body around the headlights.
- Fill the fuel tank.
- Make sure that the oil is filled to the specified level.
- Make sure that the coolant is filled to the specified level.
- Inflate the tires to the appropriate pressure.
- Unload the trunk and vehicle, ensuring that the spare tire, tools, and jack are in their original positions.
- Sit a person of average weight (68 kg, 150 lb) in the driver's seat.
- Vehicles with height adjustable suspension should set the vehicle height to the lowest setting prior to adjusting the headlight aim.
- Vehicles with manually adjustable headlights should be adjusted to "0".

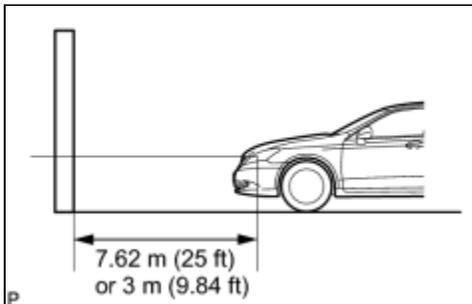
### 2. PREPARATION FOR HEADLIGHT AIMING (Using a headlight aim test machine)

(a) Adjust the headlight aim in accordance with the headlight aim test machine instructions.

### 3. PREPARATION FOR HEADLIGHT AIMING (Using a Screen)

(a) Prepare the vehicle:

- Place the vehicle in a location that is dark enough to clearly observe the cutoff line. The cutoff line is a distinct line, below which light from the headlights can be observed and above which it cannot.
- Place the vehicle at a 90° angle to the wall.
- Create a 7.62 m (25 ft) distance between the vehicle (headlight bulb center) and the wall.
- Make sure that the vehicle is on a level surface.
- Bounce the vehicle up and down to settle the suspension.



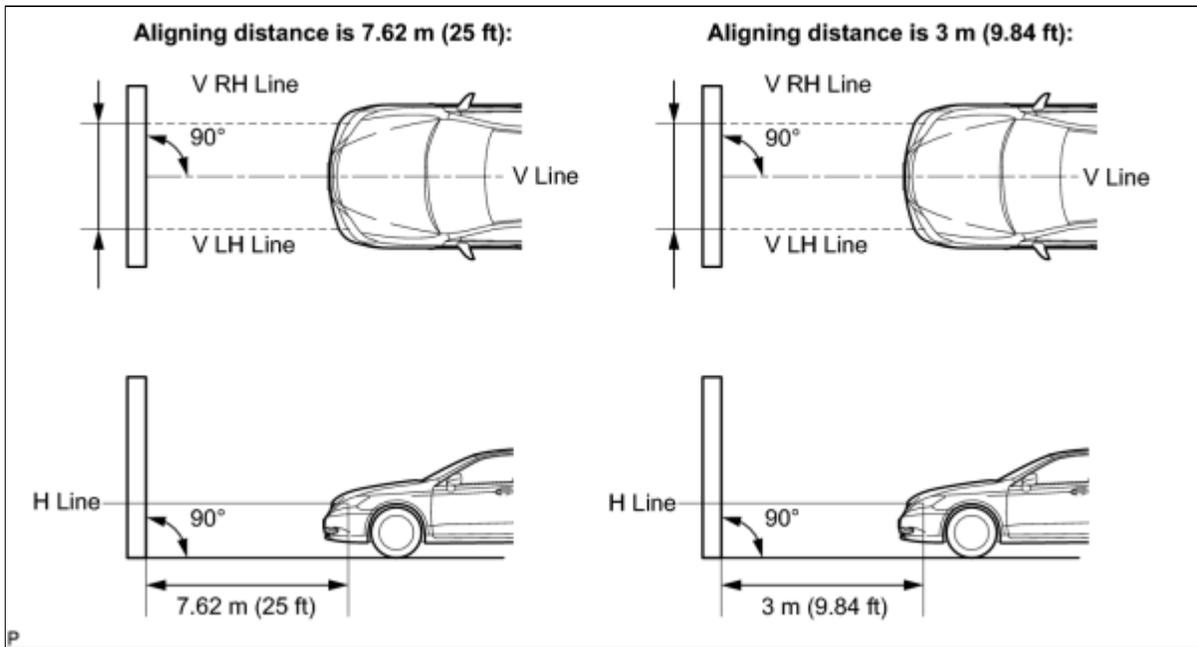
#### NOTICE:

A distance of 7.62 m (25 ft) between the vehicle (headlight bulb center) and the wall is necessary for proper aim adjustment. If sufficient space is not available, secure a distance of exactly 3 m (9.84 ft) to allow for checking and adjustment of headlight aim. (The size of the target zone will change with the distance, so follow the instructions in the illustration.)

(b) Prepare a piece of thick white paper (approximately 2 m (6.6 ft) (height) x 4 m (13.1 ft) (width)) to use as a screen.

(c) Draw a vertical line down the center of the screen (V line).

(d) Set the screen as shown in the illustration.



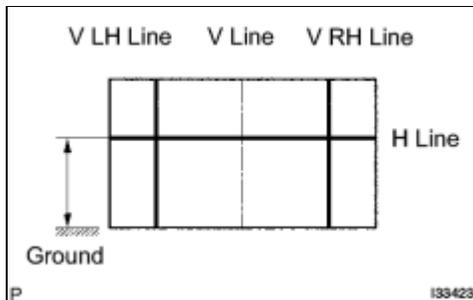
**HINT:**

- Stand the screen perpendicular to the ground.
- Align the V line on the screen with the center of the vehicle.

(e) Draw base lines (H, V LH, and V RH lines) on the screen as shown in the illustration.

**HINT:**

- The base lines differ for "low-beam inspection" and "high-beam inspection."
- Mark the headlight bulb center marks on the screen. If the center mark cannot be observed on the headlight, use the center of the headlight bulb or the manufacturer's name marked on the headlight as the center mark.



(1) H Line (Headlight height):

Draw a horizontal line across the screen so that it passes through the center marks. The H line should be at the same height as the headlight bulb center marks of the low-beam headlights.

(2) V LH Line, V RH Line (Center mark position of left-hand (LH) and right-hand (RH) headlights):

Draw two vertical lines so that they intersect the H line at each center mark (aligned with the center of the low-beam headlight bulbs).

#### 4. HEADLIGHT AIMING INSPECTION

(a) Cover the headlight or disconnect the connector of the headlight on the opposite side to prevent light from the headlight that is not being inspected from affecting the headlight aiming inspection.

**NOTICE:**

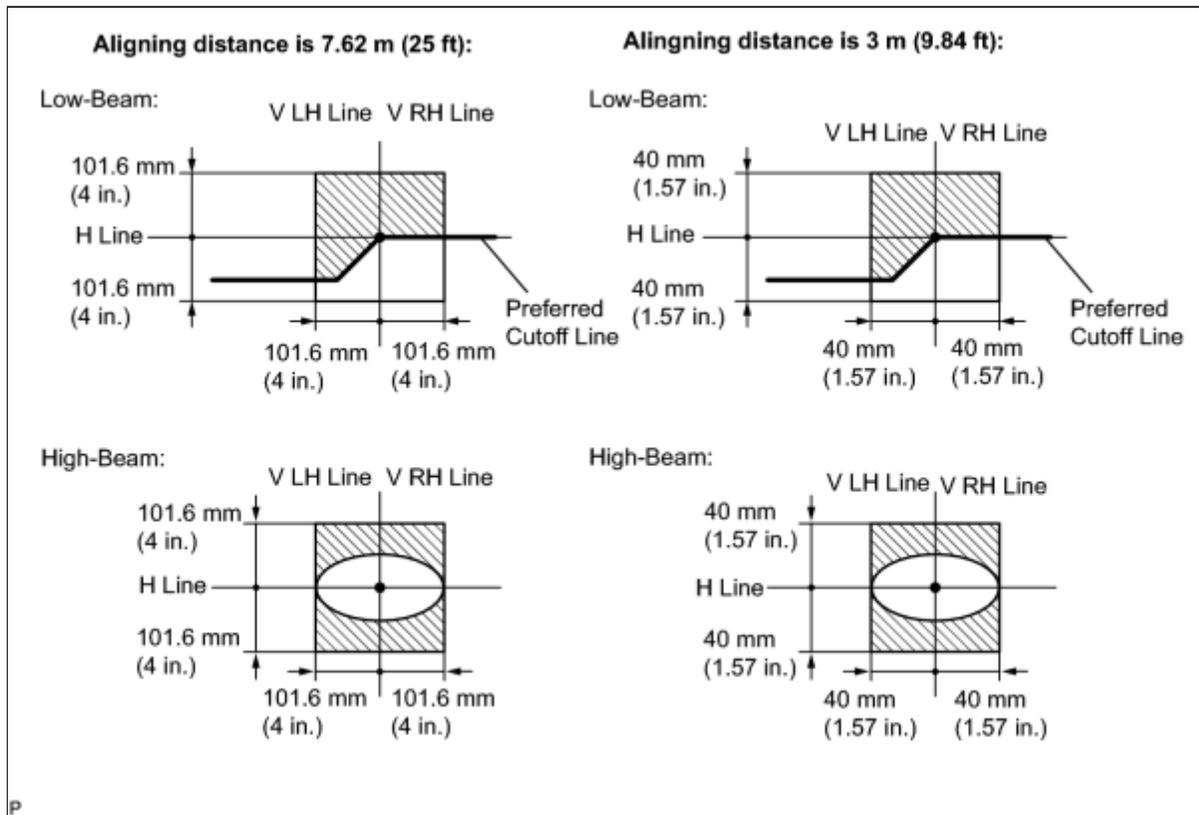
Do not keep the headlight covered for more than 3 minutes. The headlight lens is made of synthetic resin, which

may melt or be damaged due to excessive heat.

**HINT:**

When checking the aim of the high-beam, cover the low-beam or disconnect the connector.

- (b) Start the engine.
- (c) Turn on the headlight and check if the cutoff line matches the preferred cutoff line in the following illustration.



**HINT:**

- Since the low-beam light and the high-beam light are a unit, if the aim on the low-beam is correct, the high-beam should also be correct. However, check both beams just to make sure. (Halogen headlight)
- Since the low beam light and the high beam light on each side have separate reflectors, it is necessary to check and adjust the aim separately for both. (HID headlight)
- If the alignment distance is 7.62 m (25 ft):
  - The cutoff line should be within 101.6 mm (4 in.) above or below the H line as well as 101.6 mm (4 in.) left or right of the V line with low-beam (SAE J599).
- If the alignment distance is 3 m (9.84 ft):
  - The low beam cutoff line should be within 40 mm (1.57 in.) above or below the H line as well as 40 mm (1.57 in.) left or right of the V line (SAE J599).
- If the alignment distance is 7.62 m (25 ft):
  - The high beam center of intensity should be within 101.6 mm (4 in.) above or below the H line as well as 101.6 mm (4 in.) left or right of the V line (SAE J599).
- If the alignment distance is 3 m (9.84 ft):
  - The high beam center of intensity should be within 40 mm (1.57 in.) above or below the H line as well as 40 mm (1.57 in.) left or right of the V line (SAE J599).
- If the alignment distance is 7.62 m (25 ft):

The low beam cutoff line should be the same height as the H line (preferred cutoff line target).

- If the alignment distance is 3 m (9.84 ft):

The low beam cutoff line should be the same height as the H line (preferred cutoff line target).

## 5. HEADLIGHT AIMING ADJUSTMENT

(a) for Halogen headlight

(1) Adjust the aim vertically:

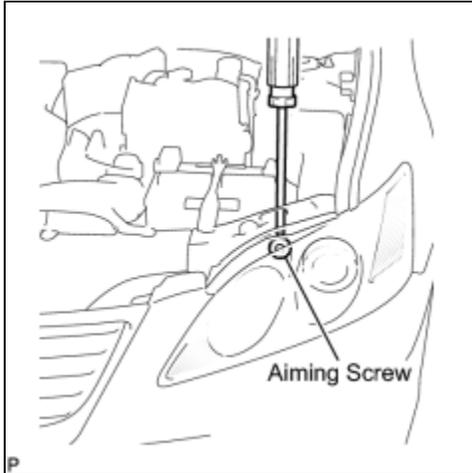
Adjust the aim of each headlight to the specified range by turning each aiming screw with a screwdriver.

### NOTICE:

The final turn of the aiming screw should be made in the clockwise direction. If the screw is tightened excessively, loosen it and then retighten it, so that the final turn of the screw is in the clockwise direction.

### HINT:

- Since the low-beam light and the high-beam light are a unit, if the aim on the low-beam is correct, the high-beam should also be correct. However, check both beams just to make sure.
- If it is not possible to correctly adjust headlight aim, check bulb, headlight unit, and headlight unit reflector installation.
- The headlight aim moves up when turning the aiming screw clockwise, and moves down when turning the aiming screw counterclockwise.



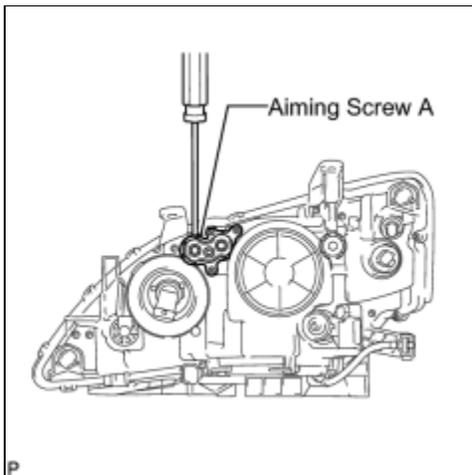
(b) for HID headlight

(1) Adjust the aim vertically:

Adjust the aim of each headlight to the specified range by turning aiming screw A with a screwdriver.

### NOTICE:

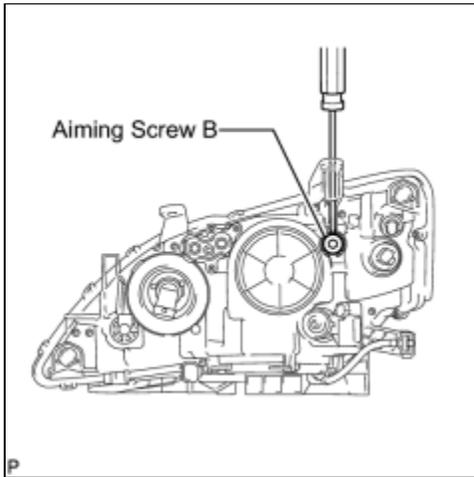
- The high-beam light aim moves in the vertical direction and the low-beam light aim moves in the diagonal direction when aiming screw A is turned. Remember the turning direction and the number of turns of aiming screw A to correct the horizontal position of the low-beam in the next step.
- The final turn of the aiming screw should be made in the clockwise direction. If the screw is tightened excessively, loosen it and then retighten it, so that the final turn of the screw is in the clockwise direction.



(2) Turn aiming screw B the same number of turns and in the same direction as aiming screw A.

### NOTICE:

The final turn of the aiming screw should be made in the clockwise direction. If the screw is tightened excessively, loosen it and then retighten it, so that the final turn of the screw is in the clockwise direction.



**HINT:**

- Since the low beam light and the high beam light on each side have separate reflectors, it is necessary to check and adjust the aim separately for both.
- If it is not possible to correctly adjust headlight aim, check bulb, headlight unit, and headlight unit reflector installation.

