

WHELEN[®]

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Installation Guide:
Freedom™ IV HC Lightbar
Rota-Beam™ Series

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 they can operate the system without taking their 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.

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 the holes and remove any metal shards or remnants. Install grommets into all wire passage holes.**
- **If this manual states that this product may be mounted with suction cups, magnets, tape or Velcro®, clean the mounting surface with a 50/50 mix of isopropyl alcohol and water and dry thoroughly.**
- **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 (this does not include products that use cigar power cords).**
- **If this product uses a remote device for activation or control, make sure that this device is located in an area that allows both the vehicle and the device 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.**
- **It is recommended that these instructions be stored in a safe place and referred to when performing maintenance and/or reinstallation of this product.**
- **FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!**

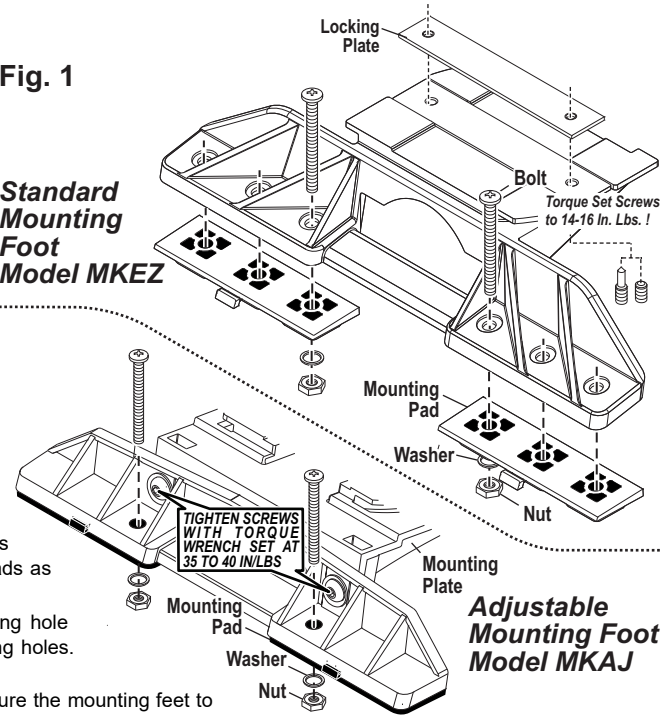
IMPORTANT! The lightbar must be a minimum of 16" from radio antennas!

Permanent Mounting:

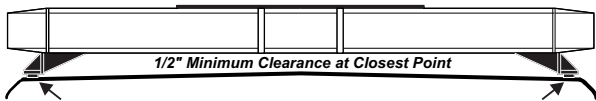
1. Locate the mounting foot and locking plate included with your lightbar. If not already present, install the locking plate onto the mounting foot using the supplied allen set screws (Fig. 1).
2. Flip the lightbar upside-down to expose the bottom of the extrusion. Place the mounting foot into the extrusion and rotate the foot so that the top of the foot swings into position under the lips in the extrusion (Figs. 2, 3 & 4). **NOTE: You only need the anchor plate shown in Figs. 2 - 4 for strap mounting.**
3. Repeat this procedure for the remaining mounting foot and return the lightbar to its right side-up position.
4. Position the lightbar onto the vehicle roof in the desired mounting location. One often selected location is directly above the B-pillars. This area is the strongest part of the roof. Check the light bar cable exit location to be sure that the lightbar is facing the proper direction.
5. Adjust the mounting feet outwards so that they are as close to the edge of the roof as possible (See below). When the mounting feet are properly positioned, lightly tighten the allen head set screws.
6. Turn the lightbar upside down and firmly tighten all of the mounting foot allen head set screws to 14-16 In.Lbs. (Fig.4). With the lightbar upside down, drill 2 holes into the mounting foot (for the mounting bolts) using the holes in the mounting pads as guides, in the location shown in figure 1.
7. Place the lightbar in its final mounting position on the vehicle, mark the mounting hole locations off onto the mounting surface, remove the lightbar and drill the mounting holes. You will need to lower the vehicle headliner (if present) for steps 7 & 8.
8. Place the lightbar back onto the vehicle lined up with the mounting holes and secure the mounting feet to the vehicle using the supplied hardware.

Fig. 1

Standard Mounting Foot Model MKEZ



Adjustable Mounting Foot Model MKAJ



IMPORTANT: Unless otherwise specified, the lightbar mounting feet must be sitting as close to the edge of the roof as possible. Mounting feet must also be in full contact with the roof and not be hanging off the edge. For strap mounted bars, the lightbar should be about the same width as the vehicle roof. If the lightbar is too large or small it will not mount properly to the vehicle and may shift or come loose during driving.

Fig. 2

Insert foot into extrusion with locking plate attached.

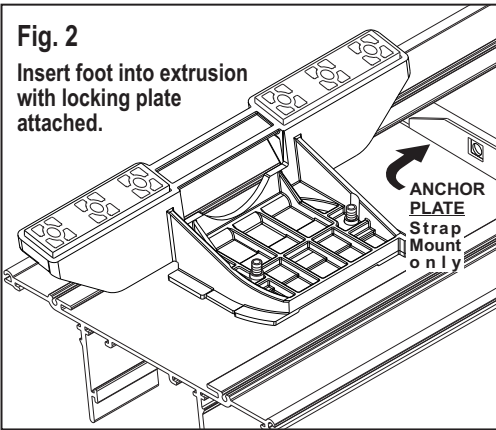


Fig. 3

Twist foot into position

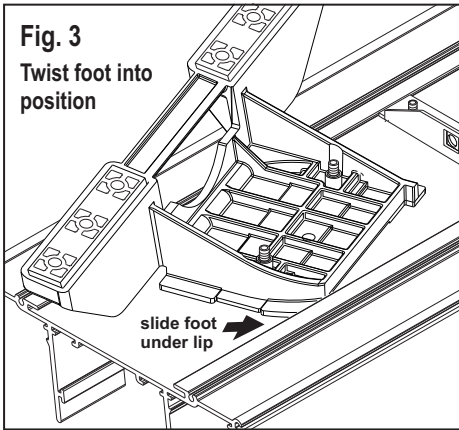


Fig. 4 Loosely secure foot and anchor plate.

Anchor plate helps hold mounting foot in place

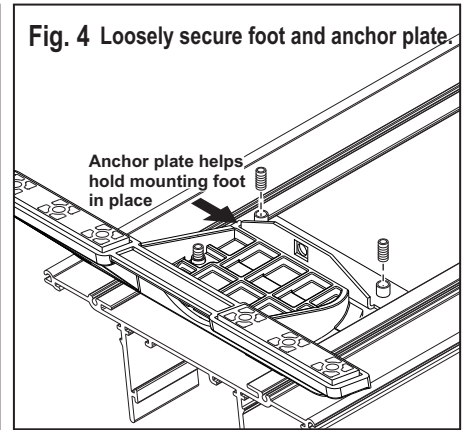
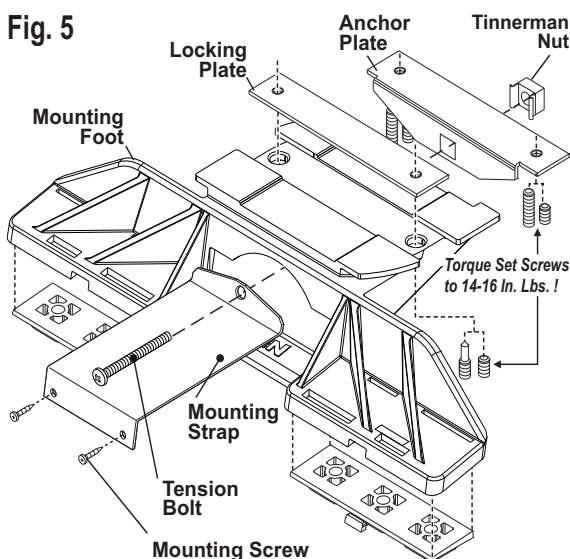


Fig. 5

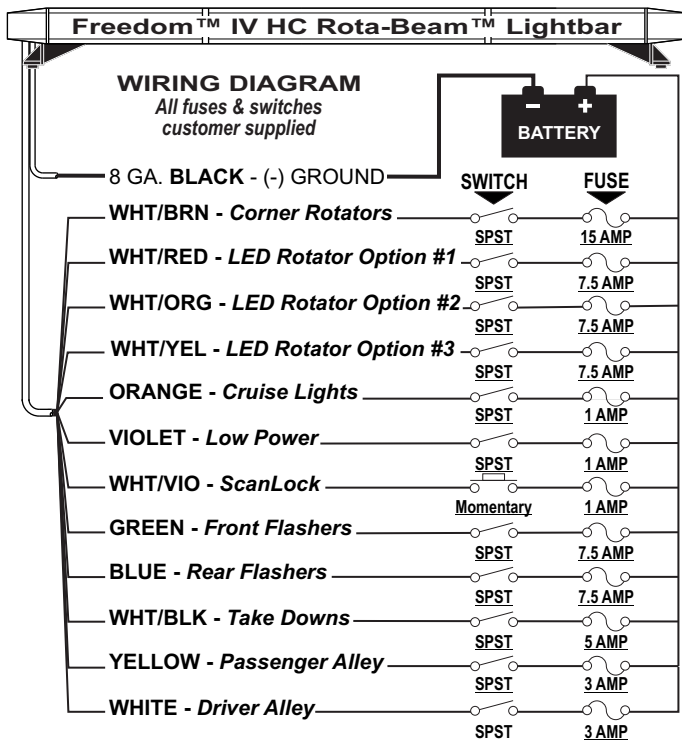


Strap Mounting:

1. Locate the mounting foot, anchor plate and locking plate. Loosely install the locking plate onto the mounting foot using the allen set screws (Fig. 5).
2. Flip the lightbar upside-down, install an anchor plate onto the extrusion and place a mounting foot onto the extrusion (Fig. 2). Rotate the foot 90° counter-clockwise (Fig. 3) so that both sides slide under the lip in the extrusion.
3. Repeat this procedure for the remaining mounting foot and return the lightbar to its right side-up position.
4. Position the lightbar on the vehicle roof and adjust the two mounting feet outwards so that the mounting pads are resting near the edge of the roof. When properly positioned, tighten the allen screws to hold them in place. Slide the anchor plates up to the mounting feet and tighten the allen screws securing the anchor plates. Tighten all Allen screws to 14-16 In.Lbs
5. Insert the mounting strap onto the mounting foot (Fig. 5). The strap must fit flush against the vehicle where it will be secured. Insert the tension bolt through the mounting strap and into the anchor plate. Tighten slightly with a long-shafted, Phillips screwdriver. Repeat procedure for other side of vehicle.
6. Use the holes in the end of the strap as a template to drill the pilot holes for the sheet metal screws through the strap and into the vehicle. Repeat for other side of vehicle.
7. Screw the sheet metal screws into the holes you drilled in step 6 and tighten firmly. Repeat for other side of the vehicle. Firmly tighten the tension bolt to secure the lightbar to the vehicle.

Wiring:

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!**



Control Cable Operation:

Wht/Vio: Scan-Lock™ (Fuse wire @ 1 AMP)

To change the flash pattern on any light, activate only that light.

TO CHANGE PATTERNS: To cycle forward to the next available pattern apply +VBAT to the WHITE-VIOLET wire for less than 1 second and release. To cycle back to the previous pattern apply +VBAT to the WHITE-VIOLET 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 light will now display this pattern when initially activated.

TO RESTORE THE FACTORY DEFAULT PATTERN: Turn power to the light off. While applying +VBAT to the WHITE-VIOLET wire, turn power to the light on. The factory default pattern is now displayed.

Use a Normally Open Momentary Switch for Scan-Lock™ operation. Scan-Lock is also used to select from four cruise light intensities.

Violet: Low Power (Fuse wire @ 1 AMP)

The type of switch used is dependant on how the operator wishes the Hi/Low feature to function:

Latching Mode: By applying +VBAT to the VIOLET wire for less than 1 sec., the power supply is "latched" into low power operation. The unit must be turned off and then back on to restore normal, Hi power operation. (Momentary Switch)

Level Mode: Applying +VBAT to the VIOLET wire for over 1 sec. holds the power supply in low power mode until voltage is removed. (Toggle Switch)

Wht/Brn: All Corner Rotators (Fuse wire @ 15 AMPS)

Applying +VBAT to the WHT/BRN wire activates Corner Rotators.

Wht/Red: LED Rotator Option #1 (Fuse wire @ 7.5 AMPS)

Applying +VBAT to the WHT/RED wire activates Option #1.

Wht/Org: LED Rotator Option #2 (Fuse wire @ 7.5 AMPS)

Applying +VBAT to the WHT/ORG wire activates Option #2.

White/Yellow: LED Rotator Option #3 (Fuse wire @ 7.5 AMPS)

Applying +VBAT to the WHT/YEL wire activates Option #3.

Orange: Cruise (Fuse wire @ 1 AMP)

Applying +VBAT to the ORG wire activates all four corner rotators at low intensity with no flash. Choose from four light intensities using ScanLock.

White: Driver Side Alley Light (Fuse wire @ 3 AMPS)

Applying +VBAT to the WHT wire activates Driver Side Alley.

Yellow: Passenger Side Alley Light (Fuse wire @ 3 AMPS)

Applying +VBAT to the YEL wire activates Passenger Side Alley

Wht/Blk: Take Downs (Fuse wire @ 5 AMPS)

Applying +VBAT to the WHT/BLK wire activates Take Downs.

Green: Front Flashers (Fuse wire @ 7.5 AMPS)

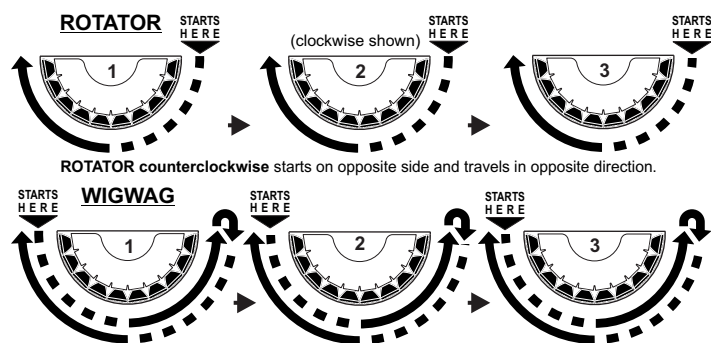
Applying +VBAT to the GREEN wire activates Front Flashers.

Blue: Rear Flashers (Fuse wire @ 7.5 AMPS)

Applying +VBAT to the BLUE wire activates Rear Flashers.

Ground Cable: Black: Ground Wire / Extend to ground.

Flash Patterns:



Flash Patterns - Corners

| # | PATTERN | DIRECTION |
|-----|--------------------|-----------|
| 1. | Rotator 75 | (C) |
| 2. | Rotator 75 | (CC) |
| 3. | Rotator 150 | (C) |
| 4. | Rotator 150 | (CC) |
| 5. | WigWag 75 | N/A |
| 6. | WigWag 150 | N/A |
| 7. | Center WigWag 75 | N/A |
| 8. | Center WigWag 150 | N/A |
| 9. | Rotator ModuFlash™ | (C) |
| 10. | Rotator ModuFlash™ | (CC) |

Flash Patterns - Center Rotator Options 1 2 & 3

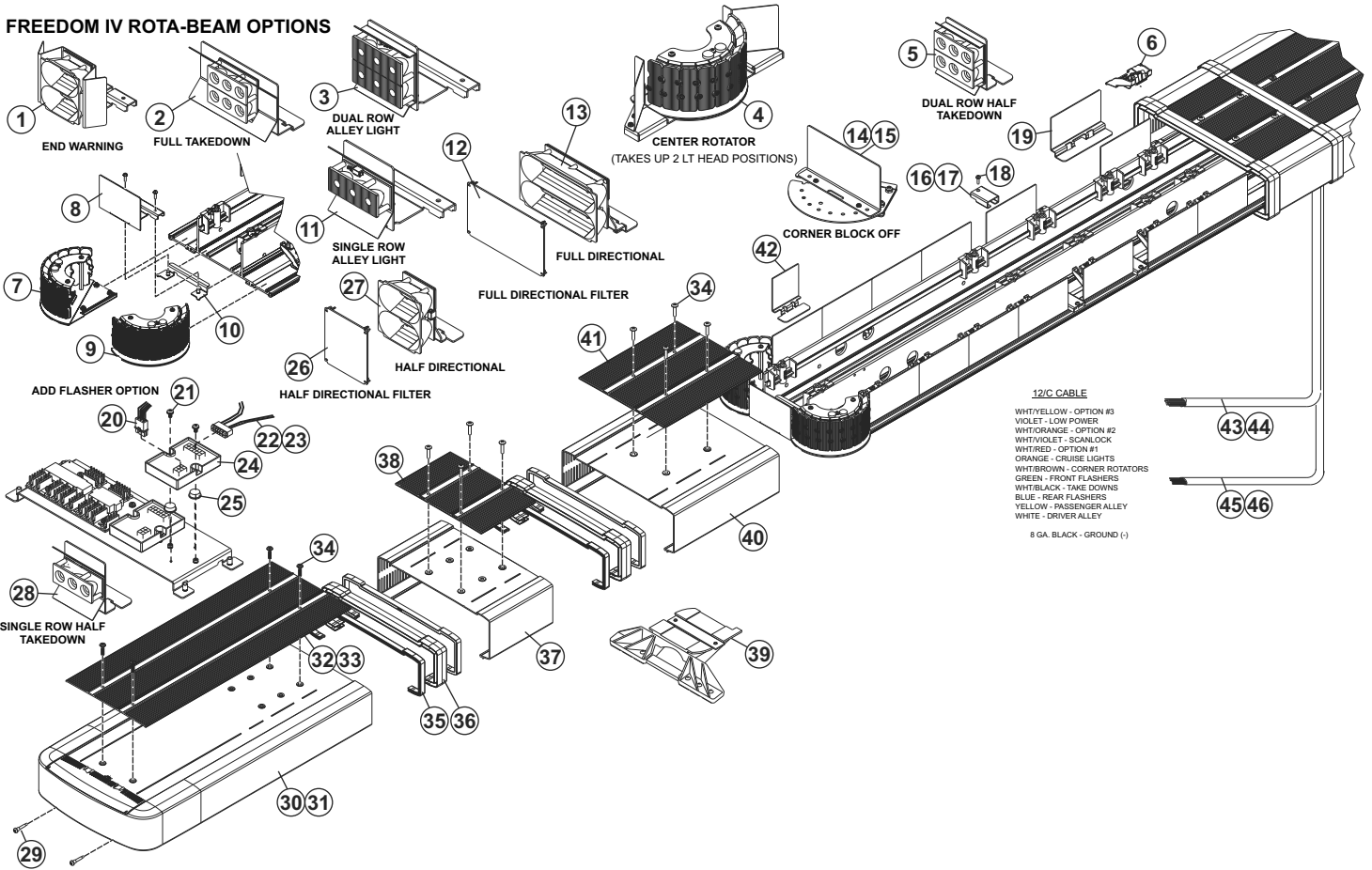
| | | |
|-----|-------------------------|-----|
| 1. | Rotator 75 (C) | PH1 |
| 2. | Rotator 75 (C) | PH2 |
| 3. | Rotator 75 (CC) | PH1 |
| 4. | Rotator 75 (CC) | PH2 |
| 5. | Rotator 150 (C) | PH1 |
| 6. | Rotator 150 (C) | PH2 |
| 7. | Rotator 150 (CC) | PH1 |
| 8. | Rotator 150 (CC) | PH2 |
| 9. | WigWag 75 | PH1 |
| 10. | WigWag 75 | PH2 |
| 11. | WigWag 150 | PH1 |
| 12. | WigWag 150 | PH2 |
| 13. | Rotator ModuFlash™ (C) | PH1 |
| 14. | Rotator ModuFlash™ (CC) | PH1 |

Flash Patterns - Flasher Option

| | |
|-----|-------------------------------|
| 1. | SignalAlert ALTERNATING |
| 2. | SignalAlert ALTERNATING ASYNC |
| 3. | SignalAlert IN/OUT |
| 4. | SignalAlert CHECKERBOARD |
| 5. | CometFlash@ |
| 6. | DoubleFlash 75 ALTERNATING |
| 7. | DoubleFlash 75 ALT. ASYNC |
| 8. | DoubleFlash 75 IN/OUT |
| 9. | DoubleFlash 75 CHECKERBOARD |
| 10. | SingleFlash 75 ALTERNATING |
| 11. | SingleFlash 75 ALT. ASYNC |
| 12. | SingleFlash 75 IN/OUT |
| 13. | SingleFlash 75 CHECKERBD. |
| 14. | LongBurst |
| 15. | SingleFlash 60 |
| 16. | SingleFlash 90 |
| 17. | SingleFlash 120 |
| 18. | SingleFlash 240 |
| 19. | MicroBurst |
| 20. | ActionFlash |
| 21. | PingPong |
| 22. | FlimFlam |
| 23. | ModuFlash |
| 24. | ZigZag* |

(C) = Clockwise (CC) = Counter Clockwise PH1 = Phase 1 PH2 = Phase 2

FREEDOM IV ROTA-BEAM OPTIONS



| QTY | QTY | QTY | QTY | QTY | ITEM | PART NUMBER | DESCRIPTION |
|-----|-----|-----|-----|-----|------|---------------|--|
| | | | * | | | 01-0688067-00 | 55° FREEDOM IV (HC) ROTA-BEAM |
| | | | * | | | 01-0688067-01 | 60° FREEDOM IV (HC) ROTA-BEAM |
| | | * | | | | 01-0688067-02 | 72° FREEDOM IV (HC) ROTA-BEAM |
| | * | | | | | 01-0688067-03 | 81° FREEDOM IV (HC) ROTA-BEAM |
| * | | | | | | 01-0688067-04 | 91° FREEDOM IV (HC) ROTA-BEAM |
| A/R | A/R | A/R | A/R | A/R | 1 | 01-026G538-** | SUB ASSY, HALF END LINEAR FREEDOM IV ROTA-BEAM |
| A/R | A/R | A/R | A/R | A/R | 2 | 01-026F778-30 | SUB ASSY, 6LED TIR FULL T-D LT FREEDOM IV XQ-E |
| A/R | A/R | A/R | A/R | A/R | 3 | 01-026F855-30 | SUB ASSY, 6TIR ALLEY LIGHT FREEDOM IV XQ-E |
| A/R | A/R | A/R | A/R | A/R | 4 | 01-0287748-** | ASSY, INBOARD ROTA-BEAM FREEDOM IV |
| - | - | - | - | A/R | 5 | 01-026F857-30 | SUB ASSY, 6LED TIR HALF T-D LT FREEDOM IV XQ-E |
| 32 | 28 | 24 | 20 | 20 | 6 | 07-26F382-000 | BRCKT, SNAP-IN LT MODULE MT FREEDOM REDESIGN |
| 2 | 2 | 2 | 2 | 2 | 7 | 01-0287750-** | CORNER L-FRONT/R-REAR FREEDOM IV ROTA-BEAM |
| 2 | 2 | 2 | 2 | 2 | 8 | 07-26G487-000 | BRCKT, ALLEY BLOCK-OFF FREEDOM IV ROTA-BEAM |
| 2 | 2 | 2 | 2 | 2 | 9 | 01-0287751-** | CORNER R-FRONT/L-REAR FREEDOM IV ROTA-BEAM |
| 2 | 2 | 2 | 2 | 2 | 10 | 07-247398-000 | BRCKT, STAND ALONE MT ALLEY FREEDOM IV |
| A/R | A/R | A/R | A/R | A/R | 11 | 01-0247247-30 | SUB ASSY, 3LED TIR ALLEY LT FREEDOM IV |
| A/R | A/R | A/R | A/R | A/R | 12 | 68-396F391-*0 | LENS, FULL LINEAR FILT. NON OPTIC FREEDOM IV |
| A/R | A/R | A/R | A/R | A/R | 13 | 01-026F728-** | SUB ASSY, FULL LINEAR FREEDOM IV |
| A/R | A/R | A/R | A/R | A/R | 14 | 02-0347583-00 | BLOCK OFF CORNER LF/RR FREEDOM IV ROTA-BEAM |
| A/R | A/R | A/R | A/R | A/R | 15 | 02-0347583-01 | BLOCK OFF CORNER RF/LR FREEDOM IV ROTA-BEAM |
| - | - | 8 | - | 4 | 16 | 07-223841-000 | BRACKET, SPACER LEGACY LTBAR |
| 12 | 8 | - | 4 | - | 17 | 07-226279-000 | BRACKET, FILLER 1.400" FREEDOM IV |
| 20 | 16 | 16 | 12 | 12 | 18 | 14-062216-081 | SCREW, 6-32 X 1/2 PPHMS SEMS W/IT LOCK WASHER 410 SS |
| 32 | 28 | 24 | 20 | 16 | 19 | 07-247576-000 | BRCKT, FULL FILLER PANEL ROTATOR FREEDOM IV |
| A/R | A/R | A/R | A/R | A/R | 20 | 46-0787428-02 | HARNES FLASHER HC DELTA ROTA-BEAM |

| | | | | | | | |
|-----|-----|-----|-----|-----|----|---------------|---|
| A/R | A/R | A/R | A/R | A/R | 21 | 14-062216-041 | SCREW, 6-32 X 1/4 PPHMS SEMS W/IT LOCK WASHER |
| - | - | A/R | A/R | A/R | 22 | 46-076G549-00 | HARNES FLASHER OUTPUT FREEDOM IV ROTA-BEAM |
| A/R | A/R | - | - | - | 23 | 46-076G549-01 | HARNES FLASHER OUTPUT EXT LG FREEDOM IV ROTA-BEAM |
| A/R | A/R | A/R | A/R | A/R | 24 | 01-026A213-05 | ELECT FLASHER ROTATOR DELTA |
| A/R | A/R | A/R | A/R | A/R | 25 | 08-0617529-00 | RUBBER BUMPER, 400" DIA. 125" HGT |
| - | - | - | - | A/R | 26 | 68-3947120-_0 | LENS, HALF LINEAR FILT. NON OPTIC FREEDOM IV |
| - | - | - | - | A/R | 27 | 01-026F729-__ | SUB ASSY, HALF LINEAR FREEDOM IV |
| - | - | - | - | A/R | 28 | 01-0247246-30 | SUB ASSY, 3LED TIR HALF T-D LT FREEDOM IV |
| 4 | 4 | 4 | 4 | 4 | 29 | 14-104286-16J | SCREW, 10-24 X 1.25" WAX DIP SHOULDER PHTX TRI POINT SS |
| - | - | - | - | 2 | 30 | 02-036F779130 | SUB ASSY, LENS CUT CLEAR GREY FREEDOM IV |
| 2 | 2 | 2 | 2 | - | 31 | 02-036F779-30 | SUB ASSY, LENS FULL CLEAR GREY FREEDOM IV |
| - | - | - | - | 2 | 32 | 11-26E056-119 | CR, TOP EXTRD 19.275", 15.611" HOLES FREEDOM |
| 2 | 2 | 2 | 2 | - | 33 | 11-26E056-021 | COVER, TOP EXTRD 21.665", 17.625" HOLES LEGACY |
| 24 | 20 | 16 | 12 | 12 | 34 | 15-105C76-148 | SCREW, 10 X 7/8 T-25 TORX TRUSS HD PLASTI-LOC SS W/INSEAL |
| 12 | 8 | 8 | 4 | 4 | 35 | 38-046F226-00 | SEAL, LENS DIVIDER FREEDOM IV |
| 6 | 4 | 4 | 2 | 2 | 36 | 38-046F227-00 | DIVIDER, LENS FREEDOM IV |
| 2 | - | 2 | - | - | 37 | 68-196F612-30 | LENS, CLEAR OPTIC 1-LT CENTER FREEDOM IV |
| 1 | 1 | 1 | 1 | 1 | 39 | 02-0342982-00 | SUB ASSY, MTG FOOT AND PADS ROTINSTALL |
| 3 | 3 | 1 | 1 | 1 | 40 | 68-196F602-30 | LENS, CLEAR OPTIC 2-LT CENTER FREEDOM IV |
| 3 | 3 | 1 | 1 | 1 | 41 | 11-26E377-009 | COVER, TOP EXTRD CENTER LEGACY LTBAR |
| - | - | - | - | 4 | 42 | 07-247592-000 | BRCKT, HALF FILLER PANEL ROTATOR FREEDOM IV |
| - | - | - | 1 | 1 | 43 | 46-0746850-00 | ASSY, CABLE INPUT 20' DELTA ROTATOR LIGHTBAR |
| 1 | 1 | 1 | - | - | 44 | 46-0746850-01 | ASSY, CABLE INPUT 25' DELTA ROTATOR LIGHTBAR |
| - | - | - | 1 | 1 | 45 | 67-1N00800M00 | WIRE, 8 GA 20' BLACK 5952-BK CONTACT/STRIP 3/16 |
| 1 | 1 | 1 | - | - | 46 | 67-1N00800R00 | WIRE, 8 GA 25' BLACK 5952-BK CONTACT/STRIP 3/16 |