

WHELEN[®]

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Installation Guide:
Tracer™ Series Lightbar
with Traffic Advisor™

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!**

IMPORTANT NOTE FOR ALL MOUNTING OPTIONS: There is a label on each lightbar showing the correct orientation the lightbar should be mounted. Always refer to the direction indicated when mounting the lightbar.

Running Board Mounting

Mounting:

2015-19 Ford Explorer

2015-18 Dodge Ram 1500 Crew Cab

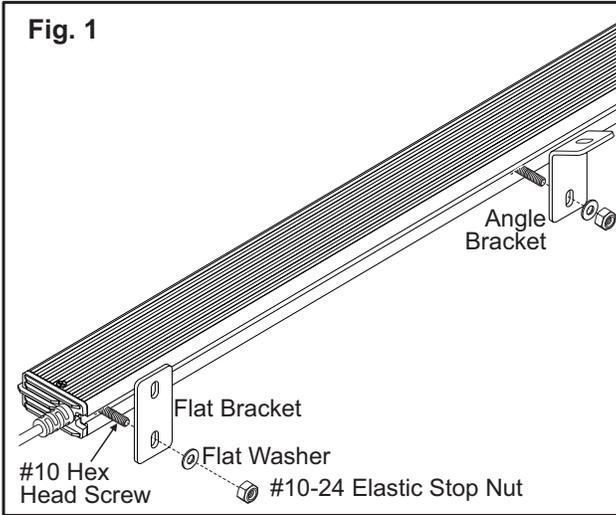
Universal L-Bracket

2015-21 Dodge Charger

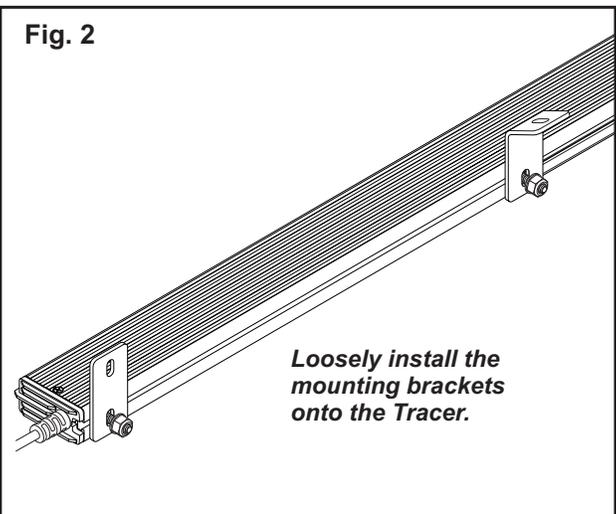
2019-21 Dodge Ram 1500 Classic

2015-21 Dodge Durango

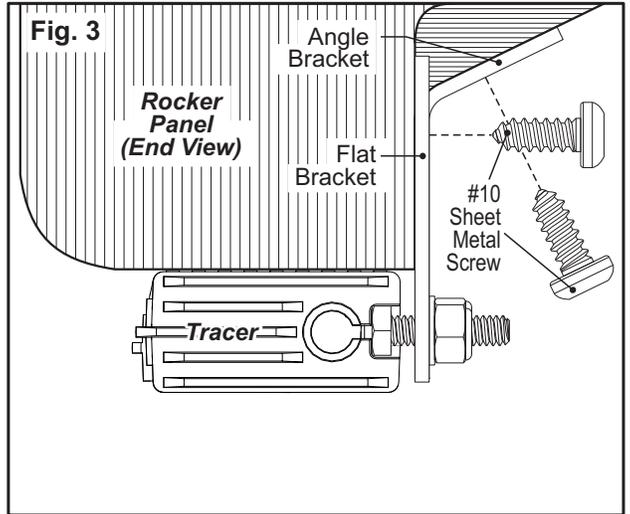
1. Loosely install the brackets onto the Tracer (Figs. 1 & 2). Note that the flat bracket (if included) is designed to be used on the stud located nearest to the rear of the vehicle. (See next page for special 2021 Chevrolet Tahoe mounting)



2. Position the Tracer assembly into its mounting location between the two factory jacking points on your vehicle. With the assembly properly positioned, and using the brackets as guides, mark the locations for the mounting holes. Using a #21 bit (Ø.159), drill and deburr mounting holes at each of the locations marked in the previous step.
Note: Be sure to apply a generous, protective layer of RTV in and around each of these holes before continuing.



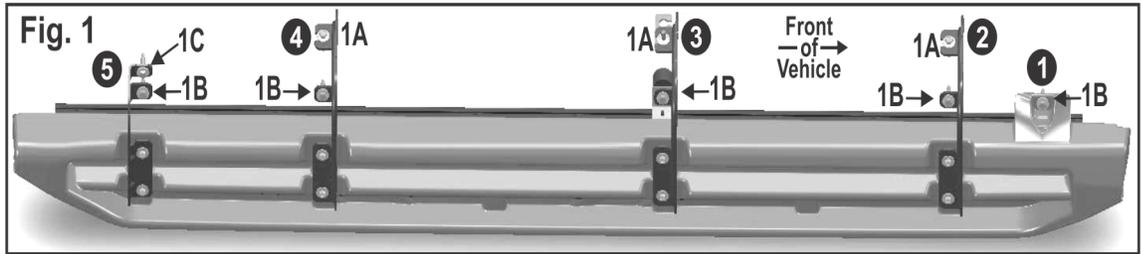
3. Using the hardware provided, secure the Tracer assembly to the vehicle as shown (Fig 3). Tighten the hardware used to secure the brackets to the Tracer.



4. Wire the Tracer as outlined in the Wiring section of this installation guide.

Mounting: 2021 Chevrolet Tahoe PPV/SSV (with Factory Running Board) / 2021 Suburban
IMPORTANT: These mounting brackets can only be used with factory equipped molded plastic running boards
2021 Suburban: Mounting is the same except the Suburban uses an extra mounting bracket (Fig. 6)

The Tracer Mounts, between the running board and vehicle body.



1. Remove factory running board (Fig. 1):
 - a. Loosen upper bolts (DO NOT REMOVE), qty. 3 (horizontally installed)
 - b. Remove lower bolts qty. 5 (vertically installed)
 - c. Remove the additional rear bolt qty. 1 (vertically installed)



2. Using the supplied "L" brackets, mounting bolt's, 10-24 locking nuts, and washers loosely mount the supplied "L" brackets to the Tracer to aid in mounting (Fig 2). **NOTE: See Fig. 6 for 2021 Suburban.**

3. Locate the three lowering plates with studs provided in the Tracer installation kit and hang them from the three factory bolts that were loosened from step 1 (Fig. 3).



NOTE: (It is recommended to lightly tighten the factory bolts to aid in the installation of the running board)
 a. Loosely place the three 5/16-18 nylock nuts with three 5/16 flat washers onto each of the studs on the lowering plates

4. Hang the factory running board on the three studs of the newly added lowering plates (Fig. 4)
 a. Be sure that order of parts is in the following order: nut, washer, running board bracket, lowering plate.



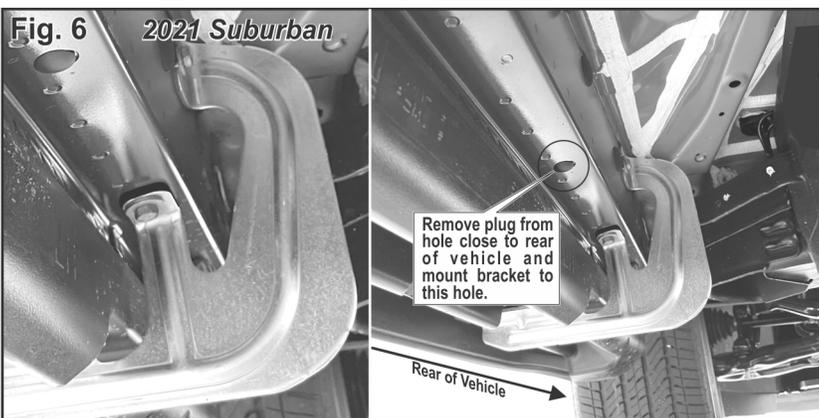
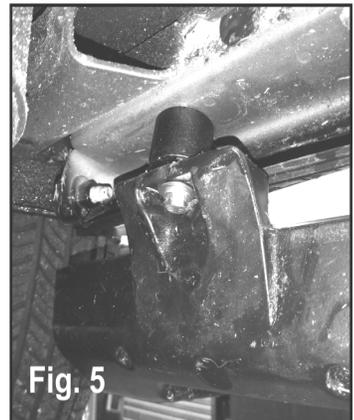
5. Install the supplied spacers using the supplied M8-1.25 x50mm bolts and washers. (the forward most factory running board mounting location will not get a "L" bracket installed to it) **NOTE: The Suburban uses a 6th spacer with tracer mounting items, see Fig. 6 for location.**

- a. It is recommended to install the center mounting bolt and spacer to aid in installation of the Tracer with "L" mounting already attached
- b. Start with the 2nd bolt, placing the Tracer with "L" bracket and work your way to the rear of the vehicle. (Place the mounting brackets in the following order: 2, 4, 5, 3) (Refer to circled numbers in Fig. 1).
- c. Order of parts will be: Bolt, washer, factory running board bracket, tracer "L" bracket, spacer, vehicle body

NOTE: Do Not Tighten these bolts completely

6. Loosen the three factory bolts from Step 3.
7. Tighten the five mounting bolts that have the spacers and Tracer mounting brackets
 a. It is recommended to start with the center bolt (Fig. 5) and work towards the outer bolts (3, 2, 4, 1, 5) (Refer to the circled numbers in Fig. 1)
8. Tighten the upper three nuts with washers to the lowering plate and tighten the three factory bolts with washers

Note: It is suggested to have the factory bolt with washer to be over the factory running board bracket (parts order: bolt, washer, factory bracket, lowering plate, vehicle body)

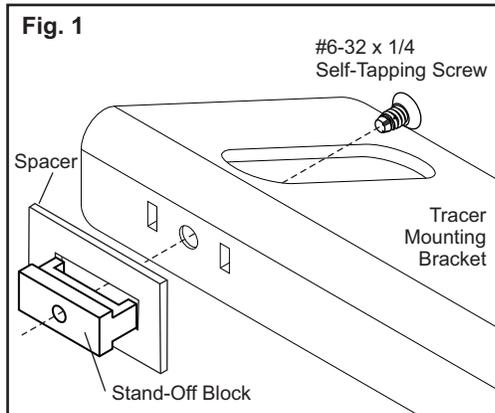


9. Center the Tracer for height and front/rear alignment and perform final tightening of the Tracer mounting nuts on the "L" brackets.

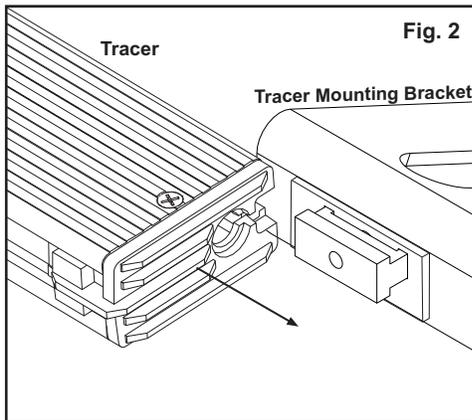
Important! During reassembly, tighten all vehicle hardware to the recommended torque values specified in the Factory Service Manual for your vehicle.

Mounting:
2009-18 Chevy Silverado 1500 (with Factory Running Board)

- Using #6-32 x 1/4 self-tapping screws (included), loosely install the six stand-off blocks onto the mounting bracket as shown with supplied spacers (Fig. 1).



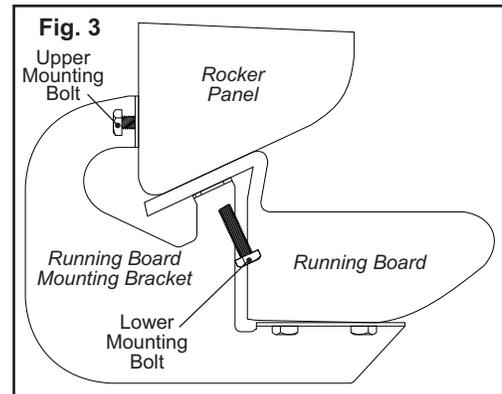
- Slide the bracket assembly into either end of the extrusion. Note that the Tracer may be installed so that the end with the cable is oriented towards either the front or the rear of the vehicle (Fig. 2). Note that applying a light coating of WD-40 to the inside track of the extrusion will allow the assembly to slide more easily.



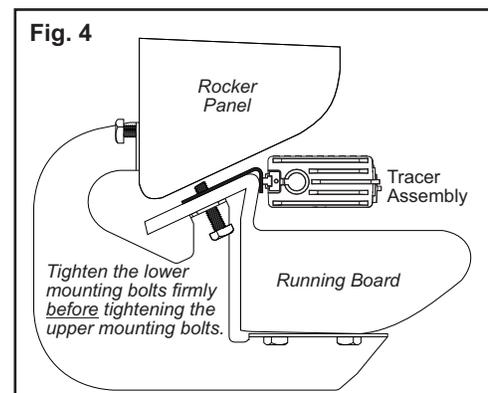
- Slide the mounting bracket into the extrusion until it is centered on the Tracer.
Tahoe: Slide the mounting bracket into the extrusion until the end of the Tracer extends 1" beyond the edge of the bracket. This end, when installed, will be nearest to the rear of the vehicle.

- Tighten each of the 6 screws firmly to lock the Tracer into position. The Tracer assembly may now be installed onto the appropriate running board.
- There are several brackets used to mount the running board to the vehicle. Remove all of the lower bolts used to secure the running board to the vehicle (Fig. 3).

Loosen but **do not remove** the upper mounting bolt for each bracket. This allows the running board to be lowered so that the Tracer assembly can be installed between the rocker panel and the running board.



- Position the Tracer assembly between the running board and the vehicle rocker panel (Fig. 4). Align the Tracer's mounting bracket holes with the lower mounting bolt holes in the running board. **Important! During reassembly, tighten all vehicle hardware to the recommended torque values specified in the Factory Service Manual for your vehicle.**



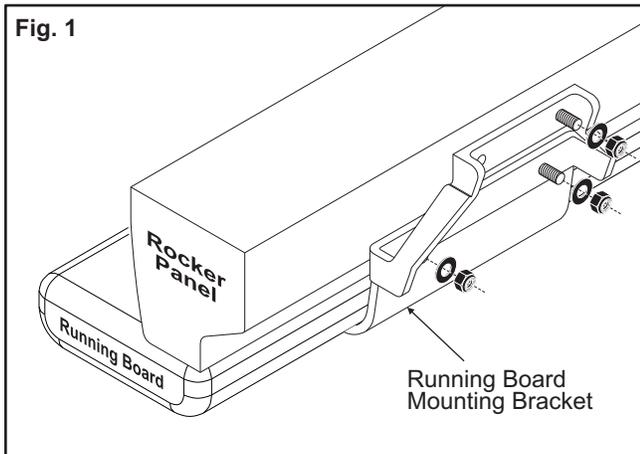
- Return the lower mounting bolts removed in Step 4 to their original location. Tighten these bolts so that the Tracer assembly is drawn up against the rocker panel. The upper mounting bolts should now be tightened.
- Wire the Tracer as shown in the Wiring section.

Mounting:

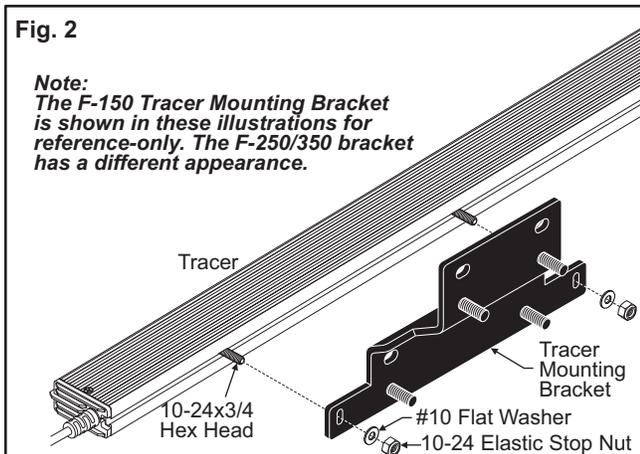
2015-21 Ford F-150 (with Factory Running Board)

2017-21 Ford F-250/350 (with Factory Running Board)

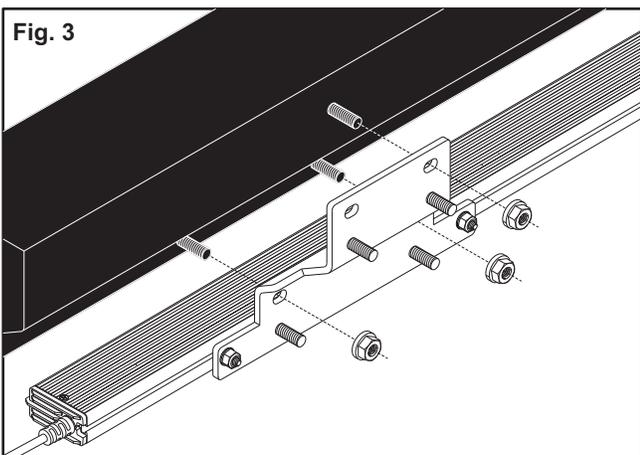
2018-21 Ford Expedition (with Factory Running Board)



1. Remove and retain the hardware used to secure the running board/mounting bracket assembly to the backside of the rocker panel. Remove the running board/bracket assembly from the vehicle (Fig.1). **Note: For F-250/350, plastic bracket covers must be removed.**



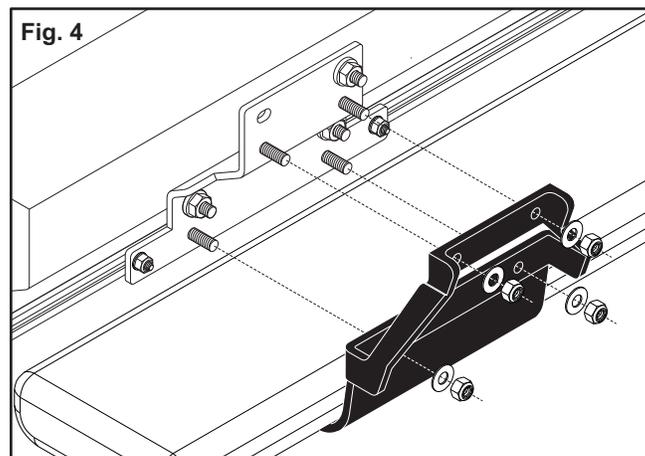
2. Using the hardware shown in Fig. 2, loosely install the three Tracer mounting brackets onto the Tracer.



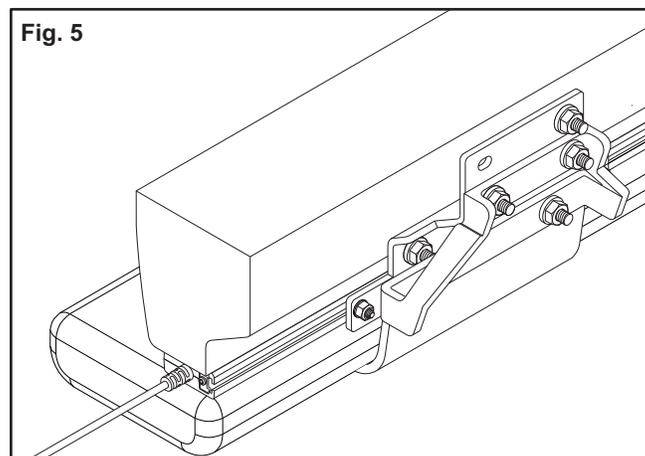
3. **F-150:** Using the hardware removed in Step 1, install these brackets onto the vehicle in the same location as the existing running board brackets (Fig. 3). **Note: The Tracer cable should exit towards the rear of the vehicle.**

F-250/350: Position the running board/mounting bracket assembly onto the rocker panel studs so that the Tracer bracket is between the rocker panel and the running board bracket. Use the hardware removed in step 1 to secure the brackets to the vehicle. **Note: The Tracer cable should exit towards the rear of the vehicle.**

4. Adjust the position of the Tracer fore and aft until it is in the desired location. Tighten the hardware firmly to lock the Tracer in position.



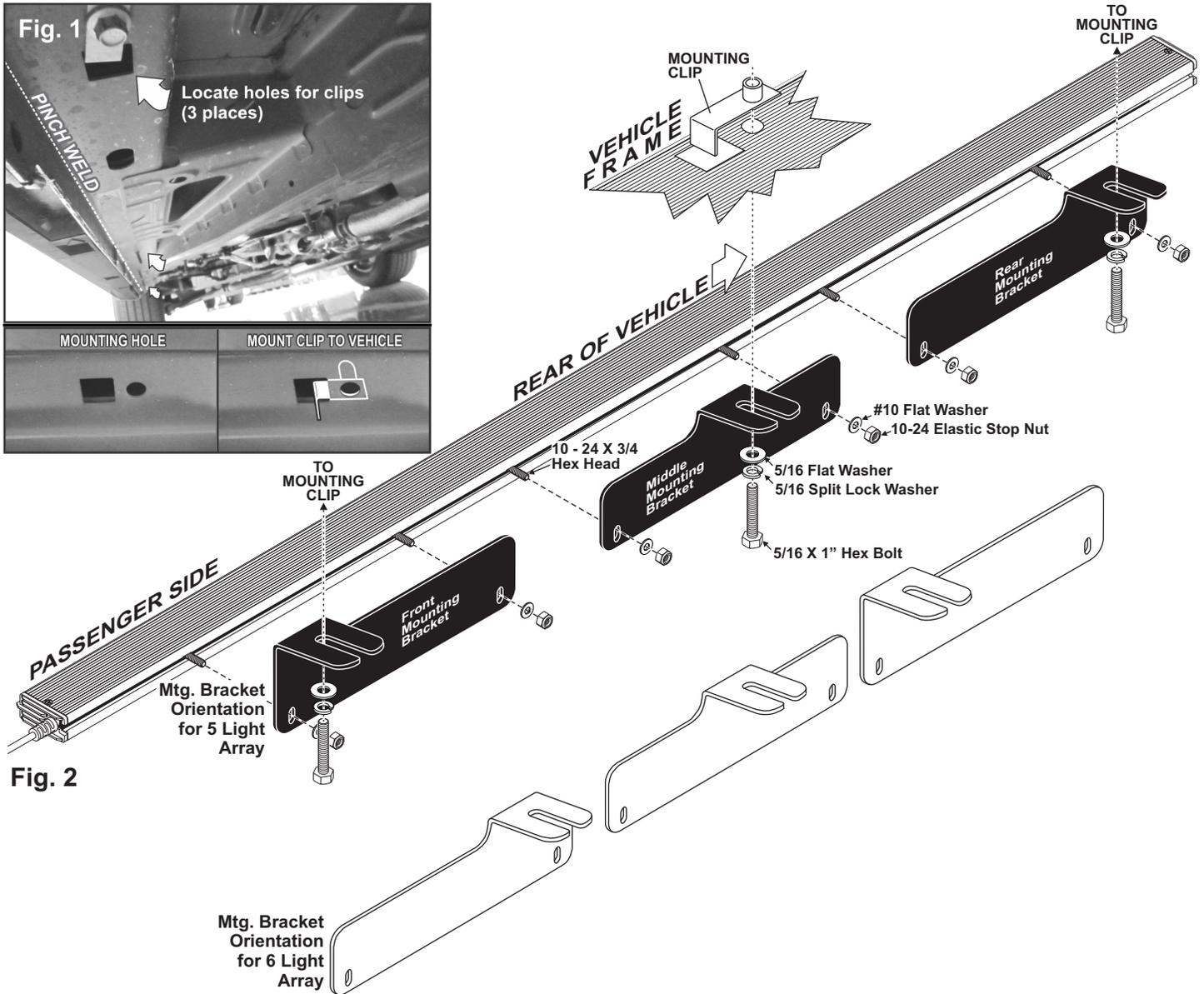
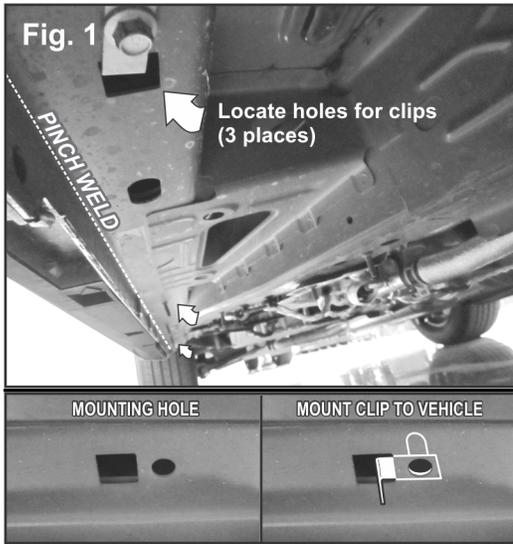
5. Using the hardware provided, secure the running board/mounting bracket assembly to the Tracer mounting brackets (Fig. 4).



6. Fig. 5 shows the general appearance of the finished assembly. When all of the components are in their proper location, tighten all hardware. **Important! During reassembly, tighten all vehicle hardware to the recommended torque values specified in the Factory Service Manual for your vehicle. Tighten all Whelen hardware using similar values.**

7. Wire the Tracer as shown in the Wiring section of this installation guide.

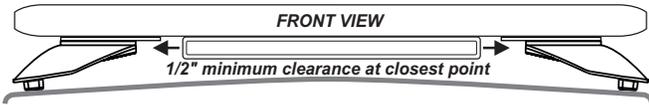
Mounting:
2020-21 Ford Interceptor SUV (with Factory Running Board)



Installation:

1. On the vehicle frame, locate the holes you will mount the brackets to and insert the supplied clips (Fig. 1). Loosely secure the clips to the vehicle with the supplied 5/16 hex bolt and washers. Tighten hardware just enough so that you will be able to slide the mounting brackets between the flat washer and vehicle.
2. Mount the 3 mounting brackets to the clips you installed in step 1 making sure the brackets sit against the pinch weld in the frame (Fig. 2) and tighten the mounting hardware firmly. There is a specific front, middle and rear bracket. Be sure to mount the brackets to their correct orientation (See Important Note below). The passenger side is shown here. The driver side mounts the same.
IMPORTANT NOTE: Make sure you have the outer mounting brackets orientated correctly for either a 5 or 6 light array.
3. Slide the supplied 10-24X3/4 Hex Head Bolts into the track in the rear of the lightbar. Line the bolts up to the mounting brackets you installed in step 2 and secure the lightbar to the brackets using the supplied flat washer and lock nut.
4. Wire the lightbar as shown in the wiring section of this installation guide.

Lightbar Mounting



IMPORTANT: There must be at least a 1/2 inch clearance between the bottom of the lightbar and the vehicle roof. A Tracer mounted to the bottom of the lightbar will significantly add to the lightbar's depth. You may need taller mounting feet to accommodate the added Tracer. Before starting the installation, check to see if the lightbar will clear the roof after the Tracer is added.

You must also make sure that the Tracer and mounting brackets will fit between the mounting feet and their mounting brackets.

Mounting brackets will mount to the lightbar extrusion using the track that runs the length of the lightbar in the same manner as the mounting feet.

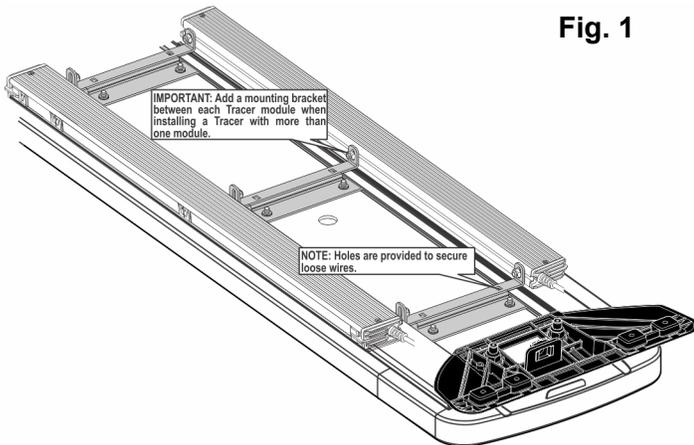
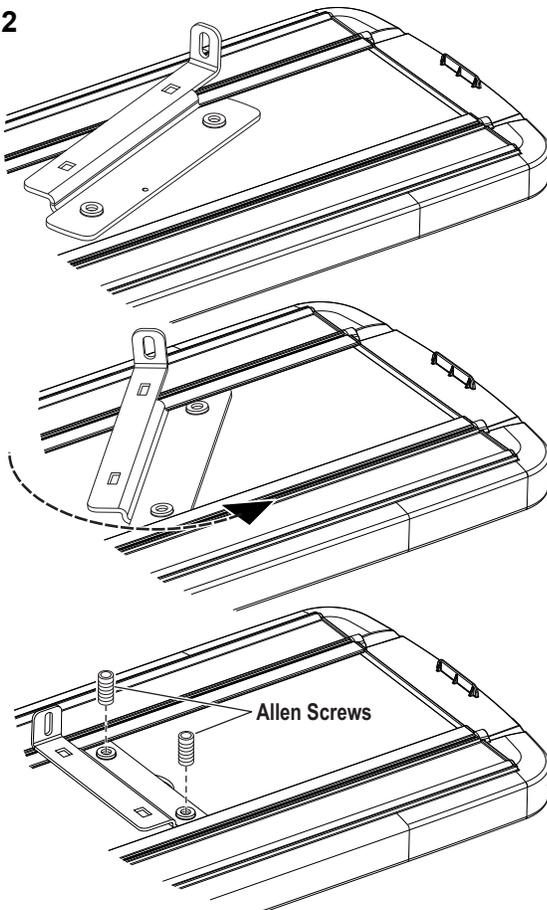


Fig. 2



Mounting the brackets:

1. Flip the lightbar upside-down and place the bracket onto the track in the middle of the extrusion, sliding one side of the bracket under one of the lips on the extrusion (Fig. 2). Rotate the bracket 90° so that the edges of the bracket swing into position under both lips.
2. Slide the brackets into position on the extrusion and loosely secure them with the 2 supplied allen screws.
NOTE: A single Tracer will only need a mounting bracket at each end. When you mount any of the larger units they will need a mounting bracket on each end as well as an extra bracket where each module meets (Fig. 1).
3. Place the Tracer into the position it will be mounted. With the Tracer in position, slide the mounting brackets along the extrusion so that they will line up with the mounting screws on the Tracer then tighten the allen screws on the mounting brackets firmly.

Mounting the Tracer to the lightbar:

1. Slide the supplied #10 - 24 X 3/4" Hex Head Machine Screws into the track on the back of the Tracer. Make sure you have the correct amount of screws to accommodate the Tracer(s) you are mounting.
2. Mount the lightbar(s) to the brackets using the supplied mounting hardware (Fig. 3).

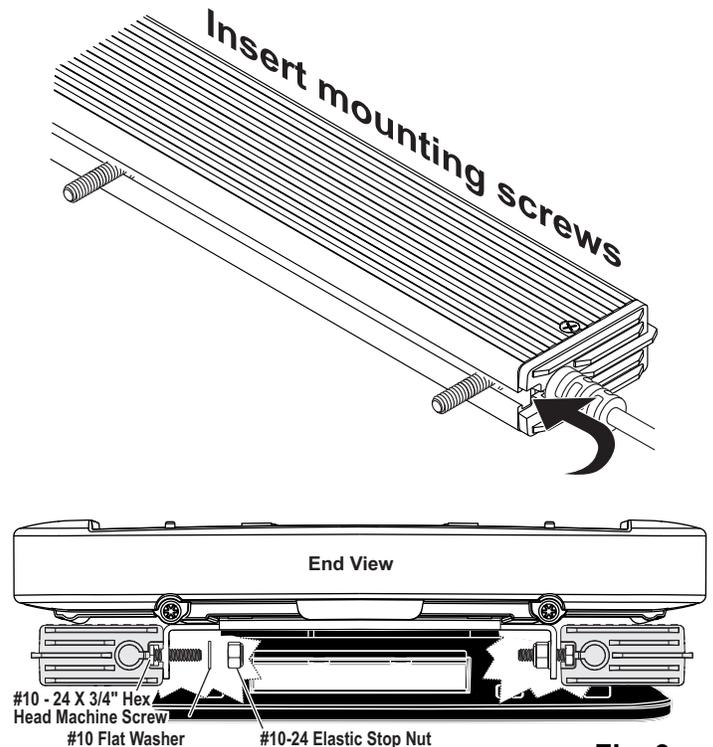


Fig. 3

3. Wire the Tracer as shown in the Wiring section of this installation guide.

**Mounting:
2019-21 Chevrolet Silverado:**

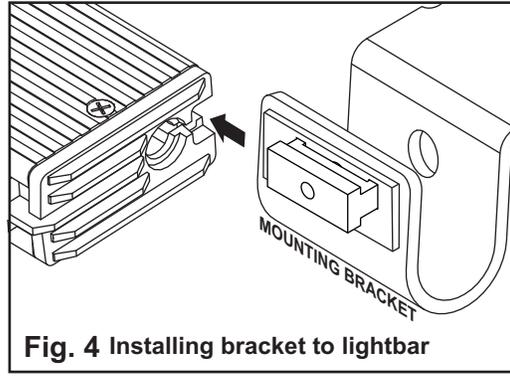
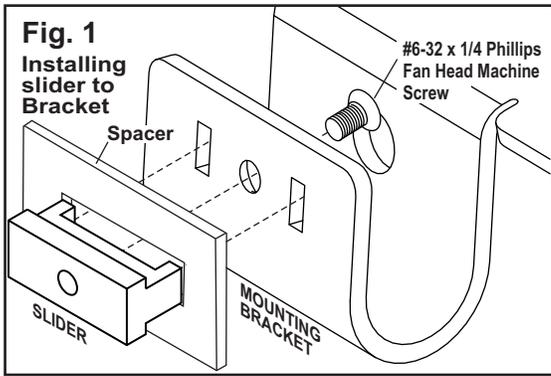
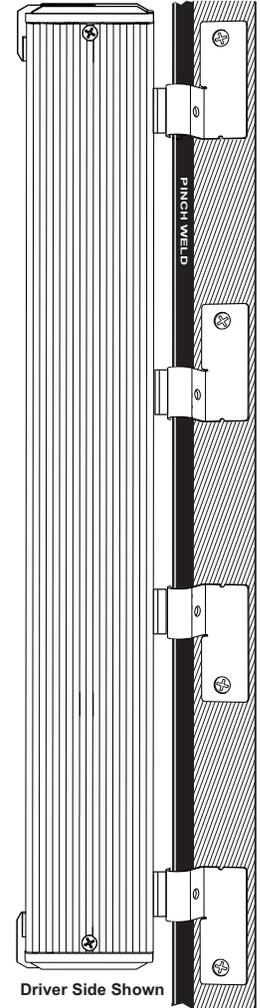
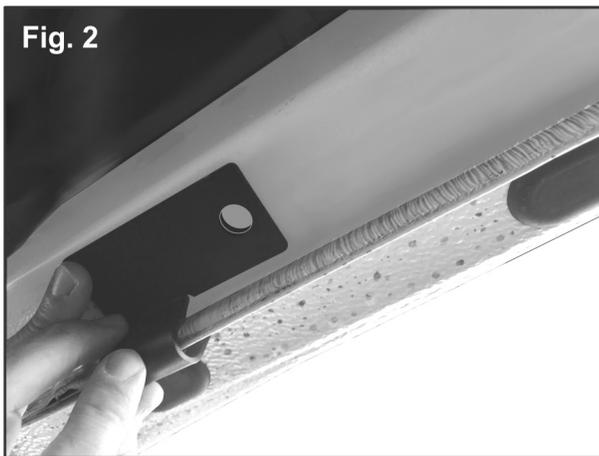


Fig. 3 Bracket Orientation



1. Loosely install the slides and spacers onto the four mounting brackets using the supplied 6 - 32 X 1/4 Phillips Fan Head Machine Screws (Fig. 1). You will tighten the screws later when you mount the light to secure it.
NOTE: The mounting brackets will sit on the frame. The curved part of the bracket will straddle the pinch weld as shown (Fig. 2).

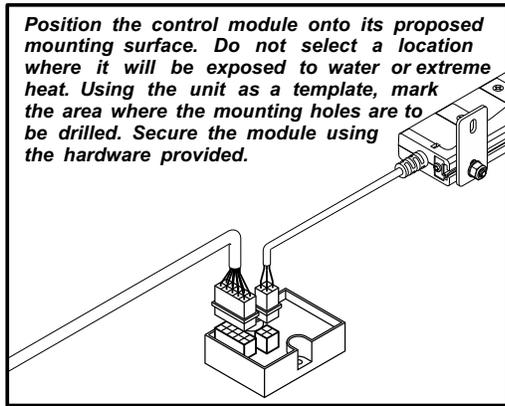


2. The brackets will mount using the existing mounting hardware that holds the running boards to the vehicle. Secure the 4 mounting brackets to the vehicle with the running board mounting hardware and tighten all mounting hardware firmly. Orient the brackets as shown (Fig. 3).
3. Slide the lightbar onto the slides on the mounting brackets. When the light is in position, tighten the screws on the slides to secure the light (Fig. 4).
4. Wire the Tracer as shown in the wiring section.

Important! During reassembly, tighten all vehicle hardware to the recommended torque values specified in the Factory Service Manual for your vehicle. Tighten all Whelen hardware using similar values.

Wiring

1. Position the flasher unit onto its proposed mounting surface. Do not select a location where it will be exposed to extreme heat and is protected from any potential damage that could be incurred by vehicle operation.

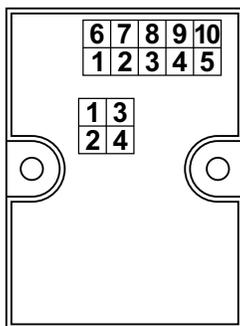
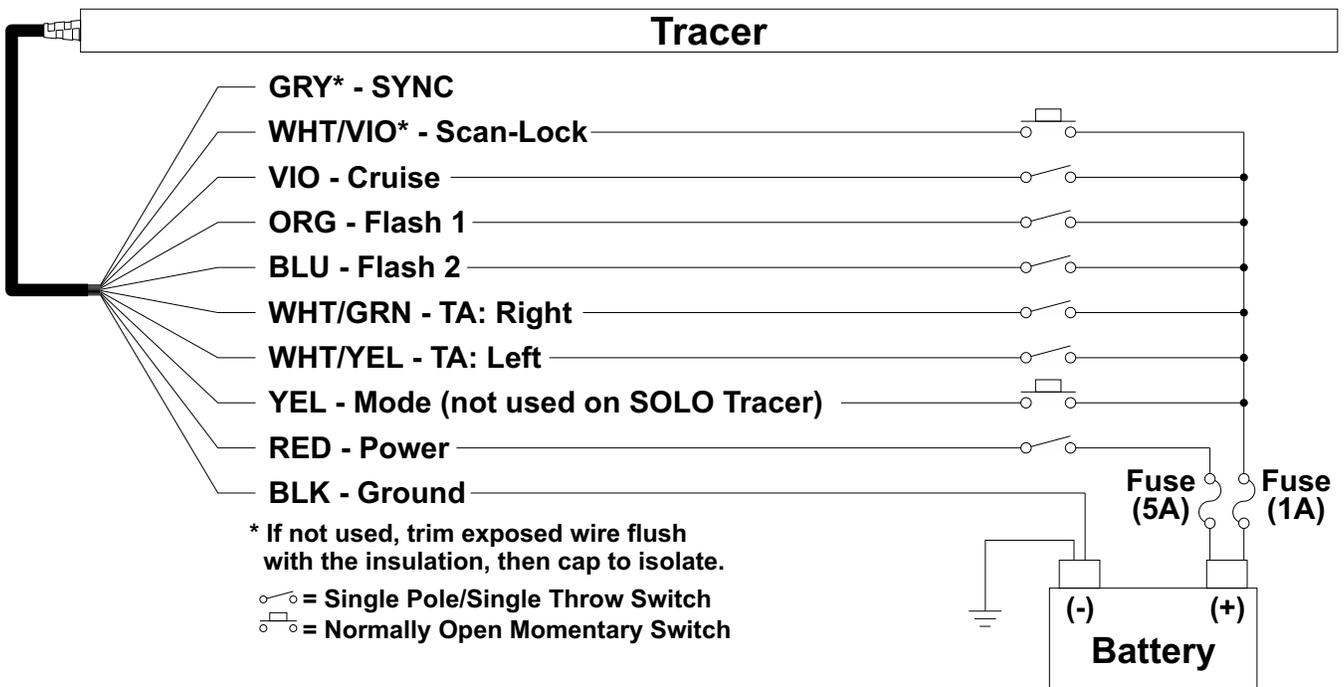


2. Using the module as a template, mark the area where the mounting holes are to be drilled. Secure the unit using the hardware provided.

3. Route the Tracer's 4-conductor cable to the Control Module. Route the 10-position control cable from the module to your switch/control panel (user supplied) and make the necessary electrical connections as shown in the wiring diagram below.

SYNC

The Tracer offers several SYNC patterns (see Pattern List) that enables the displays from two Tracers to be synchronized. To coordinate the display patterns, the SYNC wire (GRY) from each Tracer must be connected to each other. NOTE: If this wire is not used, trim the exposed wire so it is flush with the insulation, then cap to isolate it.



10-Pos. Connector

Pos.	Color	Function
1	RED	Power
2	WHT/VIO	Scan-Lock
3	VIO	Cruise
4	ORG	Flash 1
5	BLK	Ground
6	GRY	SYNC
7	YEL	Mode
8	BLU	Flash 2
9	WHT/GRN	TA: Right
10	WHT/YEL	TA: Left

4-Pos. Connector

Pos.	Color	Function
1	RED	Power
2	WHT	Serial Data
3	BLK	Ground
4	GRN	Serial Clock

Operation

WHT/VIO (ScanLock)

YEL (Mode) (TRIO & DUO-only)

Input Wires	ORG (Flash 1)	When the ORG wire is active, ScanLock is used to select the Flash 1 pattern (default = SignalAlert ALT) see 'Pattern List'	When the ORG wire is active, Mode is used to select Flash 1 Color(s) (default = Mode 1) see 'Mode List' for details
	BLU (Flash 2)	When the BLU wire is active, ScanLock is used to select the Flash 2 pattern (default = Comet Flash ALT) see 'Pattern List'	When the BLU wire is active, Mode is used to select Flash 2 Color(s) (default = Mode 2) see 'Mode List' for details
	ORG+BLU (Flash 3)	When the ORG+BLU wires are both active, ScanLock is used to select the Flash 3 pattern (default = SingleFlash 75) see 'Pattern List'	When the ORG+BLU wires are active, Mode is used to select Flash 3 Color(s) (default = Mode 3) see 'Mode List' for details
	VIO (Cruise)	When the VIO wire is active, ScanLock is used to select from 1 of 7 Cruise light intensity levels (default intensity = 2)	When the VIO wire is active, Mode is used to select the Cruise Color(s) (default = Mode 1) see 'Mode List' for details
	WHT/YEL (TA: Left)	When the WHT/YEL wire is active, TA will Sequence to LEFT (Default = Sequence to Solid)	When the WHT/YEL wire is active, Mode is used to select TA Color Color (default = Mode 2) see 'Mode List' for details
	WHT/GRN (TA: Right)	When the WHT/GRN wire is active, TA will Sequence to RIGHT (Default = Sequence to Solid)	When the WHT/GRN wire is active, Mode is used to select TA Color Color (default = Mode 2) see 'Mode List' for details
	WHT/YEL+ WHT/GRN (TA: Split)	When the WHT/YEL+WHT/GRN wires are active, TA Sequence will be SPLIT (Default = Sequence to Solid)	When the WHT/YEL+WHT/GRN wires are active, Mode is used to select TA Color Color (default = Mode 2) see 'Mode List' for details

Mode List - TRIO: **Mode 1.** Color 1 **Mode 4.*** Color 1 then Color 2 **Mode 7.*** Color 1 then Color 2 then Color 3
 Mode 2. Color 2 **Mode 5.*** Color 1 then Color 3 * = Not available on TA
 Mode 3. Color 3 **Mode 6.*** Color 2 then Color 3

Mode List - DUO: **Mode 1.** Color 1 **Mode 3.*** Color 1 then Color 2
 Mode 2. Color 2 * = Not available on TA

Mode List - SOLO: *Mode not applicable for SOLO models.*

Traffic Advisor Patterns:

1. Sequence to Solid
2. Sequence On, Sequence Off
3. Three Lamp Sequence
4. Two Lamp Sequence
5. Single Lamp Sequence

Notes:

1. Left, Right and Split are only available in 4-, 5- & 6-module Tracers.
2. "Left" is defined as sequencing towards the control module.

Cruise Intensity Levels:

1. 1.6%
2. 3.2%
3. 6.4%
4. 12.8%
5. 25.2%
6. 50.0%
7. 100.0%

Pattern List (All Tracer Models)

1.	SignalAlert™	SIM	16. SingleFlash 300	ALT
2.	SignalAlert	ALT	17. ModuFlash™	SIM
3.	Comet Flash®	SIM	18. ModuFlash	ALT
4.	Comet Flash	ALT	19. FlimFlam™	SIM
5.	DoubleFlash	SIM	20. FlimFlam	ALT
6.	DoubleFlash	ALT	21. MicroBurst™	SIM
7.	SingleFlash 75	SIM	22. MicroBurst	ALT
8.	SingleFlash 75	ALT	23. ZigZag	Left
9.	LongBurst™	SIM	24. ZigZag	Right
10.	LongBurst	ALT	25. ActionFlash™	Left
11.	PingPong™	SIM	26. ActionFlash	Right
12.	PingPong	ALT	27. ActionScan™	Left
13.	SingleFlash 120	SIM	28. ActionScan	Right
14.	SingleFlash 120	ALT	29. Steady	Sim
15.	SingleFlash 300	SIM	30. Steady	ALT

Bold = SYNC Pattern

Restoring default Patterns

1. Activate main power.
2. Apply +12VDC to Scan-Lock (WHT/VIO).
3. Now activate the desired input.
4. Allow display to run for a few seconds, then remove power from Scan-Lock.

Note:

If this wire is not used, trim the exposed wire so it is flush with the insulation, then cap to isolate it.

Restoring default Modes

1. Activate main power.
2. Apply +12VDC to Mode (YEL).
3. Now activate the desired input.
4. Allow display to run for a few seconds, then remove power from Mode.

Master Reset

Performing a Master Reset returns all settings for the Tracer to the factory default configuration. **Note that this procedure must be initiated if the Control Module has either been repaired or replaced.**

1. Activate main power. Do not activate any inputs.
2. Ground the SYNC (GRY) wire. The Module will now scan the Tracer and restore the Factory default settings.
3. When the lighthouse nearest to the Control Module is on steady, the process is completed. The SYNC wire should now be disconnected from Ground.