

# WHELEN<sup>®</sup>

## ENGINEERING COMPANY INC.

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Installation Guide:  
Freedom<sup>®</sup> IV NFPA LC 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

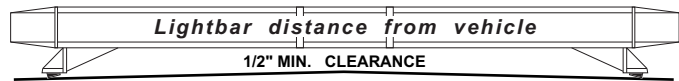
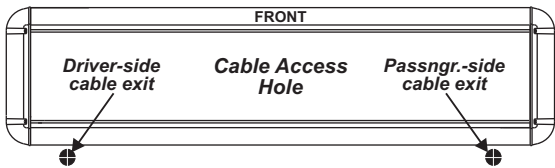
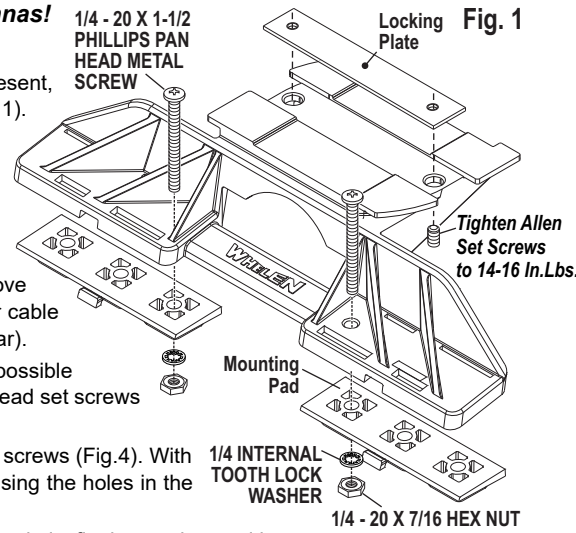
This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely. Important information is contained 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](http://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<sup>®</sup>, 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!**

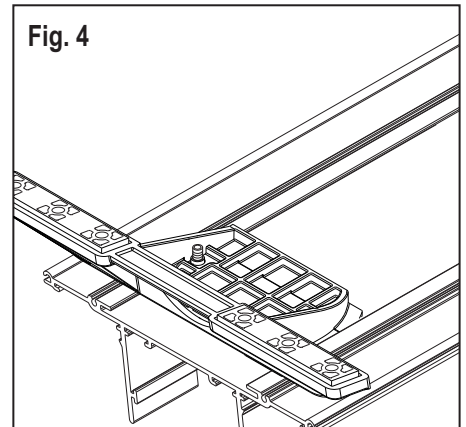
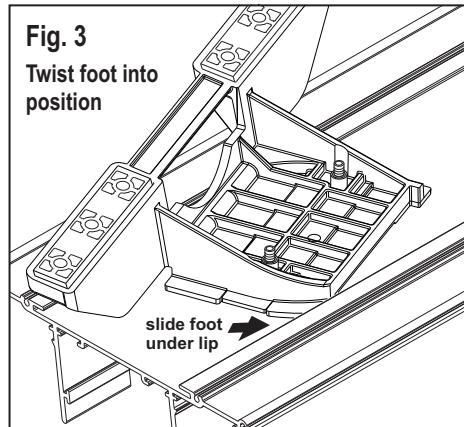
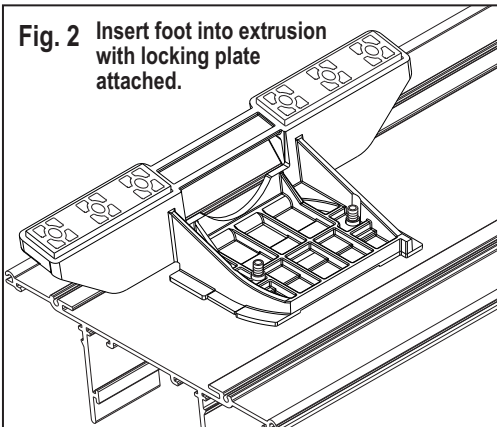
**IMPORTANT! The lightbar should be a minimum of 16" from any radio antennas!**  
**Permanent Mounting:**

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).
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. Directly above the B-pillars is the strongest part of the roof and is recommended. Check the light bar cable exit location to be sure that the lightbar is facing the correct 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 (Tighten Allen Set Screws to 14-16 In. Lbs.).
6. Turn the lightbar upside down and firmly tighten all of the mounting foot allen head set screws (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. You will need to lower the vehicle headliner (if present) for steps 7 & 8. 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.
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.



**IMPORTANT:** For strap mounting, be sure you have the right sized lightbar for your vehicle. The bar should be approximately the same width as the vehicle roof. If too large or small it will not mount properly and may come loose during driving.

**NOTE:** Unless otherwise specified, the lightbar mounting feet must be sitting as close to the edge of the roof as possible and in full contact with the roof and not be hanging off the edge.



## Control Cable:

Extend the control cable to your switch panel and make connections, using the information below. The control cable connects to your control head or switch box and is fused there. Applying +12VDC to a control wire will activate its function.

## Scan-Lock™ / White-Violet:

The WHT/VIO 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 +12 VDC to the WHT/VIO wire for less than 1 second and release.

To cycle backward apply +12 VDC to the WHT/VIO 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 lighthead will now display this pattern when activated.

### TO RESET TO THE FACTORY DEFAULT PATTERN:

With power off, apply +12 VDC to WHT/VIO wire while turning power on.

Use a normally open momentary switch for Scan-Lock operation

## IMPORTANT WARNING!

**CAUTION! DO NOT LOOK DIRECTLY AT THESE LEDS WHILE THEY ARE ON. MOMENTARY BLINDNESS AND/OR EYE DAMAGE COULD RESULT!**

## Available Flash Patterns

### All Directionals

1. SignalAlert™
2. CometFlash®
3. DoubleFlash 150
4. DoubleFlash 75
5. SingleFlash 375
6. SingleFlash 150
7. SingleFlash 75
8. ActionFlash™ 150
9. ModuFlash™
10. Steady/SingleFlash75
11. Steady/Steady
12. ActionScan™

### Corners

1. SignalAlert™
2. CometFlash®
3. DoubleFlash 150
4. DoubleFlash 75
5. SingleFlash 375
6. SingleFlash 150
7. SingleFlash 75
8. ActionFlash™ 150
9. ModuFlash™
10. ActionScan™

### Flashing TDs and Alleys

1. SingleFlash 240 (TD & Alley)
2. DoubleFlash 120 (TD & Alley)
3. SingleFlash 240 (TD)
4. DoubleFlash 120 (TD)
5. SignalAlert Freedom 75 (Alley)
6. CometFlash (Alley)
7. DoubleFlash 150 (Alley)
8. DoubleFlash 75 (Alley)
9. SingleFlash 300 (Alley)
10. SingleFlash 150 (Alley)
11. SingleFlash 75 (Alley)
12. ActionFlash™ 150 (Alley)
13. ModuFlash (Alley)
14. ActionScan (Alley)

### TA Sequences

1. Sequence On - Solid
2. Sequence On / Sequence Off
3. 1 Lamp - Triple Flash
4. 2 Lamp - Triple Flash

## Cruise Lights / Auxiliary / White-Orange:

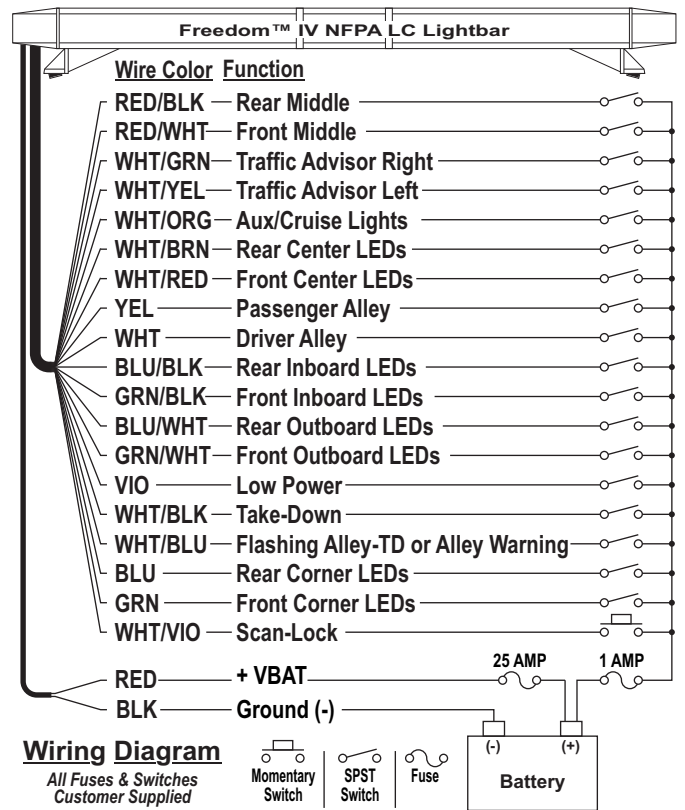
High Cruise & Auxiliary (default) or Low Cruise & Auxiliary or Cruise Off, Auxiliary Only (Activate WHT/ORG wire, then use Scan-Lock to select).

## Routing your Lightbar Cables:

1. To protect the headliner from damage caused by drilling the cable access hole through the vehicle roof, allow a 5" to 7" distance between roof and headliner by lowering the headliner before drilling.
2. Using a 1" hole saw, drill the cable access hole.

**WARNING!** There may be a roof support member that spans the distance between the driver's and passenger's side. **DO NOT DRILL THROUGH THIS MEMBER!** Adjust the location until the hole can be drilled without contacting this support member.

3. Use a round file to smooth and de-burr the edges of the hole.
4. Insert a 1" grommet (user supplied) into the cable access hole.
5. Insert the cables through the cable access hole into the vehicle. Use RTV silicone to weatherproof the access hole after the cables are pulled completely into the vehicle.



Applying +VBAT to both the WHT/YEL and WHT/GRN at the same time will give you a split TA. Applying +VBAT to a function wire activates that function.

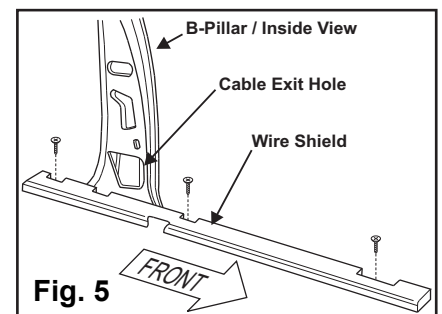
## Low Power / Violet:

The switch type used depends on how you wish Hi/Lo to function:

**Latching Mode:** Apply +12 VDC to the VIOLET 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 +12 VDC to the VIOLET wire for over 1 sec. to hold the lightbar in low power until voltage is removed. (Toggle Switch)

Route the cables down through the B-pillar taking a 90° turn to enter the B-pillar. Pull the full length of the cables out of the hole at the base of the B-pillar (Fig. 5) and route towards your switch panel.



Refer to parts drawing on next page.

QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	ITEM	PART NUMBER	DESCRIPTION
										*		01-0688033-00	55" FREEDOM IV, VLED NFPA
										*		01-0688033-01	60" FREEDOM IV, VLED NFPA
										*		01-0688033-02	72" FREEDOM IV, VLED NFPA
						*						01-0688033-03	81" FREEDOM IV, VLED NFPA
					*							01-0688033-04	92" FREEDOM IV, VLED NFPA
				*								01-0688033-05	55" FREEDOM IV, VLED NFPA
			*									01-0688033-06	60" FREEDOM IV, QLED NFPA
			*									01-0688033-07	72" FREEDOM IV, QLED NFPA
	*											01-0688033-08	81" FREEDOM IV, QLED NFPA
*												01-0688033-09	91" FREEDOM IV, QLED NFPA
-	-	-	-	1	-	-	-	-	1	1		11-387971-050	BASE, EXTRUDED MACHINED CENTER OPTION 55" FREEDOM IV
-	-	-	1	-	-	-	-	-	1	-	2	11-387701-055	BASE, EXTRUDED 55.020" MACHINED 60" FREEDOM IV
-	-	1	-	-	-	-	-	1	-	-	3	11-387986-066	BASE, EXTRUDED MACHINED 71.5" CTR SECTION FREEDOM IV
-	1	-	-	-	-	1	-	-	-	-	4	11-387721-076	BASE, EXTRUDED 76.268" MACHINED 81" FREEDOM IV
1	-	-	-	-	1	-	-	-	-	-	5	11-388106-087	BASE, EXTRUDED 87.9" MACHINED 92" FREEDOM IV
1	1	1	1	1	1	1	1	1	1	1	6	21-11245004-1	GROMMET, SPECIAL TO BE MOLDED 1.562"
2	2	2	2	2	2	2	2	2	2	2	7	21-7263998-00	PLUG, VENT .750 DIA HOLE LIGHTBAR
1	1	1	1	1	1	1	1	1	1	1	8	14-0023347-01	SCREW, 10-24 X .875" TX PHD 1/4" LEAD 5/8" THD
8	6	6	6	6	8	6	6	6	6	6	9	21-11263204-0	GROMMET, 1" SLIM LINE
2	2	2	2	2	2	2	2	2	2	2	10	07-26D863-000	BRACKET, BULKHEAD LENS MOUNT LEGACY LIGHTBAR
1	1	1	1	1	1	1	1	1	1	1	11	07-26D865-000	BRACKET, I/O ANCHOR LEGACY LIGHTBAR
2	2	2	2	2	2	2	2	2	2	2	12	38-0247191-00	INSULATOR, I/O EXTRUSION LIBERTY II
1	1	1	1	1	1	1	1	1	1	1	13	02-016G416-00	PCB EXPANDED LC I/O FREEDOM IV/LIBERTY II
24	20	16	12	12	24	20	16	12	12	14		07-26F288-000	BRACKET, LENS MOUNT FREEDOM IV
1	1	1	1	1	1	1	1	1	1	1	15	46-0746800-__	CABLE INPUT 2/C 8 GA LEGACY LIGHTBAR
1	1	1	1	1	1	1	1	1	1	1	16	46-0743903-__	CABLE INPUT CONTROL FREEDOM/LIBERTY 2
1	1	1	1	1	1	1	1	1	1	1	17	26-0115037-11	CABLE CLAMP, 11/16"D, 1/2"W .203" MTG HOLE, BLACK
1	1	1	1	1	1	1	1	1	1	1	18	13-104111-063	NUT, 10-24 CAD PLATED WHIZ OR STEEL ZINC PLATED
1	1	1	1	1	1	1	1	1	1	1	19	26-0215001-06	TY WRAP, 6" BLACK
4	4	4	4	4	4	4	4	4	4	4	20	19-147132-000	RETAINER, CORNER LINEAR ASSY FREEDOM IV
1	1	1	1	1	2	2	2	2	2	2	21	01-026F826-__	CORNER L-FRONT/R-REAR 12LED FREEDOM IV
1	1	1	1	1	2	2	2	2	2	2	22	01-026F827-__	CORNER R-FRONT/L-REAR 12LED FREEDOM IV
A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	23	01-026F758-__	CORNER L-FRONT/R-REAR 18LED FREEDOM IV
A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	24	01-026F759-__	CORNER R-FRONT/L-REAR 18LED FREEDOM IV
1	1	1	1	1	-	-	-	-	-	-	25	02-036G163-00	BLANK REAR PASS CORNER FREEDOM IV
1	1	1	1	1	-	-	-	-	-	-	26	02-036G164-00	BLANK REAR DRVR CORNER FREEDOM IV
20	16	16	12	12	20	16	16	12	12	27		14-062216-081	SCREW, 6-32 X 1/2 PPHMS SEMS W/IT LOCK WASHER 410 SS
-	-	-	-	-	2	2	2	2	2	2	28	07-26F833-000	BRACKET, FILLER ALLEY POSITION FREEDOM IV
2	2	2	2	2	-	-	-	-	-	-	29	01-026F730-55	SUB ASSY, HALF END LINEAR R/R FREEDOM IV
2	2	2	2	2	2	2	2	2	2	2	30	01-026F728-55	SUB ASSY, FULL LINEAR RED/RED FREEDOM IV
2	2	2	2	2	2	2	2	2	2	2	31	01-026F728-33	SUB ASSY, FULL LINEAR WHT/WHT FREEDOM IV
28	24	20	16	12	28	24	20	16	12	32		07-247177-000	BRACKET, FULL FILLER FREEDOM IV
-	-	-	-	4	-	-	-	-	4	33		07-247178-000	BRACKET, HALF FILLER FREEDOM IV
-	-	-	-	4	-	-	-	-	4	34		07-223841-000	BRACKET, SPACER LEGACY LTBAR
12	8	8	4	-	12	8	8	4	-	35		07-226279-000	BRACKET, FILLER 1.400" FREEDOM IV
1	1	1	1	1	1	1	1	1	1	1	36	46-0787786-00	HARNESS "A" ALL LENGTHS FREEDOM IV
-	-	-	2	2	-	-	-	2	2	37		46-0787786-02	HARNESS "B" UP TO 60" FREEDOM IV
-	-	-	2	2	-	-	-	2	2	38		46-0787786-04	HARNESS "C" UP TO 60" FREEDOM IV
-	-	-	2	2	-	-	-	2	2	39		46-0787786-03	HARNESS "D" UP TO 60" FREEDOM IV
-	-	-	1	1	-	-	-	1	1	40		46-0787786-01	HARNESS "E" UP TO 60" FREEDOM IV
-	-	-	1	1	-	-	-	1	1	41		46-0787786-05	HARNESS "F" UP TO 60" FREEDOM IV
-	2	2	-	-	-	2	2	-	-	42		46-0787854-02	HARNESS "B" 72" TO 83" FREEDOM IV
-	2	2	-	-	-	2	2	-	-	43		46-0787854-04	HARNESS "C" 72" TO 83" FREEDOM IV
-	2	2	-	-	-	2	2	-	-	44		46-0787854-03	HARNESS "D" 72" TO 83" FREEDOM IV
-	1	1	-	-	-	1	1	-	-	45		46-0787854-01	HARNESS "E" 72" TO 83" FREEDOM IV
-	1	1	-	-	-	1	1	-	-	46		46-0787854-05	HARNESS "F" 72" TO 83" FREEDOM IV
2	-	-	-	-	2	-	-	-	-	47		46-0787969-02	HARNESS "B" 92" TO 98" FREEDOM IV
2	-	-	-	-	2	-	-	-	-	48		46-0787969-04	HARNESS "C" 92" TO 98" FREEDOM IV
2	-	-	-	-	2	-	-	-	-	49		46-0787969-03	HARNESS "D" 92" TO 98" FREEDOM IV
1	-	-	-	-	1	-	-	-	-	50		46-0787969-01	HARNESS "E" 92" TO 98" FREEDOM IV
1	-	-	-	-	1	-	-	-	-	51		46-0787969-05	HARNESS "F" 92" TO 98" FREEDOM IV
32	28	24	20	20	32	28	24	20	20	52		07-26F382-000	BRACKET, SNAP-IN LT MODULE MT FREEDOM REDESIGN
A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	A/R	53	26-0215001-03	TY WRAP, 3" BLACK
-	-	-	-	2	-	-	-	-	2	54		02-036F779130	SUB ASSY, LENS CUT CLEAR GREY FREEDOM IV
2	2	2	2	2	2	2	2	2	2	55		02-036F779-30	SUB ASSY, LENS FULL CLEAR GREY FREEDOM IV
3	3	1	1	1	3	3	1	1	1	56		68-196F602-30	LENS, CLEAR OPTIC 2-LT CENTER FREEDOM IV
2	-	2	-	-	2	-	2	-	-	57		68-196F612-30	LENS, CLEAR OPTIC 1-LT CENTER FREEDOM IV
1	1	1	1	1	1	1	1	1	1	58		10-0346824-00	LABEL, CENTER DOME REMOVAL INSTRUCTIONS
12	8	8	4	4	12	8	8	4	4	59		38-046F226-00	SEAL, LENS DIVIDER FREEDOM IV
6	4	4	2	2	6	4	4	2	2	60		38-046F227-00	DIVIDER, LENS FREEDOM IV
4	4	4	4	4	4	4	4	4	4	61		14-104286-16J	SCREW, 10-24 X 1.25" WAX DIP SHOULDER PHTX TRI POINT SS
-	-	-	-	2	-	-	-	-	2	62		11-26E056-119	COVER, TOP EXTRUDED 19.275" .1561" HOLES FREEDOM
2	2	2	2	-	2	2	2	2	-	63		11-26E056-021	COVER, TOP EXTRUDED 21.665", 17.625" HOLES LEGACY
3	3	1	1	1	3	3	1	1	1	64		11-26E377-009	COVER, TOP EXTRUDED CENTER LEGACY LTBAR
2	-	2	-	-	2	-	2	-	-	65		11-26F554-004	COVER, TOP 4.758" SINGLE CTR FREEDOM IV
24	20	16	12	12	24	20	16	12	12	66		15-105C76-148	SCREW, 10 X 7/8 T-25 TORX TRUSS HD PLASTH-LOC SS W/INSEAL
1	1	1	1	1	1	1	1	1	1	1	67	02-0342982-00	SUB ASSY, MTG FOOT AND PADS ROT.INSTALL
1	1	1	1	1	1	1	1	1	1	1	68	10-0322935-00	LABEL, "FRONT" LIGHTBAR ASSYS
1	1	1	1	1	1	1	1	1	1	1	69	10-0526294-00	LABEL, PN/MN/SN FREEDOM IV
1	1	1	1	1	1	1	1	1	1	1	70	10-0526295-00	LABEL, SERIAL NUMBER FREEDOM IV

NOTE: Not all parts in list are shown in parts drawing.

