

Headlight Aim Checking and Adjusting

Before checking or adjusting the headlight aim, do the following:

- Remove large amounts of mud or ice from the underside of the fenders.
- Check the springs for sagging or broken leaves.
- Check the suspension for proper functioning of the leveling mechanism. On cabs with air suspensions, make sure that the height is properly adjusted.
- Check for damage to the hood and hinge assembly. Repair as necessary.
- Clean the headlight lenses.
- With the vehicle unloaded, check that the tires are inflated to the recommended air pressure.

Checking

1. Park the vehicle on a level surface 25 ft (7.6 m) from a screen or wall that can be used for aiming the headlights. See **Fig. 1**. Shut down the engine, apply the parking brakes, and chock the front tires.

NOTE: The low-beam headlight is the top bulb in the dual-beam assembly.

2. On each headlight, find the bulb center. See **Fig. 2**.
3. Measure the distance from the ground to the center of each low-beam bulb. Note those distances.
4. On the screen or wall 25 ft (7.6 m) away, make the appropriate markings directly across from each headlight and at the same height as measured for the low-beam bulb.
5. Turn on the headlights to the low-beam setting. See **Fig. 3** for the ideal and acceptable patterns for both headlights.
 - If either or both headlights do not aim into the inner edges of the centerline, follow the adjusting procedure below.
 - If both headlights come close to the inside of each headlight centerline (as shown), no further work is needed. Turn off the headlights and remove the chocks from the front tires.

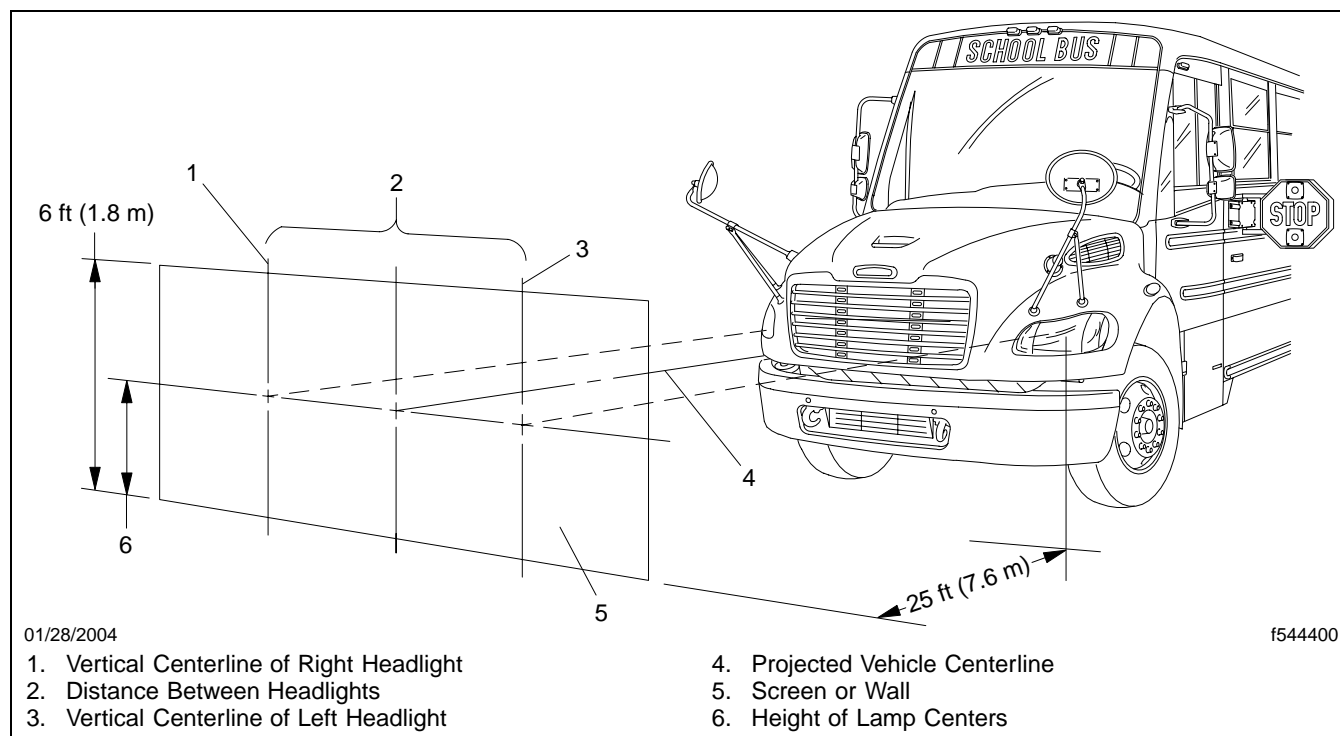


Fig. 1, Headlight Aiming Screen or Wall

Headlight Aim Checking and Adjusting

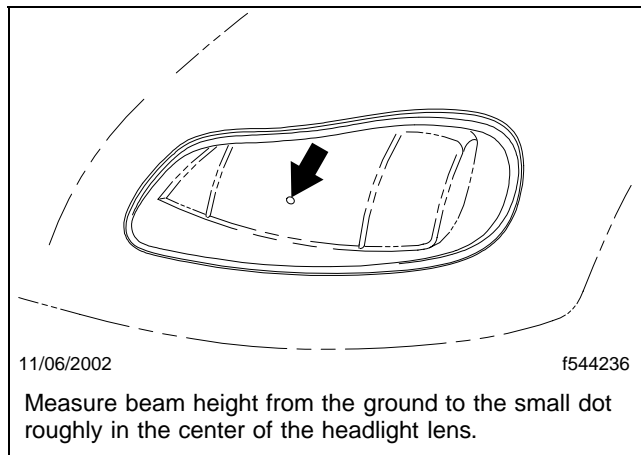


Fig. 2, Headlight Beam Height Adjusting Dot

Adjusting

1. Lift the flap over the rear end of the headlight bucket to expose the two plastic adjusting knobs on each headlight. See **Fig. 4**.

NOTE: Horizontal aim should not be adjusted in the field.

2. With the vehicle parked 25 ft (7.6 m) from the screen or wall, put the headlights on low beams, and turn both adjusting knobs the same amount, as needed to adjust the lights until the beam pattern meets the acceptable standard in **Fig. 3**.

NOTE: Blocking off each light is not necessary, but it can help to present a clearer beam pattern.

3. Remove the chocks from the front tires.

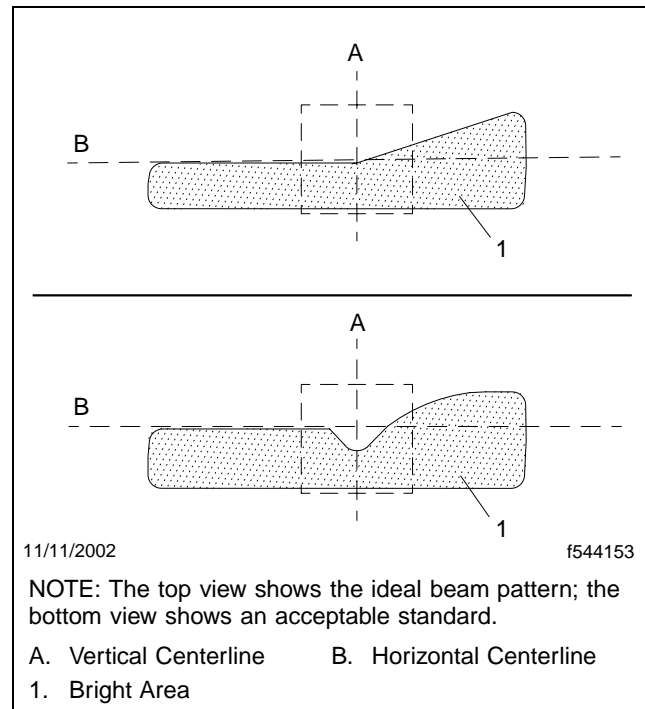


Fig. 3, Headlight Beam Pattern

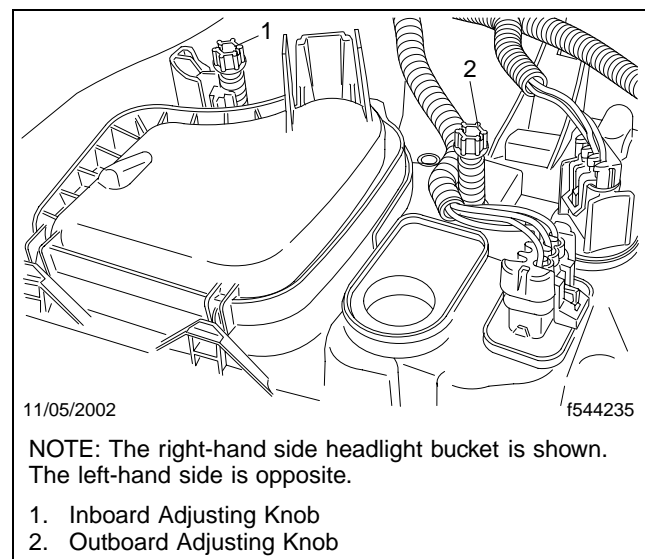


Fig. 4, Headlight Adjusting Knobs

Exterior Lights Replacement

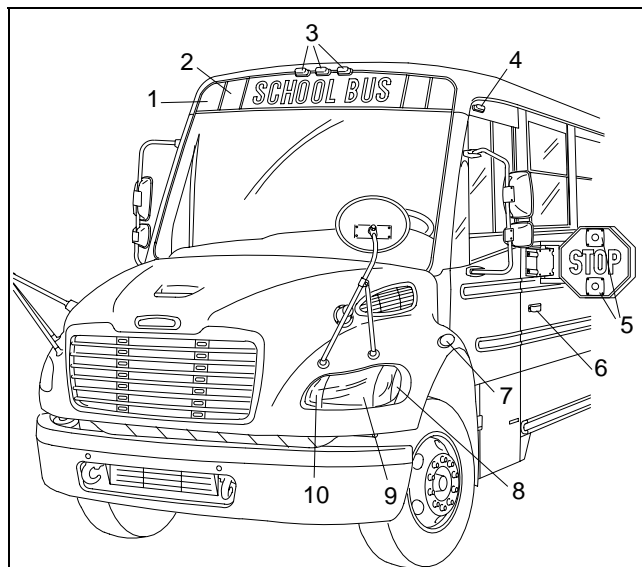
See **Fig. 1** for an overview of the exterior lights.

Before working on the vehicle, park it on a level surface and shut down the engine. Set the parking brake and chock the front and rear tires.

NOTE: Use gloves or a clean cloth or paper towel when handling halogen bulbs; don't handle them with bare hands. Oil from the skin causes overheating and rapid blowout. If bulbs are handled accidentally, use a cotton swab dipped in rubbing alcohol to remove oil.

Headlight/Turn Signal Assembly Replacement

1. Tilt the hood.
2. Secure the headlight splash guard out of the way.



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NOTE: The parking lights, front clearance lights, and taillights all function as turn signals.

- | | |
|--|-----------------------------------|
| 1. Upper Turn Signal | 6. Side Body Marker Light |
| 2. Upper Hazard Lights | 7. Front Fender Marker Light |
| 3. Clearance and Identification Lights | 8. Headlamp-Mounted Turn Signal |
| 4. Side-Mounted Turn Signal | 9. Headlamp |
| 5. Stop Sign Reflectors | 10. Headlamp-Mounted Hazard Light |

Fig. 1, Exterior Lights

3. Unplug the headlight and turn signal electrical connectors and cut any tie-straps that may be holding them to the headlight bucket assembly.
4. Remove the nuts from the two lower mounting adjustment studs. See **Fig. 2**.
5. Remove the Torx® capscrew from the upper mounting bracket.
6. Remove the headlight/turn signal assembly.
7. Place a new assembly onto the mounting studs and install the two nuts and washers.

NOTE: Before installing the new assembly, verify that the lower mounting adjustments on the new assembly are set the same as the old assembly.

8. Install the Torx capscrew in the upper mounting bracket.
9. Plug in the two electrical connectors.
10. Verify the proper operation of the lights.
11. Return the headlight splash guard to its original operating position.
12. Check and adjust the headlight aim as described in **Subject 100**, Headlight Aim Checking and Adjusting.

Headlight Bulb Replacement

1. Tilt the hood.
2. Remove the inner headlight cover by pressing the tab at the top and pulling out.
3. Unplug the headlight connector. See **Fig. 2**.
4. Twist the high beam or low beam socket assembly 1/8 of a turn counter-clockwise to remove it from the headlight bucket assembly and access the bulb.
5. Protect the bulb with gloves or a cloth and unplug it from the socket. The bottom bulb in the assembly is the high beam lamp; the top bulb in the assembly is the low beam lamp.
6. Protect the bulb with gloves or a cloth and line up the bulb tabs and insert a new bulb into the socket then twist it 1/8 of a turn clockwise to secure it.
7. Plug in the connector.

Exterior Lights Replacement

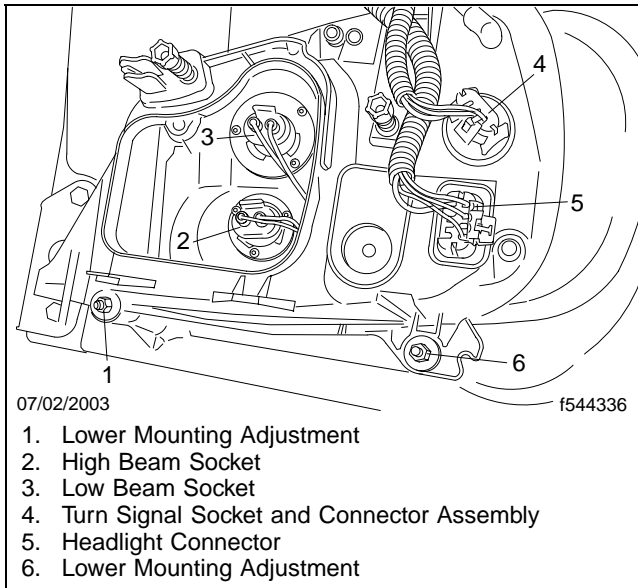


Fig. 2, Headlight Bucket (Rear View)

8. Replace the inner headlight cover and snap it into place.
9. Close the hood.
10. Verify operation of the lights.
11. Check and adjust the headlight aim as described in **Subject 100**, Headlight Aim Checking and Adjusting.

Front Turn Signal Bulb Replacement

1. Tilt the hood.
2. Twist the turn signal connector and socket assembly 1/8 turn counter-clockwise and remove it from the headlight bucket.
3. Protecting the bulb with gloves or a cloth, pull the bulb straight out from the socket.
4. To provide corrosion protection, coat the base of the new bulb with dielectric grease. For approved lubricants, see the applicable table in **Specifications 400**.
5. Protecting the bulb with gloves or a cloth, push the new bulb straight into the socket.

6. Place the connector and socket assembly in the headlight bucket and twist it 1/8 turn clockwise to lock it in place.
7. Verify proper operation of the turn signal lights.

Clearance and Identification Light Assembly Replacement

1. Access the mounting nuts and electrical connections from inside the vehicle.
 - 1.1 Remove the left-hand and right-hand overhead map pockets to access the outer two lights.
 - 1.2 Remove the center console/dome light assembly or headliner to access the center three lights.
2. Unplug the connector.
3. Remove the two mounting nuts and remove the light assembly.
4. Install a new clearance light. Tighten the two mounting nuts to 60 lbf·in (677 N·cm).
5. Seal the hole with silicone sealant.
6. Plug in the connector.
7. Replace the headliner or center console/dome lamp, and/or map pockets.

Clearance and Identification Light Bulb Replacement

1. From the outside of the vehicle, remove the external capscrew fastening the clearance light lens to the base.
2. Lift the lens cover at the rear with a screwdriver, and slide the cover forward off the locking tab.
3. Pull the bulb straight out to remove it.
4. To provide corrosion protection, coat the base of the new bulb with dielectric grease. For approved electrical terminal lubricants, see the applicable table in **Specifications 400**.
5. Plug in the new bulb and test for proper operation.

Exterior Lights Replacement

6. Install the lens on the base, making sure that it is fully seated.
7. Secure the clearance light lens in place with the mounting screw.

IMPORTANT: Do not over-tighten the mounting screw, or damage to the lens may occur.

Front Fender Marker Light Assembly Replacement

1. Tilt the hood.
2. If the harness is being replaced, cut the two tie-straps securing it at the molded splash guard.
3. Twist the marker light connector 1/8 turn counterclockwise to unplug the connector and harness.
4. Remove the two mounting screws that attach the lens to the fender.
5. Remove the marker light lens.
6. Install a new marker light lens onto the fender, attaching it with the two mounting screws.

IMPORTANT: Do not over-tighten the mounting screws, or damage to the lens may occur.

7. Install a new harness if required, and plug in the electrical connector and bulb socket. Twist it clockwise 1/8 turn to secure.
8. If a new harness was installed, secure it to the molded plastic inner wheel well shroud using two tie-straps at the openings. Secure the tie-straps to the connector.

Front Fender Marker Light Bulb Replacement

1. Tilt the hood.
2. Twist the connector 1/8 turn counterclockwise to unplug the connector and bulb socket.
3. Pull the bulb straight out of the socket to remove it. Push a new bulb straight into the socket to replace it.
4. Insert the connector and bulbs into the lens assembly and turn 1/8 turn clockwise to secure.

Stop Light and Taillight Assembly Replacement

1. Unplug the electrical connectors to the taillight assembly.

NOTE: There are two connectors on the left-hand side of the vehicle, and one connector on the right-hand side of the vehicle.

2. Remove the three mounting nuts and remove the taillight assembly from the mounting bracket.
3. If the new taillight assembly did not come supplied with bulbs, follow the steps in **Stop Light and Taillight Bulb Replacement**.
4. Place a new taillight assembly on the mounting bracket and secure the three mounting nuts.
5. Plug in the connectors.

Stop Light and Taillight Bulb Replacement

1. Remove the four screws that attach the lens to the housing. See **Fig. 3**.
2. Press in the bulb and turn it counterclockwise to release it from the socket. See **Fig. 4**.
3. To provide corrosion protection, coat the base of the new bulb with dielectric grease. For approved electrical terminal lubricants, see the applicable table in **Specifications 400**.

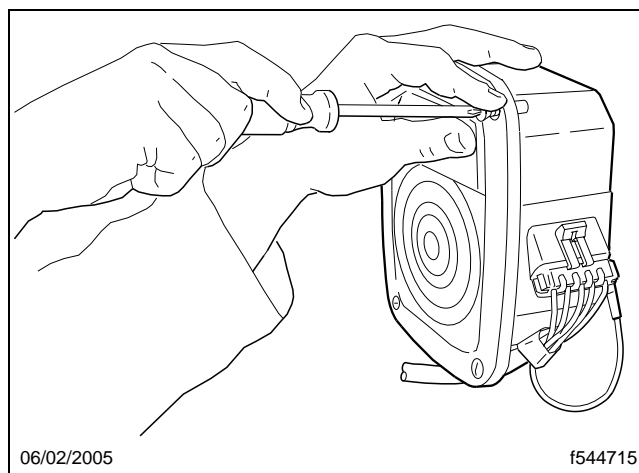


Fig. 3, Taillight Lens Removal

Exterior Lights Replacement

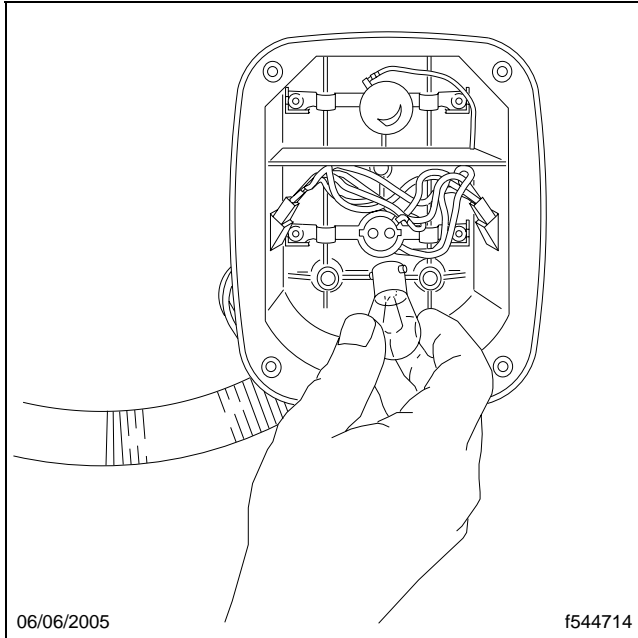


Fig. 4, Taillight Bulb Removal

4. Install the new bulb, pressing and turning 1/8 turn clockwise to lock it. Test the bulb for proper operation.
5. Install the lens on the housing. Fasten it in place with the mounting screws.

IMPORTANT: Do not over-tighten the mounting screws, or damage to the lens may occur.

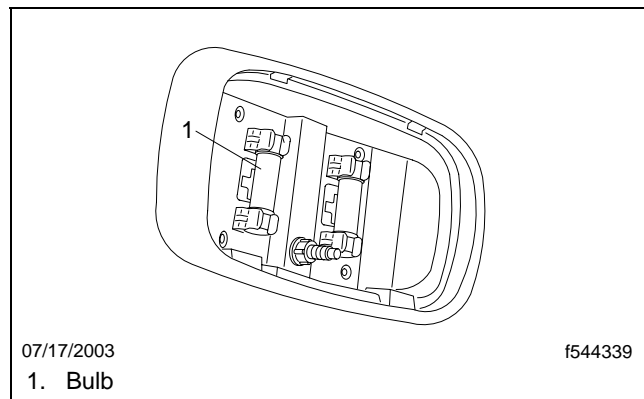
Interior Lights Replacement

Cab Rear Dome Light Bulb Replacement

1. Remove the lens using a flat-blade screwdriver to release the two tabs on the bottom of the lens, then gently pry the lens from the bottom of the housing.
2. Remove the two bulbs from the lock clips by pulling them straight out. See **Fig. 1**.
3. Press new bulbs into the lock clips.
4. Insert the two tabs on the lens into the slots in the top of the housing, then push the bottom of the lens into place, locking the tabs.

Cab Rear Dome Light Assembly Replacement

1. Remove the lens using a flat-blade screwdriver to release the two tabs on the bottom of the lens, then gently pry the lens from the bottom of the housing.
2. Insert the screwdriver into the lower slots in the housing to release the two spring clips, then remove the assembly from the headliner.
3. Unplug the electrical connector.
4. Plug in the electrical connector of the new assembly.
5. Align the tabs on the top edge of the new assembly and press the lower edge of the assembly into place until the locking tabs click into place.

**Fig. 1, Cab Rear Dome Light****Overhead Console Map/Reading Light Assembly Bulb Replacement**

NOTE: The bulbs are replaceable in the inner larger lights only. The smaller lights use non-replaceable LEDs.

1. Using a flat-blade screwdriver, release the tab by pushing on the edge of the lens that is indented, then gently pry the lens from the housing.
2. Remove the bulb from the lock clip by pulling it straight out.
3. Press a new bulb into the lock clip.
4. Insert the tab on the lens into the slots in the housing, then push the lens into place, locking the tabs.

Overhead Console Map/Reading Light Assembly Replacement

1. Remove the three Torx® screws that hold the center overhead panel in place. See **Fig. 2**.
2. Lower the assembly and unplug the connector to the light assembly.
3. Remove the four screws that attach the light assembly to the panel.
4. Remove the light assembly, and replace.

Interior Lights Replacement

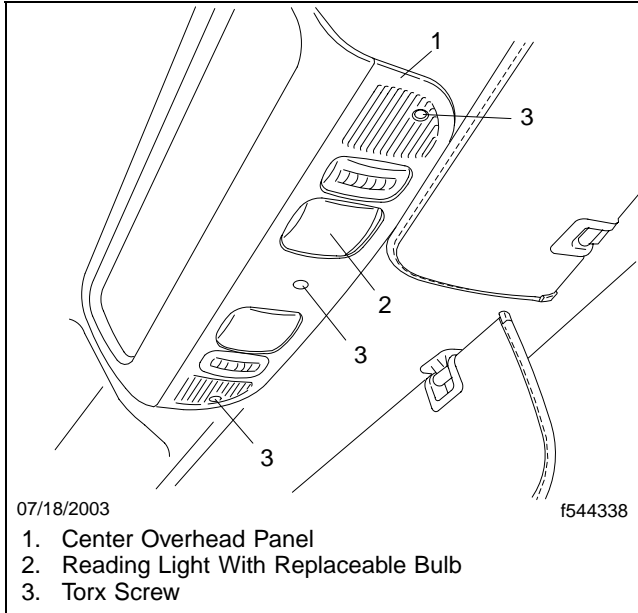


Fig. 2, Overhead Panel With Map/Reading Lights

Light Monitor Replacement

General Information

The light monitor allows the driver to monitor the functionality of lighting on the vehicle, especially the rear of the vehicle. It is located on the switch panel to the left of the driver. See **Fig. 1**. The monitor is designed to match the layout of the front and rear exterior lights on the vehicle, with LEDs on the monitor representing various lights on the vehicle. The Switch Hub Module controls the functionality of the light monitor.

Replacement

1. Disconnect the negative leads from the batteries.
2. Remove the fasteners that secure the switch panel on the driver's left side against the cab wall, then lift the switch panel away from the opening. See **Fig. 2**.
3. Unplug the ribbon-cable harness from the back of the light monitor by gently pulling outward on the connector's side tabs to unlock the connector. See **Fig. 3**.

4. From the back, remove the two screws and washers that secure the light monitor printed circuit board to the switch panel and remove the board.
5. If necessary, remove the metal mounting bar and light monitor panel by removing the three locknuts that secure them.

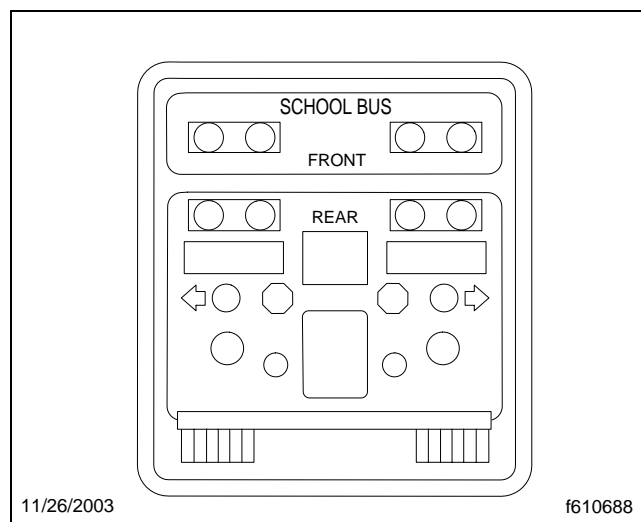


Fig. 1, Light Monitor Panel

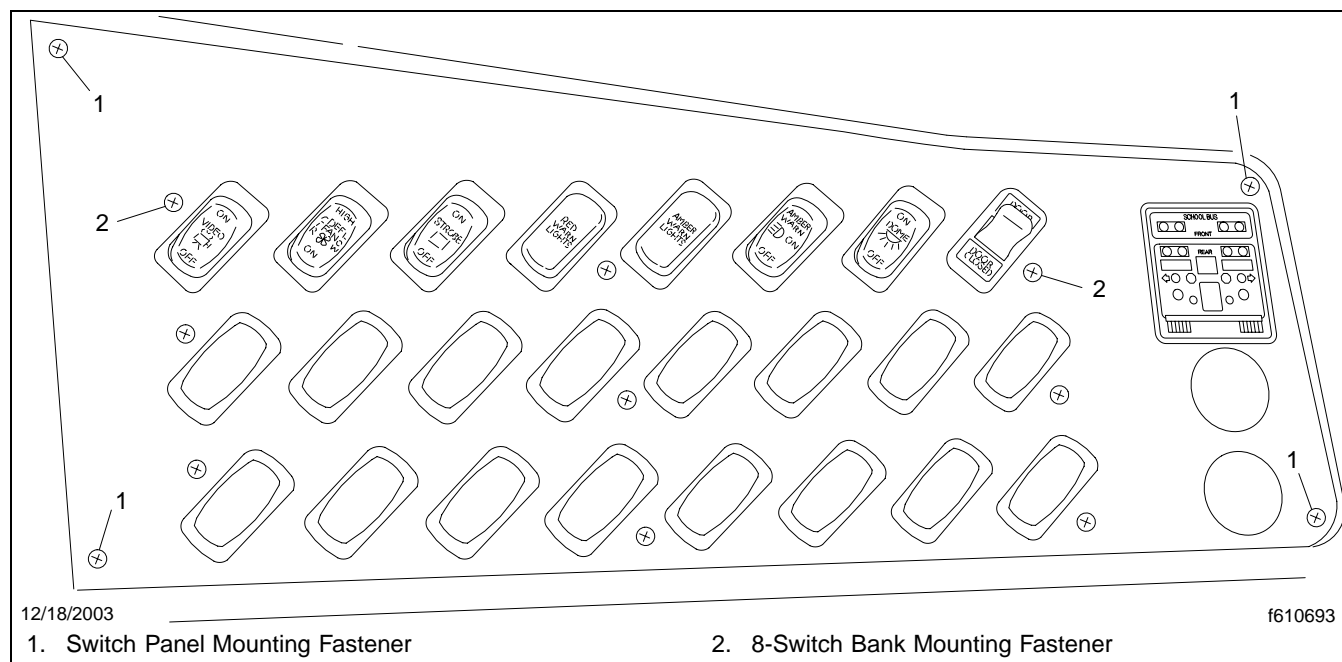


Fig. 2, Switch Panel Mounting Fastener Locations

Light Monitor Replacement

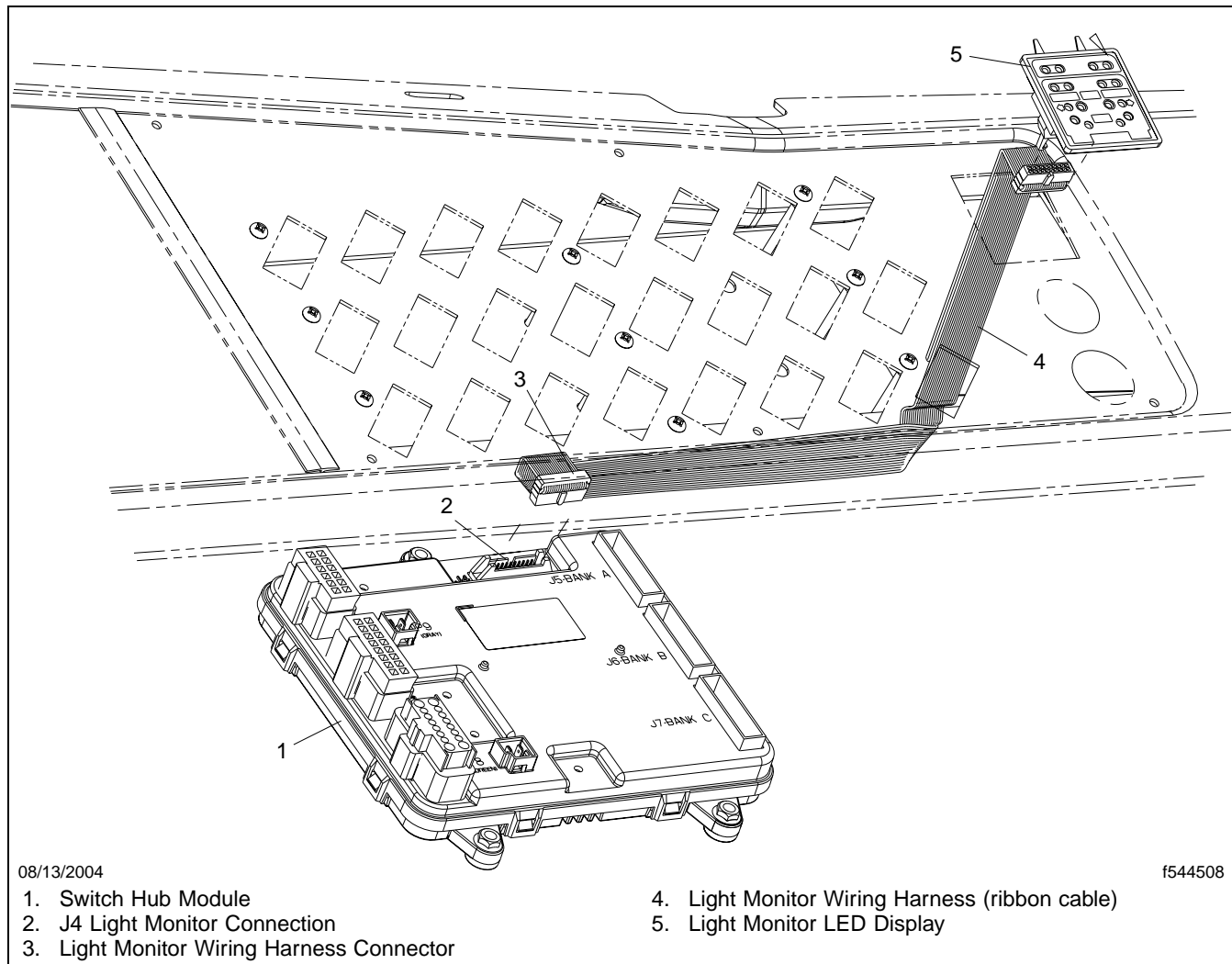


Fig. 3, Light Monitor Installation

6. To install the light monitor panel, place it over the opening from the front of the switch panel, place the metal mounting bar across the back of the panel, then secure them both to the switch panel with three locknuts.
7. Properly orient the light monitor printed circuit board and place it behind the switch panel, then secure it with the two screws and washers.
8. Connect the ribbon-cable harness to the back of the light monitor and press it until the tabs lock.
9. Place the switch panel in its opening and install the fasteners that secure the panel.
10. Connect the batteries.
11. Check to make sure electrical components work.

Approved Electrical Lubricants	
Manufacturer	Lubricant
Standard Oil Co.	White Vasoline
Shell Oil Co.	No. 71032; No. 71306
Texaco, Inc.	No. 955
Quaker State	No. NYK-77

Table 1, Approved Electrical Lubricants

Replacement Bulb Part Numbers	
Description	Part Number
Headlight, Low Beam	WEE 9006
Headlight, High Beam	WEE 9005
Front Turn Signal Light	WEE 3157
Clearance and Identification Light	WEE 193
Brake/Rear Turn Signal Light	WEE 1157
Backup Light	WEE 1156
Front Fender Marker Light	WEE 194

Table 2, Replacement Bulb Part Numbers