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Safety First: This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely. Important information is contained herein that could prevent serious injury or damage.

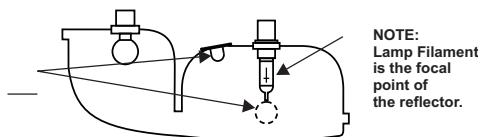
- Proper installation of this product requires the installer to have a good understanding of automotive electronics, systems and procedures.
- Whelen Engineering requires the use of waterproof butt splices and/or connectors if that connector could be exposed to moisture.
- Failure to use specified installation parts and/or hardware will void the product warranty!
- If mounting this product requires drilling holes, the installer MUST be sure that no vehicle components or other vital parts could be damaged by the drilling process. Check both sides of the mounting surface before drilling begins. Also de-burr any holes and remove any metal shards or remnants. Install grommets into all wire passage holes.
- Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owner's manual for the air bag deployment area. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.
- For this product to operate at optimum efficiency, a good electrical connection to chassis ground must be made. The recommended procedure requires the product ground wire to be connected directly to the NEGATIVE (-) battery post.
- If this product uses a remote device to activate or control this product, make sure that this control is located in an area that allows both the vehicle and the control to be operated safely in any driving condition.
- Do not attempt to activate or control this device in a hazardous driving situation.
- This product contains either strobe light(s), halogen light(s), high-intensity LEDs or a combination of these lights. Do not stare directly into these lights. Momentary blindness and/or eye damage could result.
- Use only soap and water to clean the outer lens. Use of other chemicals could result in premature lens cracking (crazing) and discoloration. Lenses in this condition have significantly reduced effectiveness and should be replaced immediately. Inspect and operate this product regularly to confirm its proper operation and mounting condition. Do not use a pressure washer to clean this product.
- **WARNING!** All customer supplied wires that connect to the positive (+) terminal of the battery must be sized to supply at least 125% of the maximum operating current and **FUSED** "at the battery" to carry that load. **DO NOT USE CIRCUIT BREAKERS WITH THIS PRODUCT!**
- **FAILURE TO FOLLOW THESE PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!**

Standard Mount (composite headlight or taillight housing) Installation:

1. Follow manufacturers instructions to remove the headlight (or taillight) reflector assembly from the vehicle.

Fig. 1

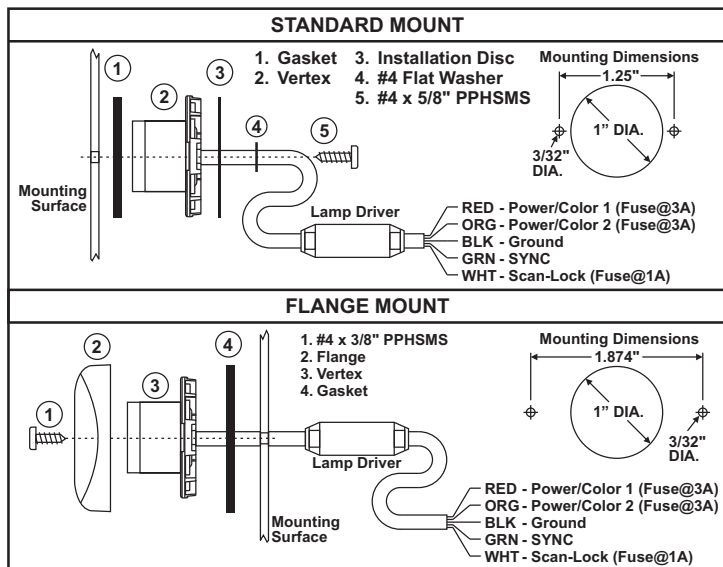
Insert the Vertex from the back or bottom of the headlight or rear taillight housing, as close to the focal point as possible.



Top view of automotive composite headlight or taillight housing.

2. Select the mounting location for the Vertex, keeping in mind the following:
 - The Vertex may share the same reflector as the headlight, brake light, or signal light. Make sure the Vertex does not interfere with the operation of these lights.
 - The Vertex must not be installed above the horizontal centerline of the reflector.
 - The Vertex must not be installed above any OEM-supplied light.
3. Choose a surface in the rear or bottom of the housing which is as flat as possible. Using a hole saw, cut a 1" hole in the housing as shown (Fig. 1 & 2) and de-burr the hole.
4. Insert the LED lamp assembly into the reflector housing. Mark the location for the two mounting holes (3/32" dia.). Remove the lamp assembly and drill the holes.
5. Install the lamp assembly and gasket using the #4 sheet metal screws, installation disc and flat washers as shown to secure the lamp to the reflector assembly. **WARNING! Over-tightening these screws could damage the Vertex™ and/or housing assembly. Do not continue to tighten once the Vertex is secured against the housing.**
7. Remount both headlight assemblies to the vehicle and route the connector cables to their designated control switches (power and Scan-Lock™).
8. The lamp driver should now be secured to the vehicle using the double-sided adhesive tape provided.

IMPORTANT NOTE: If the Vertex is being used in an area previously occupied by an S30HA light assembly, it is important to seal the mounting holes used by the previous assembly with RTV or other suitable material.



Flange Mount Installation:

Using the dimensions shown, drill appropriately sized wire access and mounting holes. Refer the "FLANGE MOUNT" illustration shown for proper assembly order and secure the Vertex using the hardware provided. Route the connector cables to their designated control switches (power and Scan-Lock™) and secure the lamp driver to the vehicle using the double-sided tape provided.

All customer supplied wires that connect to the positive terminal of the battery must be sized to supply at least 125% of the maximum operating current and **FUSED** at the battery to carry that load. **DO NOT USE CIRCUIT BREAKERS WITH THIS PRODUCT!**

Wiring & Operation:

- RED: Positive** - To a +12V power source (fuse @ 3 amps). **Suggested Switch:** SP/ST.
- ORANGE: Positive** - To +12V power source (fuse @ 3 amps). **Suggested Switch:** SP/ST.
- BLACK: Ground** - Extend to the negative terminal of the battery.
- GREEN: SYNC** - Connect to other SYNC capable devices to synchronize their output. Cap this wire if it is not used.
- WHITE: Scan-Lock™** - Extend the WHT wire to a customer supplied momentary switch (fuse @ 1 amp). See Scan-Lock section for operation. **Suggested Switch:** Normally Open Momentary Switch.

Scan-Lock

In order to program flash patterns, the lighthouse must be on:

TO CHANGE PATTERNS: To advance to the next available pattern apply +12VDC to the WHT wire for less than 1 second and release. To cycle back to the previous pattern apply +12VDC to the WHT wire for more than 1 second and release.

TO CHANGE THE DEFAULT PATTERN: When the desired pattern is displayed, allow it to run for more than 5 seconds. The lighthouse will now display this pattern when initially activated.

TO RESTORE THE FACTORY DEFAULT PATTERN: This will reset all patterns back to their default settings. With the light turned off, apply power to the WHT wire. With power applied to the WHT wire, turn light on. Allow the unit to run for 3 seconds before removing power from the WHT wire.

A normally open momentary switch should be used to control Scan-Lock operation.

Flash Patterns -

Note: The Dual-color Vertex has 3 individual flash pattern buffers; one for Color 1, one for Color 2 and one for Color 1 + 2. For example, when only Color 1 is activated, it can be configured to flash SignalAlert 75. When only Color 2 is activated, it can be configured to flash LongBurst. When Color 1 and Color 2 are simultaneously activated, they can be configured to flash ComAlert.

The following is a list of all the available flash patterns:

SYNC Patterns

- | | | | |
|--------------------|------|-------------------|------|
| 1. SignalAlert™ 75 | PH.1 | 8. SingleFlash 75 | PH.2 |
| 2. SignalAlert 75 | PH.2 | 9. ComAlert™ | PH.1 |
| 3. CometFlash@75 | PH.1 | 10. ComAlert | PH.2 |
| 4. CometFlash 75 | PH.2 | 11. LongBurst™ | PH.1 |
| 5. DoubleFlash 75 | PH.1 | 12. LongBurst | PH.2 |
| 6. DoubleFlash 75 | PH.2 | 13. PingPong™ | PH.1 |
| 7. SingleFlash 75 | PH.1 | 14. PingPong | PH.2 |

Non-SYNC Patterns

- | |
|---------------------|
| 15. SingleFlash 60 |
| 16. SingleFlash 90 |
| 17. SingleFlash 120 |
| 18. SingleFlash 300 |
| 19. DoubleFlash 150 |
| 20. ComAlert 150 |
| 21. ActionFlash™ 1 |
| 22. ActionFlash 2 |
| 23. ModuFlash™ |
| 24. ActionScan™ |
| 25. Steady |

Phase Operation

Phase 1 (PH.1) flashes **simultaneously** with PH.1
Phase 2 (PH.2) flashes **simultaneously** with PH.2
PH.1 alternates with PH.2

Waterproof butt splices and/or connectors are required if that connection could be exposed to moisture. Any unused wires must be sealed (waterproofed) to prevent moisture infiltration.

Warnings to Installers

Whelen's emergency vehicle warning devices must be properly mounted and wired in order to be effective and safe. Read and follow all of Whelen's written instructions when installing or using this device. Emergency vehicles are often operated under high speed stressful conditions which must be accounted for when installing all emergency warning devices. Controls should be placed within convenient reach of the operator so that he can operate the system without taking his eyes off the roadway. Emergency warning devices can require high electrical voltages and/or currents. Properly protect and use caution around live electrical connections. Grounding or shorting of electrical connections can cause high current arcing, which can cause personal injury and/or vehicle damage, including fire. Many electronic devices used in emergency vehicles can create or be affected by electromagnetic interference. Therefore, after installation of any electronic device it is necessary to test all electronic equipment simultaneously to insure that they operate free of interference from other components within the vehicle. Never power emergency warning equipment from the same circuit or share the same grounding circuit with radio communication equipment. All devices should be mounted in accordance with the manufacturer's instructions and securely fastened to vehicle elements of sufficient strength to withstand the forces applied to the device. Driver and/or passenger air bags (SRS) will affect the way equipment should be mounted. This device should be mounted by permanent installation and within the zones specified by the vehicle manufacturer, if any. Any device mounted in the deployment area of an air bag will damage or reduce the effectiveness of the air bag and may damage or dislodge the device. Installer must be sure that this device, its mounting hardware and electrical supply wiring does not interfere with the air bag or the SRS wiring or sensors. Mounting the unit inside the vehicle by a method other than permanent installation is not recommended as unit may become dislodged during swerving; sudden braking or collision. Failure to follow instructions can result in personal injury. Whelen assumes no liability for any loss resulting from the use of this warning device. **PROPER INSTALLATION COMBINED WITH OPERATOR TRAINING IN THE PROPER USE OF EMERGENCY WARNING DEVICES IS ESSENTIAL TO INSURE THE SAFETY OF EMERGENCY PERSONNEL AND THE PUBLIC.**

Warnings to Users

Whelen's emergency vehicle warning devices are intended to alert other operators and pedestrians to the presence and operation of emergency vehicles and personnel. However, the use of this or any other Whelen emergency warning device does not guarantee that you will have the right-of-way or that other drivers and pedestrians will properly heed an emergency warning signal. Never assume you have the right-of-way. It is your responsibility to proceed safely before entering an intersection, driving against traffic, responding at a high rate of speed, or walking on or around traffic lanes. Emergency vehicle warning devices should be tested on a daily basis to ensure that they operate properly. When in actual use, the operator must ensure that both visual and audible warnings are not blocked by vehicle components (i.e.: open trunks or compartment doors), people, vehicles, or other obstructions. It is the user's responsibility to understand and obey all laws regarding emergency warning devices. The user should be familiar with all applicable laws and regulations prior to the use of any emergency vehicle warning device. Whelen's audible warning devices are designed to project sound in a forward direction away from the vehicle occupants. However, because sustained periodic exposure to loud sounds can cause hearing loss, all audible warning devices should be installed and operated in accordance with the standards established by the National Fire Protection Association.