

WHELEN[®]

ENGINEERING COMPANY INC.

51 Winthrop Road
Chester, Connecticut 06412-0684
Phone: (860) 526-9504
Internet: www.whelen.com
Sales e-mail: autosale@whelen.com
Customer Service e-mail: custserv@whelen.com

Installation Guide: Freedom IV[®] Mini Lightbar

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.

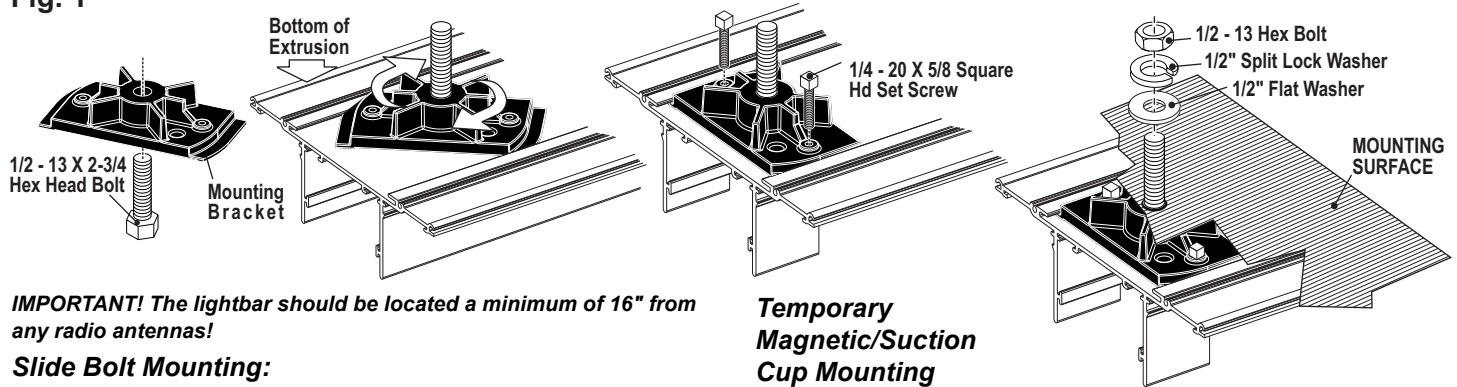
Safety First

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.

⚠ WARNING: This product can expose you to chemicals including Methylene Chloride which is known to the State of California to cause cancer, and Bisphenol A, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

- **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.**
- **Any holes, either created or utilized by this product, should be made both air- and watertight using a sealant recommended by your vehicle manufacturer.**
- **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!**

Fig. 1



IMPORTANT! The lightbar should be located a minimum of 16" from any radio antennas!

Slide Bolt Mounting:

1. Insert the two supplied 1/2 - 13 X 2-3/4 HEX HD BOLTS into the slide bolt brackets and twist the two brackets into the bottom of the lightbar extrusion (Fig. 1).
2. With the slide bolt brackets in their mounting position, secure them to the lightbar with the supplied set screws.
3. Position the lightbar onto the vehicle and mark the location of the two mounting bolts off onto the mounting surface.
4. Remove the lightbar and drill the two mounting holes you marked off using a 1/2" drill bit.
5. Secure the lightbar to the mounting surface with the supplied mounting hardware.
6. Extend wires to your switch panel and refer to the wiring diagram. Refer to the instructions included with your switches for switch wiring.

Temporary Magnetic/Suction Cup Mounting

The magnetic/suction cup should be mounted on a flat part of the roof.

Magnetic/suction: Thoroughly clean the proposed mounting surface prior to mounting. Wipe the suction cup clean, place the beacon onto its mounting surface and apply gentle pressure to ensure a good seal has been achieved.

WARNING! The use of any magnetically mounted warning device on the outside of a vehicle in motion is not recommended and is the sole risk and responsibility of the user.

IMPORTANT! It is the responsibility of the installation technician to make sure that the installation and operation of this product will not interfere with or compromise the operation or efficiency of any vehicle equipment! Before returning the vehicle to active service, visually confirm the proper operation of this product, as well as all vehicle components/equipment.

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 do not need the anchor plate shown in Figs. 2 - 4. This is used in 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 (Cable exits in rear).
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 (Fig.4) to 14-16 In. Lbs. 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.

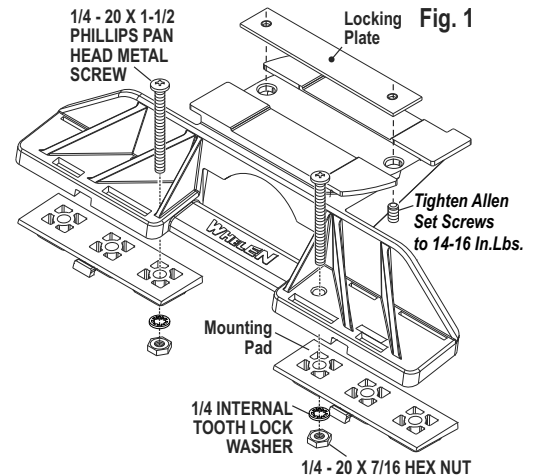


Fig. 2

Insert foot into extrusion with locking plate attached.

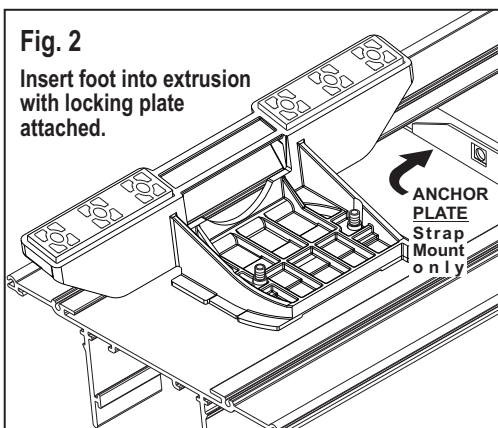


Fig. 3

Twist foot into position

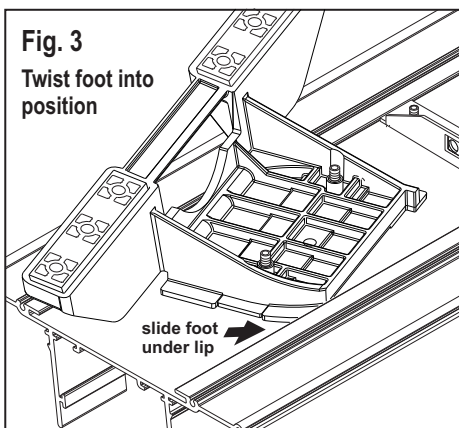
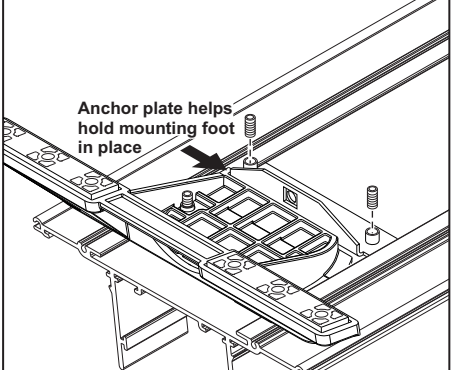
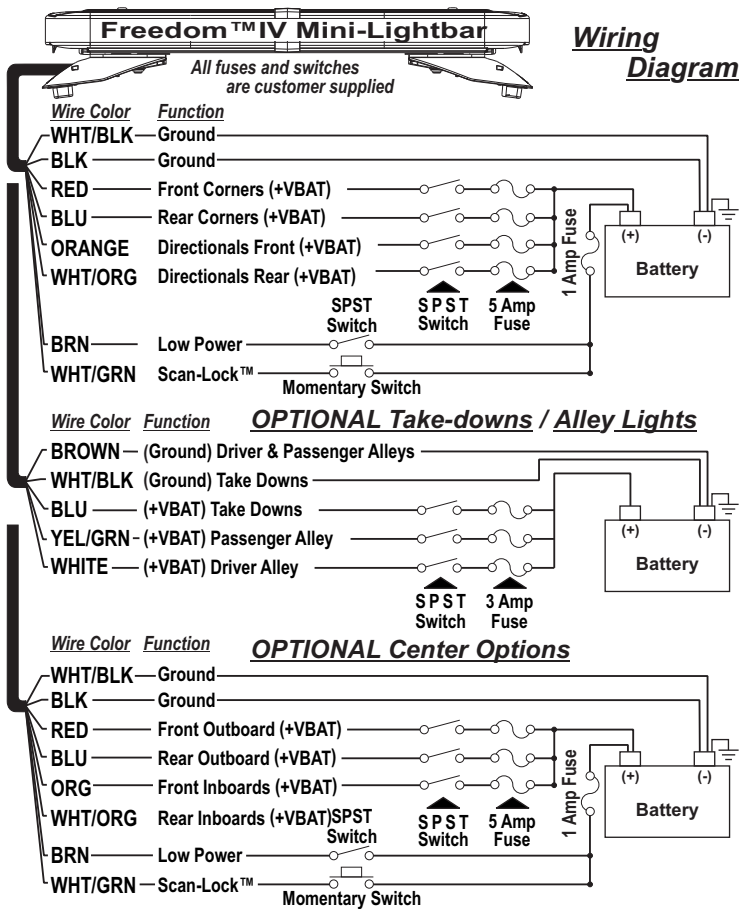


Fig. 4 Loosely secure foot and anchor plate





FLASH PATTERNS:

- | | | |
|------------------------------|-------------------------------|-------------------------------|
| 1. SignalAlert™ L/R SYNC | 24. LongBurst™ SIM | 48. SingleFlash 120 STDY RT |
| 2. SignalAlert™ L/R ASYNC | 25. LongBurst™ ALT/SIM | 49. SingleFlash 120 STDY BOTH |
| 3. SignalAlert™ IN/OUT | 26. SingleFlash 60 L/R SYNC | 50. SingleFlash 240 L/R SYNC |
| 4. SignalAlert™ SIM | 27. SingleFlash 60 L/R ASYNC | 51. SingleFlash 240 L/R ASYNC |
| 5. SignalAlert™ ALT/SIM | 28. SingleFlash 60 IN/OUT | 52. SingleFlash 240 IN/OUT |
| 6. CometFlash® L/R SYNC | 29. SingleFlash 60 SIM | 53. SingleFlash 240 SIM |
| 7. CometFlash® L/R ASYNC | 30. SingleFlash 60 ALT/SIM | 54. SingleFlash 240 ALT/SIM |
| 8. CometFlash® IN/OUT | 31. SingleFlash 60 STDY LEFT | 55. ActionFlash™ L/R SYNC |
| 9. CometFlash® SIM | 32. SingleFlash 60 STDY RT | 56. ActionFlash™ L/R ASYNC |
| 10. CometFlash® ALT/SIM | 33. SingleFlash 60 STDY BOTH | 57. ActionFlash™ IN/OUT |
| 11. DoubleFlash 75 L/R SYNC | 34. SingleFlash 90 L/R SYNC | 58. ActionFlash™ SIM |
| 12. DoubleFlash 75 L/R ASYNC | 35. SingleFlash 90 L/R ASYNC | 59. PingPong™ L/R SYNC |
| 13. DoubleFlash 75 IN/OUT | 36. SingleFlash 90 IN/OUT | 60. PingPong™ L/R ASYNC |
| 14. DoubleFlash 75 SIM | 37. SingleFlash 90 SIM | 61. PingPong™ IN/OUT |
| 15. DoubleFlash 75 ALT/SIM | 38. SingleFlash 90 ALT/SIM | 62. PingPong™ SIM |
| 16. SingleFlash 75 L/R SYNC | 39. SingleFlash 90 STDY LEFT | 63. ModuFlash™ L/R SYNC |
| 17. SingleFlash 75 L/R ASYNC | 40. SingleFlash 90 STDY RT | 64. ModuFlash™ L/R ASYNC |
| 18. SingleFlash 75 IN / OUT | 41. SingleFlash 90 STDY BOTH | 65. ModuFlash™ IN/OUT |
| 19. SingleFlash 75 SIM | 42. SingleFlash 120 L/R SYNC | 66. ModuFlash™ SIM |
| 20. SingleFlash 75 ALT/SIM | 43. SingleFlash 120 L/R ASYNC | 67. ActionScan™ |
| 21. LongBurst™ L/R SYNC | 44. SingleFlash 120 IN/OUT | |
| 22. LongBurst™ L/R ASYNC | 45. SingleFlash 120 SIM | |
| 23. LongBurst™ IN/OUT | 46. SingleFlash 120 ALT/SIM | |
| | 47. SingleFlash 120 STDY LEFT | |

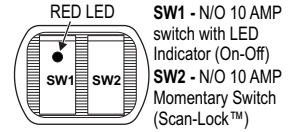
L/R SYNC = LEFT / RIGHT SYNCHRONOUS
 L/R ASYNC = LEFT / RIGHT ASYNCHRONOUS
 SIM = SIMULTANEOUS
 IN/OUT = IN / OUT

STDY LEFT = STEADY LEFT
 STDY RT = STEADY RIGHT
 STDY BOTH = STEADY BOTH
 ALT/SIM = ALTERNATING SIMULTANEOUS

Wiring and Operation:

Extend the control cable to your switch panel and make connections. The control cable connects to your control head or switch box and is fused there. Applying +VBAT to a control wire will activate its function. BLACK and WHT/BLK are ground wires. (Optional Alley/Take-down cable not included with standard model also shown). **Cigar Plug:** In models that feature a cigar plug, you can control Scan-Lock pattern selection and Power with the 2 switches located on the top of the plug.

Cigar Cord Switch



RED / Front Corners:

Apply +VBAT to the RED wire to activate the *Front Corner* lights.

BLUE / Rear Corners:

Apply +VBAT to the BLUE wire to activate the *Rear Corner* lights.

ORANGE / Front Directional Lights:

Apply +VBAT to ORG wire to activate the *Front Directional* lights.

WHT/ORG / Rear Directional Lights:

Apply +VBAT to ORG wire to activate the *Rear Directional* lights.

BROWN / Low Power:

The switch type used depends on how you wish *Low Power* to function:

Latching Mode: Apply +VBAT to the BROWN wire for less than 1 sec. to "latch" the lightbar into *Low Power*. The unit must be turned off and then back on to restore normal operation. (Momentary Switch)

Level Mode: Apply +VBAT to the BROWN wire for over 1 sec. to hold the lightbar in *Low Power* until voltage is removed. (Toggle Switch)

Warning Alley Lights:

- If your lightbar is equipped with Front Directional Lights only (No Rear Directional Lights) the WHT/ORG wire will activate Warning Alley lights.
- If your lightbar is equipped with Rear Directional Lights only (No Front Directional Lights) the ORG wire will activate Alley Lights.

WHITE-GREEN / Scan-Lock™:

The WHT/GRN wire allows you to choose from available flash patterns. You must activate the function to select a pattern:

TO CYCLE THROUGH ALL PATTERNS:

To cycle forward apply +VBAT to the WHT/GRN wire for less than 1 second and release.

To cycle backward apply +VBAT to the WHT/GRN wire for more than 1 second and release.

TO SET A PATTERN AS DEFAULT:

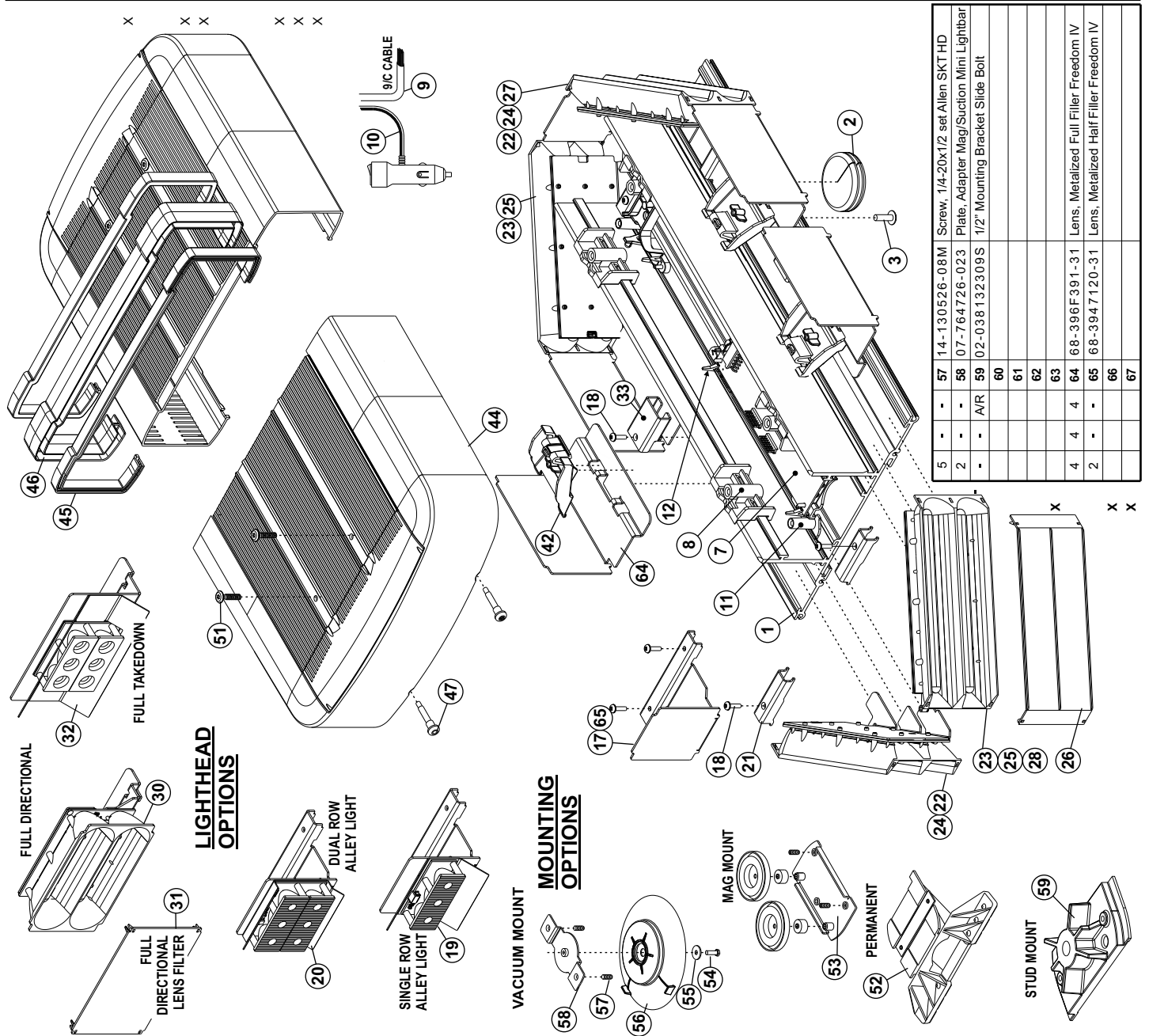
When the pattern is displayed, allow it to run for more than 5 seconds. The lightbar will now display this pattern when activated.

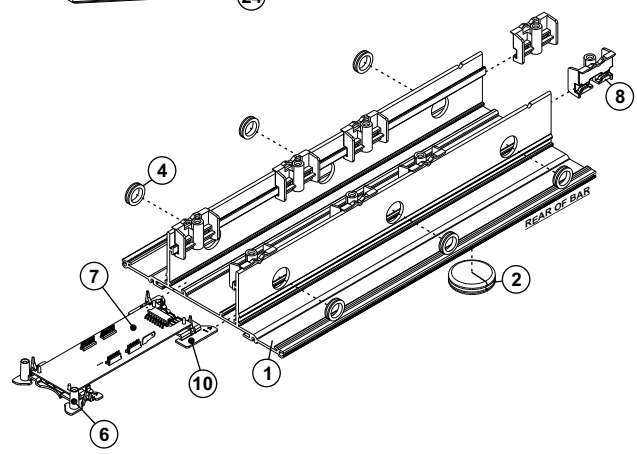
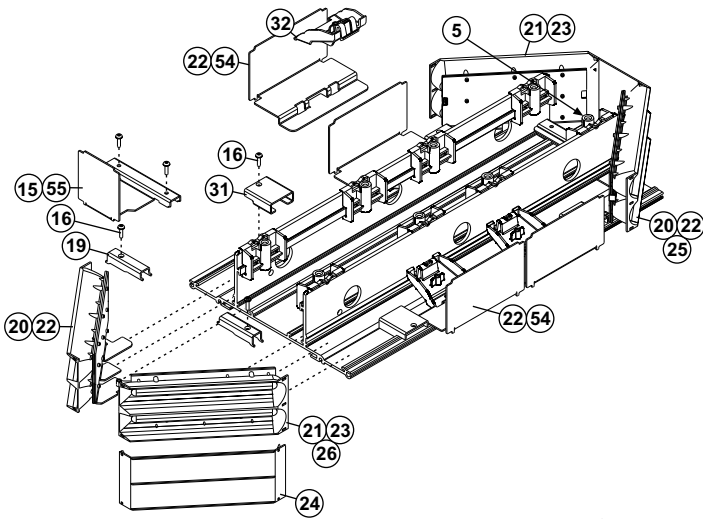
TO RESET TO THE FACTORY DEFAULT PATTERN:

With power off, apply +VBAT to WHT/GRN wire while turning power on.

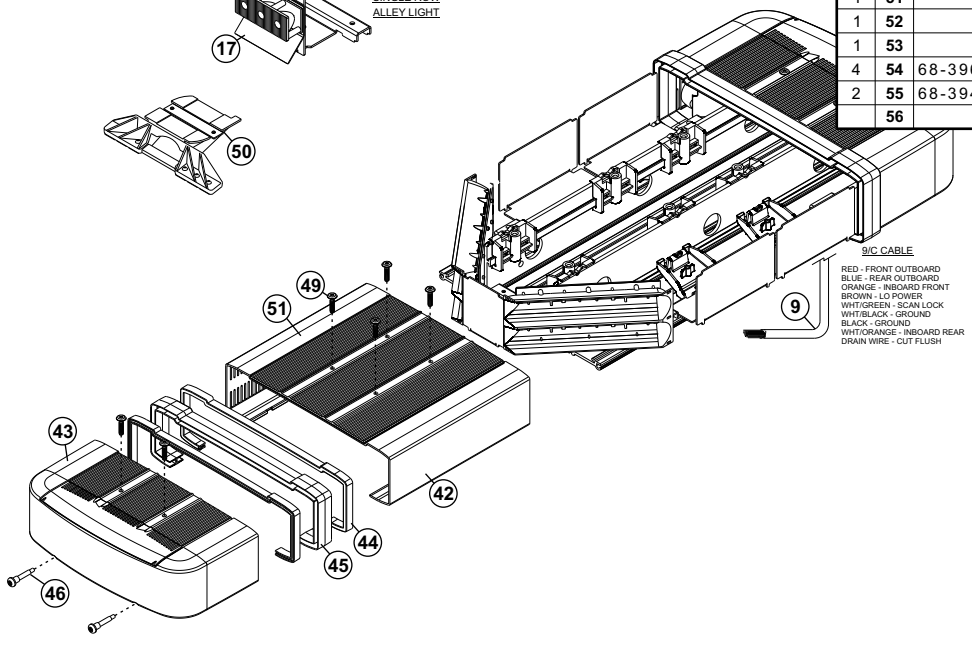
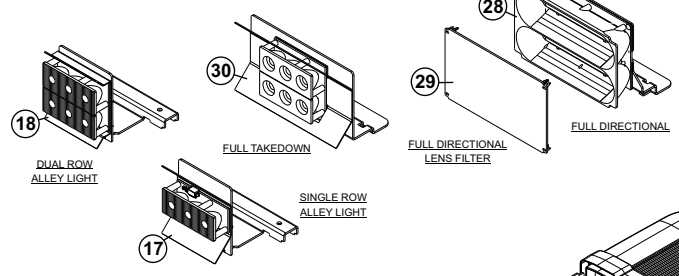
Use a normally open momentary switch for Scan-Lock operation.

QTY	QTY	ITEM	PART NUMBER	DESCRIPTION
*	*		01-0687897-00	FREEDOM IV MINI LIGHTBAR, PERM MT
*	*		01-0687897-00	FREEDOM IV MINI LIGHTBAR, MAGNETIC MT
*	*		01-0687897-00	FREEDOM IV MINI LIGHTBAR, VACUUM MT
1	1	1	11-387899-016	BASE, EXTRUDED MACHINED 1/64" FREEDOM IV MINI
1	1	2	21-11245004-1	Grommet, Special 1.562" DIA
1	1	3	38-0123557-00	Grommet, 50" DIA
2	2	4	21-11263204-0	Grommet, 1" Slim Line
1	1	5	07-26D863-000	Bracket, Bulkhead Lens Mount
1	1	6	02-016H602-01	I/O Board Mini SOLO 12/24V Cig. Plug
4	4	8	07-26F288-000	Bracket, Lens Mount Freedom IV
-	-	9	46-0743403-00	Cable 9/C 18 GA TPR 20'
1	1	10	02-0243700-03	Cigar Cord w/8 POS SL-156
1	1	11	07-26J382-000	Bracket, I/O Legacy/Freedom IV
1	1	12	07-26J582-000	Bracket, I/O Inner Legacy/Freedom IV
1	1	13	46-0742938-07	Cable 5/C 18 GA TPR 20'
1	1	15	26-0215001-06	TV Wrap, 6"
-	-	16	39-1M17672-08	Housing, Plug 8 POS 18 GA
2	2	17	07-26F833-000	Bracket, Filler Alley Position, Freedom IV
10	10	18	14-062216-081	Screw, 6-32 x 1/2 PPHMS SEMS Lk Wsh
-	-	19	01-02247247-3	3LED TIR Alley Light, Freedom IV
-	-	20	01-026F855-3	6TIR Alley Light, Freedom IV
4	4	21	19-147132-000	Retainer, Corner Linear, Freedom IV
2	2	22	01-026F826	Corner L-FIR, Rr 12LED Freedom IV
2	2	23	01-026F827	Corner R-FIL, Rr 12LED Freedom IV
A/R	A/R	24	01-026F758	Corner L-FIR, Rr 18LED Freedom IV
A/R	A/R	25	01-026F759	Corner R-FIL, Rr 18LED Freedom IV
A/R	A/R	26	68-396F390-0	Lens, Cmr Filter Non-Optic Freedom IV
A/R	A/R	27	02-036G163-00	Blank, Pass Rear Corner, Freedom IV
A/R	A/R	28	02-036G164-00	Blank, Driver Rear Corner, Freedom IV
4	4	29	07-247177-000	Bracket, Full Filler Freedom IV
A/R	A/R	30	01-026F728	Full Linear Freedom IV
A/R	A/R	31	68-396F391-0	Lens, Linear Filler Non-Optic Freedom IV
-	-	32	01-026F778-3	6LED TIR Full T-D Li Freedom IV
2	2	33	07-223841-000	Bracket, Filler Legacy Lightbar
1	1	34	46-0787707-00	Harness, J1 Mini Legacy
1	1	35	46-0787707-01	Harness, J6 Mini Legacy
1	1	36	46-0787707-02	Harness, J2 Mini Legacy
1	1	37	46-0787707-03	Harness, J5 Mini Legacy
-	-	38	39-0402023-04	Heng, 2-Pos Socket Comm Mate-N-Lok
-	-	39	39-0403023-04	Heng, 3-Pos Socket Comm Mate-N-Lok
-	-	40	46-0787732-01	Legacy Mini, Alley Harness
-	-	41	46-0787732-00	Legacy Mini, Takehorn Harness
4	4	42	07-26F382-000	Bracket, Snap-In LT Module MT
A/R	A/R	43	02-036F7792-0	Sub Assy, Lens Out, Mini Freedom IV
2	2	44	38-046F226-00	Seal, Lens Divider Freedom IV
2	2	45	38-046F227-00	Divider, Lens Freedom IV
1	1	46	14-104286-16J	Screw, 10-24 x 1.25 Shldr PHTX Tri-Pnt
4	4	48	66-0444378-00	Tape, VHB Endcap Trim Mount
2	2	50	11-26G144-008	Cover, Top 22" Mini Freedom IV
4	4	51	15-105C76-148	Screw, 10x7/8 T25 TX Truss HD
-	-	52	02-0483969007	Opt. 7 Mounting, RTTNL, Install
-	-	53	02-036A935-00	Magnet Mount, Justice Mini
2	2	54	1/4-20 x 3/4 Hex Head MS SS	Screw, 1/4-20 x 3/4 Hex Head MS SS
2	2	55	16-1302820-06	Washer, Flat 7/8 OD, 17/64 ID
2	2	56	08-1583927-05	Suction Cup, Magnetic Mount





LIGHTHEAD OPTIONS



QTY	ITEM	PART NUMBER	DESCRIPTION
*		01-0688204-00	CENTER OPTION MINI, FREEDOM IV
1	1	11-388044-018	Base, Extruded Freedom IV
1	2	21-11245004-1	Grommet, Special 1.562"
	3		
6	4	21-11263204-0	Grommet, 1" Slim Line
1	5	07-26D863-000	Brkt, Bulkhead Lens Mount Legacy Lightbar
1	6	07-26J382-000	Brkt, I/O Legacy/Freedom IV
1	7	02-016H602-01	I/O Board, Mini SOLO 12/24V Enhanced Cigar Plug
8	8	07-26F288-000	Brkt, Lens Mount Freedom IV
1	9	46-0743403-00	Cable 9/C 18 GA TPR 20'
1	10	07-26J582-000	Bracket, I/O Inner Legacy/Freedom IV
	11		
A/R	12	46-0742938-07	Cable 5/C 18 GA TPR 20'
	13		
1	14	39-1M17672-08	Housing, Plug 8-Pos 18 GA w/Locking Ramp
2	15	07-26F833-000	Bracket, Filler Alley Position Freedom IV
12	16	14-062216-081	Screw, 6-32 x 1/2 PPHMS SEMS w/Int L.Washer SS
A/R	17	01-0247247-30	3LED TIR Alley Light, Freedom IV
A/R	18	01-026F855-30	6TIR Alley Light, Freedom IV
4	19	19-147132-000	Retainer, Corner Linear Assy Freedom IV
2	20	01-026F826-__	Corner L Front/R Rear 12 LED Freedom IV
2	21	01-026F827-__	Corner R Front/L Rear 12 LED Freedom IV
A/R	22	01-026F758-__	Corner L Front/R Rear 18 LED Freedom IV
A/R	23	01-026F759-__	Corner R Front/L Rear 18 LED Freedom IV
A/R	24	68-396F390-__	Lens, Corner Filter Non-Optic Freedom IV
A/R	25	02-036G163-00	Blank, Rear Pass Corner Freedom IV
A/R	26	02-036G164-00	Blank, Rear Driver Corner Freedom IV
4	27	07-247177-000	Bracket, Full Filler Freedom IV
A/R	28	01-026F728-__	Full Linear Freedom IV
A/R	29	68-396F391-__	Lens, Full Linear Filter Non-Optic Freedom IV
A/R	30	01-026F778-30	6LED TIR Full Takedown Light Freedom IV
4	31	07-226279-000	Bracket, Filler 1.400" Freedom IV
4	32	07-26F382-000	Bracket, Snap-In Light Module MT
1	33	46-0787707-00	Harness J1 Mini Legacy
1	34	46-0787707-01	Harness J6 Mini Legacy
1	35	46-0787707-02	Harness J2 Mini Legacy
1	36	46-0787707-03	Harness J5 Mini Legacy
A/R	37	39-0402023-04	Housing, 2-Pos Socket Comm Mate-N-Lok
A/R	38	39-0403023-04	Housing, 3-Pos Socket Comm Mate-N-Lok
A/R	39	46-0787732-01	Harness, Alley Mini Legacy
A/R	40	46-0787732-00	Harness, Takedown Mini Legacy
	41		
1	42	68-196F602-30	Lens, Clear Optic 2-Light Center Freedom IV
2	43	02-036F779330	Lens, Cut Clear Grey 24" Mini Freedom IV
4	44	38-046F226-00	Seal, Lens Divider Freedom IV
2	45	38-046F227-00	Divider, Lens Freedom IV
4	46	14-104286-16J	Screw, 10-24 x 1.25 Shoulder PHTX Tri Point SS
1	47	11-26E377-009	Cover, Top Extruded Center Legacy Lightbar
2	48	11-247572-003	Cover, Top 3.36" Machined Freedom IV
8	49	15-105C76-148	Screw, 10 x 7/8 T-25 Torx Truss HD Plasti-Lok
1	50	02-0483969007	Kit, 7 Mounting, RTTNL. Install
1	51		
1	52		
1	53		
4	54	68-396F391-31	Lens, Metalized Full Filler Freedom IV
2	55	68-3947120-31	Lens, Metalized Half Filler Freedom IV
	56		