



Installation and Operation Instructions

Evolution Series Light Bars (36"-72")

IMPORTANT! Read all instructions before installing and using. Installer: This manual must be delivered to the end user.



WARNING

Failure to install or use this product according to manufacturers recommendations may result in property damage, serious injury, and/or death to those you are seeking to protect!



Do not install and/or operate this safety product unless you have read and understand the safety information contained in this manual.

1. Proper installation combined with operator training in the use, care, and maintenance of emergency warning devices are essential to ensure the safety of emergency personnel and the public.
2. Emergency warning devices often require high electrical voltages and/or currents. Exercise caution when working with live electrical connections.
3. This product must be properly grounded. Inadequate grounding and/or shorting of electrical connections can cause high current arcing, which can cause personal injury and/or severe vehicle damage, including fire.
4. Proper placement and installation is vital to the performance of this warning device. Install this product so that output performance of the system is maximized and the controls are placed within convenient reach of the operator so that s/he can operate the system without losing eye contact with the roadway.
5. It is the responsibility of the vehicle operator to ensure daily that all features of this product work correctly. In use, the vehicle operator should ensure the projection of the warning signal is not blocked by vehicle components (i.e., open trunks or compartment doors), people, vehicles or other obstructions.
6. The use of this or any other warning device does not ensure all drivers can or will observe or react to an emergency warning signal. Never take the right-of-way for granted. It is your responsibility to be sure you can proceed safely before entering an intersection, drive against traffic, respond at a high rate of speed, or walk on or around traffic lanes.
7. This equipment is intended for use by authorized personnel only. The user is responsible for understanding and obeying all laws regarding emergency warning devices. Therefore, the user should check all applicable city, state, and federal laws and regulations. The manufacturer assumes no liability for any loss resulting from the use of this warning device.

Introduction:

The ECCO Evolution Series are powerful, permanently mounted, low-profile light bars available in several sizes.

Specifications:

Length	36"	48"	54"	60"
Height	4.3"	4.3"	4.3"	4.3"
Depth	8.5"	8.5"	8.5"	8.5"
Weight	10 Lb	14 Lb	18 Lb	20 Lb

Input Voltage: 12 VDC system
Cable Length: 15' - 16'

Unpacking:

Carefully remove the light bar and place it on a flat surface. Examine the unit for transit damage, and locate all parts. If damage is found, or parts are missing, contact the transit company or ECCO. Do not use damaged or broken parts.

Installation & Mounting:

Important! This unit is a safety device, and it must be connected to its own separate, fused power point to assure its continued operation should any other electrical accessory fail.



Caution: When drilling into any vehicle surface, make sure that the area is free from any electrical wires, fuel lines, vehicle upholstery, etc. that could be damaged.

Permanent Mounting:

Before proceeding with installation, plan all wiring and cable routing. Select the mounting location for the light bar on a flat, smooth surface, light assembly should be centered (left to right). If the light bar is to be mounted on a curved surface, such as on the roof of the vehicle, choose a placement with the least amount of curvature. The mounting location for the light bar should be chosen such that there is maximum visibility to the oncoming traffic. Use the following instructions for mounting (refer to Figure 1).

1. Position the mounting feet (without hardware) on the vehicle in the desired location.

**CAUTION!**

Disable power before wiring up the beacon/strobe head, to prevent accidental shorting, arcing, and electrical shock.

Important! This system must be connected to a separate, fused power point. Do not wire in parallel with any other accessory.

General Wiring Instructions:

1. Route 14AWG or larger wires from the vehicle positive (battery, alternator, fuse block) to the switch panel in the cab. Use high-temperature wire if it passes through the engine compartment. Install an inline fuse close to the power take-off point. For each circuit, use a fuse according to the following tables:

2. Connect the power wires to the positive side of the appropriate lightbar switch or switches of the switch panel with quick-disconnect terminals or by soldering.
3. After the light bar has been mounted, route the lightbar cable into the vehicle to the switch panel location
4. Connect the 16 AWG wires (14 AWG on the 2-Conductor + Ground System) of the lightbar cable to the switched side of each switch. See the tables below for wire color / function legend. Your bar may not be equipped with all of these functions; unused wires may be trimmed flush with cable end.
5. Connect the lightbar cable ground wire to a solid ground connection on the vehicle. If this wire needs to be lengthened, use a 10AWG or larger White wire.
6. Use cable ties to secure all cables and wires.

2 CONDUCTOR + GROUND CABLE SYSTEM		
CIRCUIT	WIRE COLOR	FUSE VALUE (12V SYSTEM)
OUTER ROTATORS (2 OUTERMOST)	RED	15 AMP
INNER ROTATORS (ALL OTHER)	BLUE	20 AMP
GROUND	BLACK	N/A

12 CONDUCTOR + GROUND CABLE SYSTEM		
CIRCUIT	WIRE COLOR	FUSE VALUE (12V SYSTEM)
OUTER ROTATORS (2 OUTERMOST)	RED	15 AMP
INNER ROTATORS (ALL OTHERS)	BLUE	15 AMP
STOP / TAIL / TURN (DOT)**	VIOLET	VEHICLE FUSE
PASSENGER SIDE STOP / TURN		
STOP / TAIL / TURN (DOT) I.D. (DOT)/TAIL	BROWN	VEHICLE FUSE
STOP / TAIL / TURN (DOT) DRIVER SIDE STOP / TURN	YELLOW	VEHICLE FUSE
REAR FACING WORK LIGHTS	GRAY	15 AMP
ALTERNATING FLASHER – FRONT	BLACK	10 AMP
ALTERNATING FLASHER – REAR	WHITE W/RED STRIPE	10 AMP
STROBE SYSTEM POWER	WHITE W/BLACK STRIPE	10 AMP (2 STROBES) 15 AMP (4 STROBES)
STROBE SYSTEM DUAL / QUAD FLASH CONTROL	ORANGE (GROUNDED FOR QUAD MODE)*	NO FUSE REQ'D
STROBE SYSTEM DAY / NIGHT FLASH CONTROL	GREEN (GROUNDED FOR NIGHT MODE)*	NO FUSE REQ'D
NOT USED	WHITE W/BROWN STRIPE	N/A
GROUND	WHITE	N/A

* To switch between dual/quad mode or day/night mode, connect these wires to a switch. Connect the other side of the switch to ground.

** Department of Transportation System

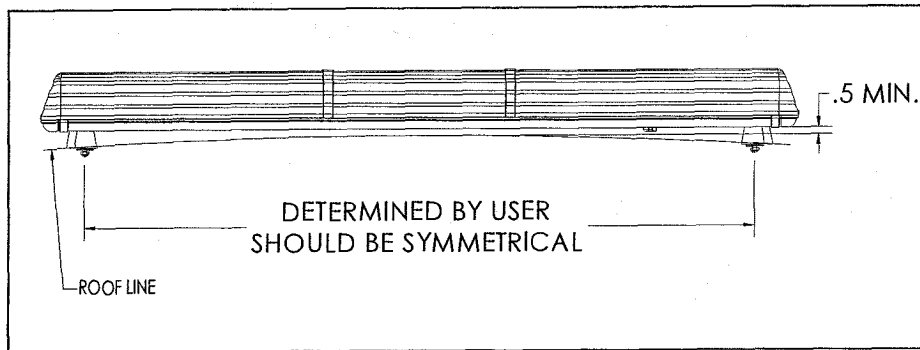


Figure 1

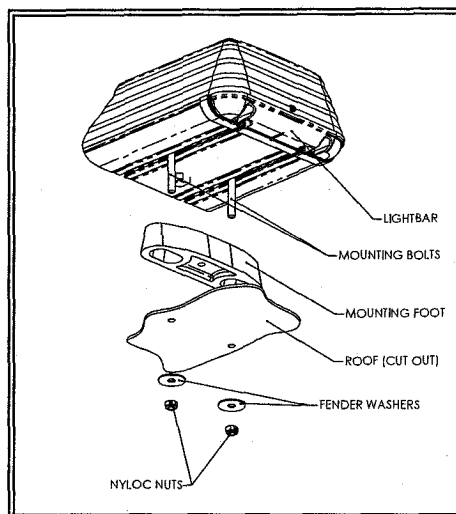


Figure 2

2. Position the light bar on the mounting feet. Be sure that the light bar is facing the proper direction. The cable from the light bar exits via a hole drilled in the drivers side of the light bar.
3. With the location determined, adjust the two mounting feet to a desired symmetrical location on the bar. Make sure that both mounting feet are in full contact with the roof and not hanging off the edge. Also, be sure that there is no less than $\frac{1}{2}$ " clearance between the roof and the light bar at their closest point (Fig. 1). When the feet have been placed in their desired location, mark the drilling hole locations. The center distance between the holes on each foot is 3.937 inches [100 mm].
4. Determine the routing plan for the cable. If it is to go through the roof of the vehicle, determine the location to be drilled.
5. Drill holes for mounting feet and cable. The mounting bolts are $\frac{5}{16}$ " diameter. Typical hole sizes for $\frac{5}{16}$ " bolt is a "P" (.3230") for a close fit or a "Q" (.3320") for a free fit. The cable is a .34" nominal diameter. The cable should be protected with a user-supplied grommet. The hole size drilled for the cable is dependent on the grommet selected. Silicone RTV can be used to seal the holes.
6. Insert the heads of the mounting bolts into the opening at the end of slots on the base of the light bar and place the rubber feet onto the bolts. These feet mount between the bottom of the light bar and the mounting surface.
7. Mount the light bar with the bolts through the holes drilled in step 5 above, and secure with the Fender washer and Nyloc nut as shown in Figure 2.
8. Wire the light bar (see the section on wiring).

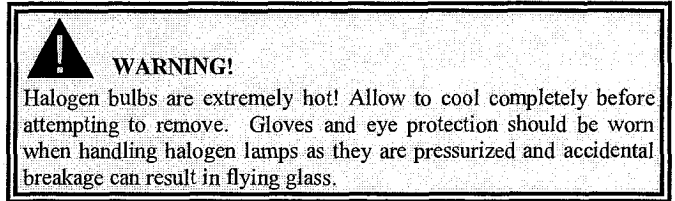
Wiring Instructions:

Notes:

1. Larger wires and tight connections will provide longer service life for components. For high current wires it is highly recommended that terminal blocks or soldered connections be used with shrink tubing to protect the connections. Do not use insulation displacement connectors (e.g., 3M Scotchlock type connectors).
2. Route wiring using grommets and sealant when passing through compartment walls. Minimize the number of splices to reduce voltage drop. High ambient temperatures (e.g., under-hood) will significantly reduce the current carrying capacity of wires, fuses, and circuit breakers. All wiring should conform to the minimum wire size and other recommendations of the manufacturer and be protected from moving parts and hot surfaces. Looms, grommets, cable ties, and similar installation hardware should be used to anchor and protect all wiring.
3. Fuses or circuit breakers should be located as close to the power takeoff points as possible and properly sized to protect the wiring and devices.
4. Particular attention should be paid to the location and method of making electrical connections and splices to protect these points from corrosion and loss of conductivity.
5. Ground termination should only be made to substantial chassis components, preferably directly to the vehicle battery.
6. Circuit breakers are very sensitive to high temperatures and will "false trip" when mounted in hot environments or operated close to their capacity.

Maintenance:

Do not oil or grease the rotators. They are constructed with permanently lubricated bearings. Clean the lens and base with soap and water, or a lens polish using a soft cloth.



Lens Removal & Replacement:

Lens removal and replacement is done starting at one end and working towards the other. Multiple section bars contain lenses that are separated by baffles. These baffles may require removal as well. The lens/baffle joint can be a very tight one. Significant force can be required to separate or join them. In some cases, the use of a soft, rubber mallet will be helpful. In all cases, use caution when applying force or pressure during this process.

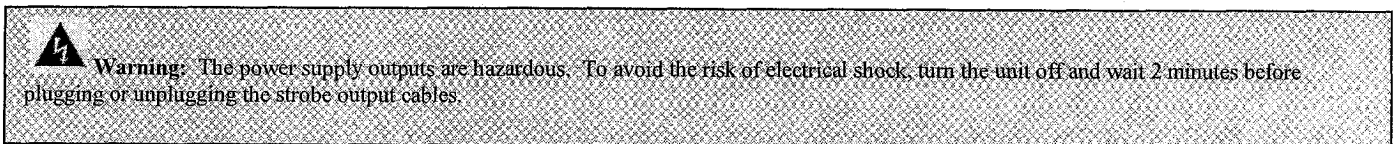
Removal:

1. Note the position of each lens section and baffle. On 5-section bars, this is particularly important.
2. Remove the #6-32 screws at each end of the bar. There will also be a lock washer with the screw.
3. Pull up on the end of the lens at the end of the bar, unseating the lens from the aluminum base.
4. Pull the lens until it separates from the baffle. An up and down motion will facilitate the separation.
5. If it is required to access the next section of the bar, remove the baffle using this procedure:
 - a. Slide the baffle along the aluminum base until it separates from the adjoining lens.
 - b. The baffles utilize a snap-in feature. To remove the baffle, squeeze the outer, contoured surface while pulling straight up.
6. Remove next lens by sliding it along the aluminum base and then up and away from the bar.
7. Repeat steps 4 - 6 as necessary to gain access to each successive section of the bar.

Replacement:

1. Refer to the position notes taken in step 1 above.
2. Starting at one end of the bar, place the end section lens in the bar. Be sure that the rubber seal along the aluminum base is in place. Verify the lens is seated in the track along the aluminum base and the end cap. Insert the #6-32 screw and lock-washer to secure the lens.
3. Position the baffle near the lens edge and press down firmly until it snaps in place. Verify that both retaining surfaces have latched securely inside the aluminum base.
4. Slide the baffle towards the lens until the lens and baffle seat. There will be approximately a 1/16" gap (when viewed from the outside of the baffle) between the end of the lens and the inside edge of the baffle.
5. Position the next lens near the baffle, ensuring it's seated in the aluminum base track. Slide the lens into the baffle until seated. The approximate 1/16" gap is appropriate here as well.
6. Repeat steps 4 and 5 as necessary.
7. Position the end lens section and seat it into the baffle. Push the lens down until it seats into the aluminum base track and end cap. Secure it with the #6-32 screw and lock-washer.
8. A final adjustment to the baffles may be necessary. They can be slid a slight amount along the aluminum base by tapping with a mallet.
9. Wipe the lenses clean with a soft, clean rag.

Bulb Replacement:



Consider changing all of a specific bulb type when one burns out. This will minimize removal and replacement of outer lenses.

Rotators:

1. With the rotator reflector facing the motor, use a pliers or screwdriver to remove the retaining clip. Take care not to lose the clip.
2. Slide the bulb and its holder toward the motor.
3. Grip both the bulb and holder and pull apart. Do not stress the wire.
4. Replace the bulb with a 12V, 55W H1 Halogen bulb (ECCO replacement p/n R5812BH). Do not touch the glass with bare hands.
5. Slide the bulb and holder back into position.
6. Replace the clip.
7. Verify the rotator will spin.
8. Power up, and test the system before replacing lenses.