Per OSHA 1926.503 it is the Turbo Cable owner’s responsibility to ensure that all workers using this system are thoroughly trained in its’ installation, use and limitations. It is also the owner’s responsibility to ensure a Fall Rescue Plan, including all necessary equipment, has been developed and all workers using this system are fully trained in the Anti-Fall Plan and prepared to execute a safe and timely Fall Rescue should the need arise.

Garlock provides this Operators’ Manual as a tool to help instruct the user/owner/worker in the proper use of this equipment. Garlock expects the reseller and equipment owner to make every effort to abide by OSHA 1926.503 and educate the worker in the proper use and limitations of the Turbo Cable System before putting it into service.

Keep this Manual with the Turbo Cable system at all times. New users should read the manual before installing the system.

It is the Turbo Cable system owner’s responsibility to ensure that all workers using this system are thoroughly trained. Provide all workers with this Operators’ Manual and make sure they understand its contents. Read it to them if necessary. Letting poorly trained workers install this system can result in property or machine damage and/or serious injury or death to personnel.

**WARNING!** THE TURBO CABLE SYSTEM IS DESIGNED FOR USE ON FLAT, LEVEL ROOFS ONLY. ANY OTHER USE CAN CAUSE INJURY OR DEATH TO INSTALLERS AND WORKERS.

**WARNING!** Before installing Turbo Cable on a roof, a competent professional must evaluate the roof edge structure to determine its ability to support the weight of the system plus all workers and other equipment that will be in the work area.

In addition, the roof edge structure must also withstand the forces (a 200 lb impact on the top Cable per OSHA 1926.502) imparted by the Turbo Cable System in the event a worker should fall against it.
WARNING! The Turbo Cable System is a Motion Stopping system.

No part of the Turbo Cable System is designed to be a tie-off anchor point for a lanyard, life-line or any other fall arrest mechanism. Do not attach any such item to any part of the Turbo Cable installation.

WARNING! Before beginning work on the roof, an install OSHA compliant Perimeter Guarding System around all roof edges and openings. This includes all skylights (whether they are left in place or removed) and any roof hatches which are left open or have been removed.

It is against Federal Law to leave these areas unguarded and may result in fines against the Contractor if any unguarded openings are on the roof.

In the event of injury or death of a worker due to falling from an unguarded edge or through an unguarded opening, legal prosecution may be brought against the Contractor, Equipment Owner and Building Owner.

WARNING! Working at or near the roof edge is dangerous and can subject the Worker to serious injury or death from falls. The roofing contractor and the worker must make every effort to ensure the area where he/she will be working is as safe as possible. This means taking only the tools you need to the roof edge, removing all trip hazards and loose material, the wearing and proper use of OSHA compliant Fall Arrest Devices, Harnesses and Life-Lines, making no sudden or unplanned moves and being constantly aware of your surroundings and your position/location relative to the roof edge.

It is also imperative that the Worker read the Operators’ Manual for this Turbo-Cable system and thoroughly understand how to set up and use this system. This includes knowledge of what the system can do and also how avoid situations this system was not designed to handle. Garlock provides this Operators’ Manual at the time of sale as a tool to help instruct the user/owner/worker in the proper use of the Turbo-Cable System and expects the reseller and owner/worker to make every effort to educate themselves before putting this system into service.
**Parts List:**

**End / Corner Base**
P/N 408105Z

**Line Wrap**
P/N 427977

**Wire Guide**
P/N 427967Z

**Lag Bolt**
3/16 x 2.50” Long
Box / 50 Pieces
P/N 101119

**Concrete Screw**
1/4” x 2.25” Long
Box / 50 Pieces
P/N 155648

**Anchor Shackle**
P/N 151972

**Wire Link**
P/N 408107

**1/4” Cable 225ft**
(220 / 440 systems)
P/N 153077

**1/4” Cable 275ft**
(540 system)
P/N 153077

**Warning Line**
P/N 153810

**Come-A-Long / Ratchet puller**
P/N 154081

**Mid Brace**
P/N 408113

**Cable Thimble Kit**
P/N 154079

**Lock Pin**
P/N 155102

**Anchor Shackle**
P/N 151972

**Force Scale (Optional)**
P/N 408108

**End / Corner Braces**
P/N 408110

**Force Scale (Optional)**
P/N 408108
WARNING! The Turbo Cable System must be installed according to the instructions outlined in this manual. Failure to do so could result in serious injury or death!

WARNING! To prevent serious injury or death, Installers of the Turbo Cable System must use OSHA-Approved Tie-Off device(s) during installation and removal of the system.

**System Installation:**

**Installation Tools Required:**

**General**
- 25ft Tape Measure

**Combo Clamp**
- 1–1/4” Wrench or Socket

**Lag Bolt**
- 1/2” Socket or Driver
- Drill
- 3/16” x 3” Long Drill Bit
- 5/16” Flat Washers, zinc plated

**Concrete Screw**
- 5/16” Socket or Driver
- Hammer Drill
- 3/16” x 3-1/2” Long Masonry Drill Bit
- 1/4” Flat Washers, zinc plated

**Thimble Kit**
- 1/2” Wrench or Deep Well Socket
**System Installation:**

**Step 1: Install the End/Corner Base (p/n 408105Z)**

Locate the End / Corner Base at end or corner of roof edge being guarded.

Note: Perimeters that are being fully enclosed can start and end on the same End / Corner assembly at a corner only. Therefore a rectangular roof only needs 4 End / Corner assemblies.

No minimum clearance is required* so the bases may be placed against walls or to the square edge of a corner.

A minimum of four (4) lag bolts / concrete anchors with appropriately sized flat washers are to be used to secure the End / Corner Base with at least one (1) lag bolt / concrete anchor at each end of the End / Corner Base.

To ensure a secure installation use only fasteners supplied by Garlock Safety Systems or their equivalent. See lag bolt and concrete anchor bullet points below.

A minimum of 1.50” of bite into continuous material is required for both lag bolts and concrete anchors.

Never install the End/Corner Assembly on insulation or any other equally thick, compressible material.

The vertical plate must be supported by either the vertical face of the wall or by using an offset block.

The holes in the vertical plate are not required to be used. They may be used to attach an offset block.

If the holes in the vertical plate are to be used for mounting the End Corner Base to the vertical surface, a minimum of 1.50” of penetration into the mounting surface is required for both lag bolts and concrete anchors.

**Lag Bolts Into Wood**

- 5/16” Diameter Lag Bolts are required.
- Zinc plated, Galvanized, or other corrosion resistant are required.
- The tip of the lag bolt must bite at least 1.50” into continuous material. You may be required to purchase longer Lag Bolts to ensure this bite.

Installations with a double wood nailer edge require 1.5” of penetration into the lower board.

Installations with a single wood nailer directly over concrete require fastening to the concrete for proper support.

**Concrete Anchors**

- 1000 lbs minimum pullout force required per concrete anchor.
- 1/4” or 5/16” Diameter Concrete Screws or Bolt Anchors are recommended.
- Zinc plated, Galvanized, or other corrosion resistant are required.

Follow installation instruction provided by the anchors manufacturer, architect, and building codes.

Holes on notch side of mounting plate are not recommended for use with concrete anchors.

(*) Concrete anchors should be installed at a distance that is 10x their diameter from an edge.
Step 2: Install End / Corner Stanchion (p/n 408106Z)

Before placing the End / Corner Stanchion into the End / Corner base, slide one Line Wrap (p/n 427977Z) between the upper two rings and another between lower two rings of the End/Corner Stanchion Tube.

Place Pin (p/n 155102) through the end holes of the Line Wraps. This prevents them from falling off during installation.

Use Pin (p/n 155102) to secure the End/Corner Stanchion Tube to the End/Corner Base being sure the pin in the upper Line Wrap is at least 42 but no more than 45 inches from roof (walking) surface. There are 2 holes on the End / Corner Stanchion and 5 holes on the End / Corner Base that allow the stanchion height to be set at 2 inch increments.

Make note of the holes used for pinning this assembly together. Using the same holes on the combo clamp will result in a level line.
System Installation: (continued)

**Step 3: Install Combo Clamp**

Locate first Clamp a maximum of 20 feet away from End / Corner assembly.

**Screw On Clamp**

Secure Clamp 1 (p/n 407441) to roof edge with a minimum of (4) 1/4" x 2" long Lag Bolts on Wood Cap OR a minimum (4) 1/4" x 2" Concrete Fasteners on Concrete Cap.

Be sure to install an equal number of fasteners on each side of the plate; for example 2 on the left and 2 on the right.

Use appropriately sized flat washers

Concrete anchors should be installed at a distance that is 10x their diameter from an edge.

**Parapet Clamp**

Place Clamp 1 (p/n 407441) over top of Parapet as shown.

Place Clamp 2 (p/n 407442) over Clamp 1 with keyhole slot fitting over the Pin to get Clamp 2 as close to Wall as possible. This can be done ahead of time to all Clamps to be used. Slot spacing is 2 inches.

Tighten Clamp using 1.25" wrench or driver

**Step 4: Install Stanchion (p/n 407495)**

Insert Stanchion into Clamp and lower it until top of Stanchion Tube is about 44 inches from roof (walking) surface. This will result in a 42” cable height.

There are 2 holes on Stanchion to choose for pinning and 5 holes on Clamp 1 to provide for 2 inch adjustment increments.

The location of the pinning holes are the same on the clamp as it is on the End / Corner Base
**System Installation: (continued)**

**Step 5:**

Continue locating and securing Clamps and Stanchions along roof edge to be guarded. Make sure they are no more than 20 feet apart.

When installing last Clamp Half and Stanchion of that section or run, remember to leave at least 10 feet of roof edge past Clamp Half for installing the End/Corner Base.

Install End/Corner Base and End/Corner Stanchion, no less than 10 feet from last Clamp Half and Stanchion.

Follow these procedures until the desired perimeter is laid out.

Note: Parameters which are to be fully enclosed can start and end on the same End / Corner assembly at a corner only. Therefore a rectangular roof only needs 4 End / Corner assemblies.

**Step 6: Install the Cable End**

Pull pin halfway out of line wrap on the End / Corner Stanchion.

Remove pin from Anchor Shackle (p/n 151972). Loop Shackle through cable end. Place shackle between Line Wrap ends and push pin through the open pin holes in the shackle and line wrap.

Repeat the process for the second line wrap on that End corner assembly

**Always use 2 separate cables.** Do not use 1 cable for both lines (double back)
**System Installation: (continued)**

**Step 7: Install the Cable at Stanchion**

From attached cable end unspool enough cable to get to the next stanchion.

With the half circle of Wire Guide (p/n 427967Z) pointed away from you rotate the wire guide until top angle is vertical. Slip cable through the neck and into the slot.

With the cable in the slot rotate the Wire Guide counter clock wise. Align the hole with the short tube of the stanchion. Squeeze the pop pins in with fingers and slide the wire guide over them until they pop back up.

Repeat these steps for the second short tube and every stanchion.

When installed correctly the cable should pass freely through the wire guide.

Wire guide is to be used upright as shown only.
System Installation: (continued)

Step 8: Install the Cable Around a Corner

Unspool enough cable to get from the last stanchion to the corner.

Loop the lower cable around the outside of the End / Corner Stanchion. Remove pin from the lower line wrap. Slide the wire through the lower and upper catch of the line wrap. Replace the pin in the line wrap.

Repeat this process for the upper cable.

When installed correctly the cable should pass freely through the Line Wrap.
System Installation: (continued)

Step 9: Installing the Cable, End Termination

Unspool enough cable to get about 10 feet from the last End /Corner Stanchion. This distance will vary with the amount of slack in the cable and total length on the run.

Attach ratchet end of Come-Along (p/n 154081) to the End /Corner Stanchion and reel the hook out until it attaches to the loop on the cable.

If the full length of the cable is not being used, Thimble Kit (p/n 154079) is to be installed on to the cable to create a closed loop

Warning: Do Not Tension or Tighten the Cable! Cable is to be tensioned only after braces are properly installed.

Repeat these steps for the 2nd cable.

When Cable Terminates at Corner Where it Started

Unspool enough cable to get about 10 feet from the last End /Corner Stanchion. This distance will vary with the amount of slack in the cable and total length on the run

Install Thimble Kit (p/n 154079) on to the cable as required

Attach ratchet end of Come-Along (p/n 154081) to the clevis and reel the hook out until it attaches to the thimble loop on the cable.

Warning: Do Not Tension or Tighten the Cable! Cable is to be tensioned only after braces are properly installed.

Repeat these steps for the 2nd cable.
**System Installation: (continued)**

**Step 10: Install End / Corner Braces**

Remove the pin from the Brace Pivot End of the End/Corner Brace (p/n 408110) and slip into one of the two middle pockets of the End/Corner Stanchions along roof edge.

Rotate the End/Corner Brace so that it is running roughly parallel to the cables. Making sure that the brace does not interfere with the cables, Come-Along, or the Force Scale. The brace will slightly angle away from the roof edge.

**Never install the brace opposite of the cable run.** Braces should always be “inline” with the cable.

Attach lower end of End/Corner Brace Diagonal Brace to Roof using 2 Lag Bolts / Concrete Anchors and appropriately sized flat washers, making sure you have at least 1 ½” of penetration into roof.

For corners install an 2nd brace in the open middle pocket following the directions given above.
System Installation: (continued)

Step 11: Install the Optional Force Scale (p/n 408108) with an End Termination

Unspool enough cable to get about 10 feet from the last End/Corner Stanchion. This distance will vary with the amount of slack in the cable and total length on the run.

Pull pin halfway out of line wrap on termination post.

Remove pin from Anchor Shackle (p/n 151972). Loop Shackle through an open end on the Force Gauge (p/n 408108).

Place shackle between Line Wrap ends and push pin through the open pin holes in the shackle and line wrap.

Attach ratchet end of Come-Along (p/n 154081) to the remaining open end of the Force Scale and reel the hook out until it attaches to the loop on the cable.

If the full length of the cable is not being used, Thimble Kit (p/n 154079) is to be installed on to the cable to create a closed loop.

**Warning: Do Not Tension or Tighten the Cable!** Cable is to be tensioned only after braces are properly installed.

Repeat these steps for the 2nd cable.
System Installation: (continued)

Installing the Optional Force Spring (p/n 408108) with Termination at the Install Corner

Unspool enough cable to get about 10 feet from the last End /Corner Stanchion. This distance will vary with the amount of slack in the cable and total length on the run

Install Thimble Kit (p/n 154079) on to the cable as required

Pull pin out of line wrap on termination post

Remove the Anchor Shackle (p/n 151972) . Loop Shackle through an open end on the Force Gauge (p/n 408108). Keeping the cable starting point on the anchor shackle. Place Shackle between Line Wrap ends and push pin through the open pin holes in the shackle and line wrap. Making sure the cable and Force Scale are not intertwined and that the cable end does not run under the force gauge end.

Attach ratchet end of Come-Along (p/n 154081) to the remaining open end of the Force Scale and reel the hook out until it attaches the loop on the cable.

If the full length of the cable is not being used, Thimble Kit (p/n 154079) is to be installed on to the cable to create a closed loop

Warning: Do Not Tension or Tighten the Cable! Cable is to be tensioned only after braces are properly installed.

Repeat these steps for the 2nd cable.
**System Installation: (continued)**

**Step 12: Tensioning the Cables**

After all the End/Corner Braces have been properly installed begin tensioning the cable with Come-Along checking to make sure the cables are not tangled or caught on anything. If needed reposition the Cable Thimble.

Pull cable tight enough that a 200lb load will cause the wire to sag no more than 6” over a 10 ft span.

**Note:** When tightened, the wire should make a noise when plucked, similar to a guitar or piano.

---

**Tensioning the Cables with Optional Force Scale**

After all the End/Corner Braces have been properly installed begin tensioning the cable with Come-Along checking to make sure the cables are not tangled or caught on anything. If needed reposition the Cable Thimble.

Cables will be at the correct tension when the arrow lines up with the ends on the Force Scale.

Too much force has been put into the system if the springs are fully collapsed. Back off the force until some separation between the coils is visible.

---

The Force Scale is a rudimentary measuring device and is not to be considered accurate. It is meant only to help indicate an operational band of tension between enough and too much.

Failure to use the correct amount of force may result in injury, damage to the system, or damage to the mounting structure (rooftop).

Always inspect the Force Scales for damage before each use. Failure of a spring, retaining bolt, or anchor point may result in severe injury, damage to the system, or damage to the mounting structure (rooftop).
System Installation: (continued)

Step 13: Install Midbraces (p/n 408113)

If the stanchions are spaced 12ft or further apart install mid braces halfway between them.

First loosen the wing nuts on the J bolts at the top and bottom. Hook each J bolt around the corresponding wire and tighten. So that the wing nuts are facing outward and the leg is landing on the parapet or deck.

Adjust the leg height by loosening the middle 2 wing bolts and sliding the leg to the appropriate height. Retighten the wing bolts.

Note: The mid braces are not required to be fastened to the mounting surface. The 2 holes in the foot are provided for use if desired by user.

Step 14: Install Wire Links (p/n 408107)

When the space between the mid braces and stanchions is greater than 6ft wire links should be installed at the halfway point.

Loosen the wing nuts on the J bolts at the top and bottom hook each J bolt around the corresponding wire and tighten with the wing nuts are facing outward away from the working surface.
System Installation: (continued)

On long Installations, such as 440 and 540 ft Kits, the Cable will need to be spliced together using the Double Cable Clevis (p/n 154080) supplied with the Kit. Your Cable comes with a large Cable Eye on one end and a small Cable Eye in the other end. When installing Cable, the Large Eye end is used at the first End / Corner Stanchion with the Small Eye being located at the middle of the installation. Using the Double Clevis, join the Small Cable Eye from the first Reel to the Large Cable Eye from the new Reel in the center of your Installation. Continue stringing out cable to the termination End / Corner Stanchion and install as previously directed.
Distributed by
CAI Safety Systems
555 Monica Circle
Corona, CA 92880
Phone: 951.272.6999
Toll-Free: 888.246.6999
Fax: 951.272.8066
info@caisafety.com
Website: caisafety.com