Uniform Procedures For Collision Repair

LA01–Front Driving Lamps

 v.2.3

1. Description

This procedure describes methods for the repair, replacement, and inspection of headlamps, fog lamps, driving lamps, and daylight running lamps. Aiming procedures are also included.

2. Purpose

The purpose of this procedure is to provide industry-accepted requirements for performing high-quality repair of front driving lamps. This procedure is intended for use by professionals who are qualified through training and experience.

3. Referenced Documents

The following documents are considered part of this procedure by reference.

3.1 Procedures

EL01 Wire Repair
EL11 Troubleshooting
LA21 Stop, Turn, And Cornering
LA31 Switches And Controls
PS01 Personnel Safety

3.2 Other Information

Equipment-specific information
Regional headlamp aiming requirements
SAE-recommended practice for headlamp aiming equipment
Vehicle-specific repair information

4. Equipment And Material Requirements

4.1 Electronic Equipment

Use electronic testing equipment as described in **EL11**.

4.2 Aiming Equipment

The use of these types of headlamp and fog-lamp aiming equipment is included in this procedure:

- ❏ on-vehicle mechanical aimer
- ❏ off-vehicle mechanical aimer
- ❏ off-vehicle electronic aimer

5. Damage Analysis

5.1 General Damage

Inspect lamp assemblies for these conditions:

- ❏ improper operation
- ❏ visible damage
- ❏ improper previous repairs
- ❏ loose or damaged mountings
- ❏ damaged or missing trim or fasteners
- ❏ moisture behind the lens

Plan to replace any damaged parts. Verify the availability of replacement parts.

5.2 Electrical Parts

Inspect lamp assembly electrical parts for these conditions or types of damage:

- ❏ broken or burned-out bulb
- ❏ damaged or corroded bulb socket
- ❏ blown fuse
- ❏ cut, pinched, or corroded wires
- ❏ damaged or corroded switches or relays
- ❏ loose or corroded grounds or connectors
- ❏ proper illumination of the instrument panel

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5. Damage Analysis (cont'd)

It may be required to partially disassemble the lamp assembly to determine the condition of the connectors and other electrical parts. If electrical parts do not function correctly, plan to troubleshoot the circuit to isolate the cause. See **EL11**.

Determine the parts that will be replaced and the wiring that will be repaired. See **EL01** for wire repair procedures. Verify the availability of replacement parts.

6. Personnel Safety

6.1 General Safety

General safety information is in **PS01**.

6.2 Electrical Safety

Electrical testing safety information is in **EL11**.

Make sure the lamp switch is OFF before removing any lamp parts.

6.3 Halogen And Gas-Discharge Lamp Safety

Halogen lamps become very hot in use. Gas-discharge lamps operate on high voltage. Both of these bulbs contain gas under pressure. To prevent injury when handling a halogen or gas-discharge lamp:

- ❏ Allow a halogen bulb and attaching hardware to cool before removing.
- ❏ Handle the bulb only by its base. Do not touch the glass.
- ❏ Keep moisture away from the bulb.
- ❏ Carefully dispose of damaged bulbs in a proper container.

7. Environmental Safety

Does not apply.

8. Vehicle Protection

8.1 Lamp And Adjacent Parts

To prevent damage to the lamp assembly and adjacent parts:

- ❏ Protect the lamp and adjacent parts during removal and installation.
- ❏ Do not allow bare hands, or other sources of contamination, to touch halogen or gas-discharge lamp bulbs.

8.2 Electrical Parts

To protect electrical parts from damage:

- ❏ Make sure the lamp switch is OFF before disconnecting the electrical connector.
- ❏ Protect connectors and wiring from dirt, heat, static electricity, and moisture.
- ❏ Loosen or remove any wiring harnesses or electrical parts that could be damaged during the repair process.

9. Repair Procedure

9.1 Lamp Assembly Removal

Note: The headlamp assembly may be part of the same unit as the directional or cornering lamp assembly. This may require removal, and replacement, of both assemblies if damaged.

To remove a lamp assembly:

- ❏ 1. Open the hood, if required.
- ❏ 2. Remove or reposition access panels and other parts, if required for access or to avoid damage.
- ❏ 3. Remove fasteners holding the lamp housing. Replace one-time or damaged fasteners, if required. Use replacement fasteners that are the same grade, size, and type as the original fasteners.
- ❏ 4. Disconnect the electrical connector.
- ❏ 5. Remove the lamp assembly from the vehicle.

9.2 Lamp Installation

To install a replacement lamp assembly:

- ❏ 1. Connect the electrical connector to the lamp.

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❑ 2. Position the lamp assembly following the original mounting method, and install fasteners holding the lamp housing.
❑ 3. Torque the fasteners to the vehicle maker's recommendations.
❑ 4. Reinstall all parts removed or repositioned for access.
❑ 5. Close the hood, and check the aim of both headlamps. See **9.3**.

9.3 Headlamp, Driving Lamp, Or Fog Lamp Aiming

These conditions must be met before aiming the headlamps, driving lamps, or fog lamps:

❑ The vehicle is level.
❑ The doors are closed.
❑ The ride height is within specifications.
❑ A driver or a weight of about 75 kg (165 lb) is in the driver's seat.
❑ There is no other weight added to the vehicle, unless the load is normal for the vehicle's intended use.

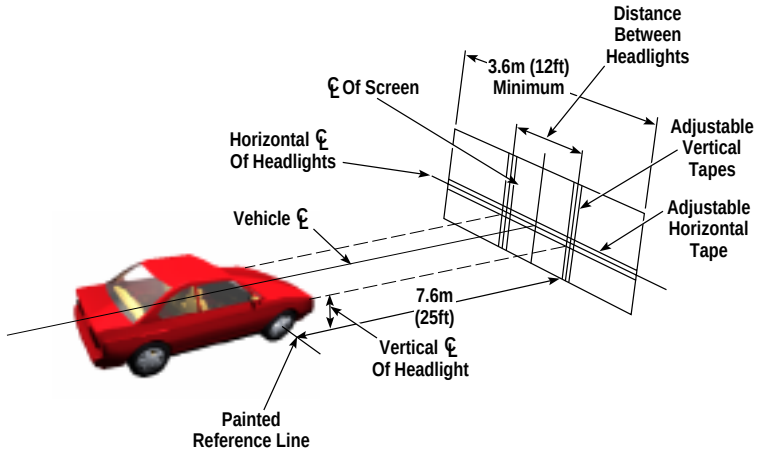
Note: Some vehicle makers require a full fuel tank. Follow the vehicle maker's recommendations.

Follow any regional headlamp, driving, or fog lamp aiming requirements.

Some headlamp systems have on-board indicators for aiming. Most headlamp systems require external aiming equipment. Follow the vehicle or equipment maker's procedures for headlamp aiming using these methods. For aiming headlamps, driving lamps, and fog lamps, the following screen method may be used.

To aim headlamps, driving lamps, and fog lamps using the screen method:

❑ 1. Position the normally loaded vehicle on a level surface, facing a wall or screen, 7.6 m (25 ft) away. Make sure the ride height is correct.
❑ 2. Locate the vehicle centerline on the wall or screen. This may require sighting down the length of the vehicle through the backlite. Use tape to mark the centerline. See the figure at right.



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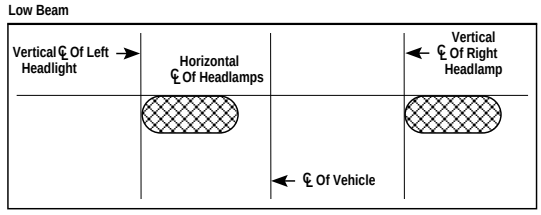
9. Repair Procedure (cont'd)

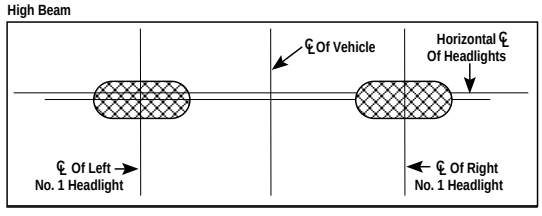
❑ 3. Locate the horizontal centerline of the lamps by measuring from the floor to the center of the lamps. Use tape to transfer this measurement to the wall or screen.

❑ 4. Measure from the vehicle centerline to the vertical center of the lamps. Use tape to transfer these measurements to the wall or screen.

❑ 5. For headlamps, turn on the low beam lamps and inspect the oval beam projections on the wall or screen. The ovals should be at the same height. The left edge of each oval should be at the corresponding headlamp vertical centerline mark. The top of each oval should be touching, but not above, the horizontal centerline mark. See the figure at right.



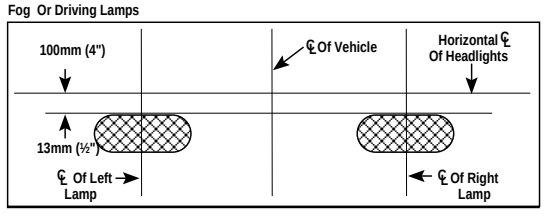
Repeat this procedure for the high beams, using the figure below. Each oval should be centered on the horizontal centerline mark and centered on the corresponding vertical centerline mark. For four-lamp systems, cover the low-beam lamps when checking the high beams.



Note: Some types of headlamps require low-beam adjustment only. Follow the vehicle maker's recommendations.

❑ 6. For fog or driving lamps, the top edge of the oval should be 100 mm (4") below the horizontal centerline of the fog or driving lamp. The center of each oval should be centered on the vertical centerline of the fog or driving lamp. See the figure at right.

❑ 7. Adjust the beam positions, if required.



10. Use Of Recycled (Salvage) Parts

10.1 Salvage Part Requirements

Do not install lamp parts having any of these defects:

- ❏ inoperable
- ❏ unrepairable damage
- ❏ corrosion that has caused pitting
- ❏ improper previous repairs
- ❏ missing mounting locations
- ❏ damaged lens

11. Inspection And Testing

11.1 Inspection Of A Replaced Lamp Assembly

After installation, inspect a lamp assembly for these conditions:

- ❏ proper operation
- ❏ proper mounting and installation of trim
- ❏ fasteners torqued to the vehicle maker's recommendations
- ❏ proper bulb
- ❏ proper aiming
- ❏ clean lens
- ❏ proper brightness in relation to other lamps

Correct any defects.