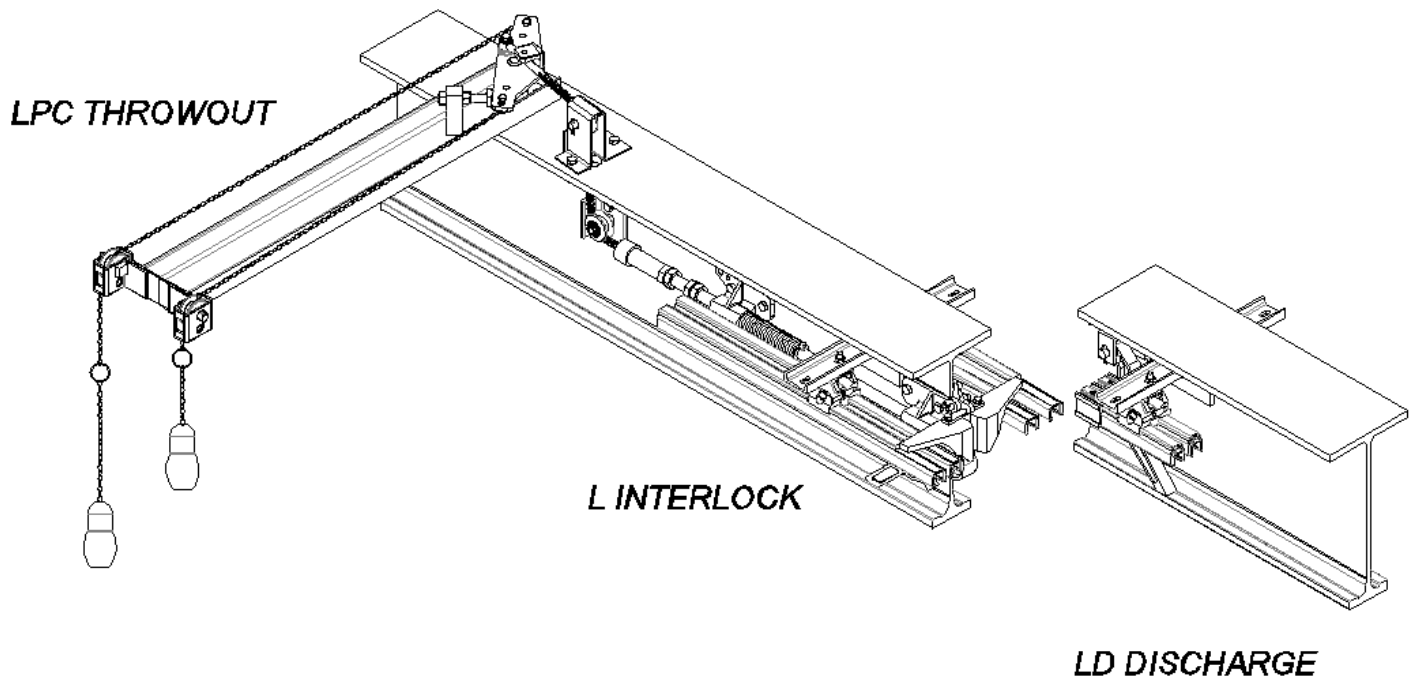


Installation, Operation, & Maintenance Manual



**IMPORTANT!
DO NOT DESTROY**

L Interlock, LPC Throwout & LD Discharge Point

Gorbel® Customer Order No. / Serial No. _____

Gorbel® Dealer _____

Issued: 02/2013
Revised: 08/2018

Date _____
Month _____ Year _____

TABLE OF CONTENTS

| | |
|---|------|
| Introduction..... | 1 |
| General Notes for L Interlock / LD Discharge Assembly | 2 |
| Installation | |
| Step 1 - Pre-assembly | 2 |
| Step 2 - L Interlock and LPC Throwout Installation | 3-6 |
| Step 3 - LD Discharge Point Installation..... | 7-8 |
| Step 4 - Electrification (Safpowrbar®) Installation | 9-10 |
| Step 5 - Gooseneck Support Installation | 11 |
| Step 6 - Automatic Latch Kit Installation..... | 12 |
| Step 7 - Motor Operator Installation..... | 13 |
| Crane Operator / Start Up Instructions | 14 |
| General Safety Requirements | 14 |
| Limited Warranty | 15 |

Questions? Concerns? Comments? Please call (800) 821-0086

INTRODUCTION

Thank you for choosing Cleveland Tramrail® L Interlocks & LD Discharge Points to solve your material handling needs. The innovative design and heavy-duty construction of the Cleveland Tramrail® Interlocks and Discharge Points will provide a superior quality product that will offer years of long term value. Cleveland Tramrail® Interlocks and Discharge Points will provide many years of dependable service by following the installation and maintenance procedures described herein.

Gorbel® products are shipped in various stages of assembly and are installed under varying circumstances. As a result, a complete guide with descriptions covering all variations is not possible. The following instructions are only to be used as a general guide. Attention should be paid to the warnings and safety suggestions posted in this manual and on the equipment.

Gorbel currently supports Cleveland Tramrail® L Interlocks and LD Discharge Assemblies on 10" and larger Tarca®. If assembly or repair parts for 8" or 8-1/2" Tarca® is required, please consult Gorbel® factory.

In most cases, the components outlined in these instructions will be factory assembled, requiring only minor adjustment during installation. However these instructions will cover field assembly and adjustment of an L Interlock with LPC Throwout and LD Discharge Point.

In order to properly assemble the mechanisms, carefully study the detail prints and determine the location of the various parts and tools that may be required.

Dimensions contained in this installation manual are for reference only and may differ for your particular application.

Normal safety precautions: These include, but are not limited to:

- Checking for obstructions in travel
- Checking that all bolts and threaded rods are tight and have lock washers
- For additional safety precautions, see page 14.

WARNING

Please read entire manual prior to starting installation.

WARNING

Gorbel Inc. assumes no responsibility for adequacy or integrity of the mounting surfaces or the structure that the crane may be mounted to. Gorbel Inc. will not be liable for any loss, injury or damage to persons or property, nor for damages of any kind, resulting from the failure or defective operation of any materials not supplied directly by Gorbel Inc. Bracing systems, if used, must be approved by a local professional engineer.

WARNING

Before installing any crane system, it is critical you determine that your building will safely support the loads.

WARNING

Equipment described herein is not designed for, and should not be used for, lifting, supporting or transporting humans. Failure to comply with any one of the limitations noted herein can result in serious bodily injury and/or property damage. Check State and Local regulations for any additional requirements.

WARNING

Crane cannot be utilized as a ground: A separate ground conductor is required. For example, systems with 3 phase power require three conductors plus one ground conductor.

WARNING

Reference the American Institute of Steel Construction (AISC) Manual of Steel Construction Specification for Structural Joints using ASTM A325 or A490 Bolts, Installation, Pretensioned Joints, Calibrated Wrench Pretensioning for the proper procedures to follow when using any torque tightening method.

GENERAL NOTES FOR L INTERLOCK/LD DISCHARGE ASSEMBLY

1. Safpowrbar® can only be mounted in the low position.
2. Maximum trolley wheel diameter is 5”.
3. Maximum capacity is 5 tons.
4. Consult factory for bridge to bridge interlocking.
5. Guide rollers are recommended on carriers.
6. Minimize cantilevers for best performance.
7. If using another manufacturer’s hoist trolley (not Cleveland Tramrail®) it is the responsibility of others to guarantee that the carrier/trolley clears the interlock and discharge components without interfering with operation, as well as correctly impacting the safety stops.

INSTALLATION

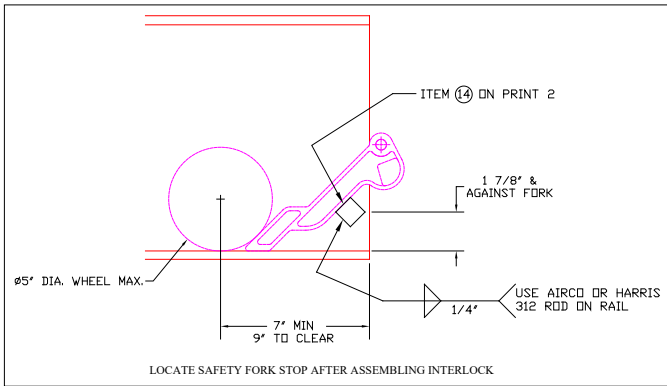
STEP 1 - PRE-ASSEMBLY

➡ **TIP:** Packing list can be found in envelope attached to hardware box: General Arrangement Drawing can be found inserted in this installation manual.

- 1.1 Read entire installation manual **before** you begin installing your interlock.
- 1.2 Study all instructions and drawings provided in this manual.
- 1.3 Check all hole punchings, beam dimensions and suspension fittings prior to installation.
- 1.4 Check packing list to make sure correct quantity of parts is included. Any missing items should be noted and reported to a Gorbel® dealer.
- 1.5 Tools and materials typically needed to assemble interlock/discharge are as follows:
 - Mallet
 - Tape measure
 - Hand tools
 - Clamps (large C)
 - Spud wrench
 - Leveling tools (transit, laser level, water level, etc.)
 - Lifting device to lift heavy objects
 - Welder (if splices are welded)
 - Torque wrench
 - Steel shims
 - Ladders/man lifts
 - Large square
 - Shop brush

STEP 2 - L INTERLOCK AND LPC THROWOUT INSTALLATION

2.1 Refer to **diagram 2A** if preparing a beam in the field to accept an L interlock. Drill beam accordingly. Do not weld safety fork stops until after the L interlock and LPC throwout have been completely installed to beam.



L INTERLOCK BEAM PREPARATION FOR 10" AND LARGER TARCA BEAM
 REFERENCE PRINT 4K-17970-1 FOR ADDITIONAL OPTIONS

ALL HOLES ARE Ø7/16" UNLESS OTHERWISE SPECIFIED.

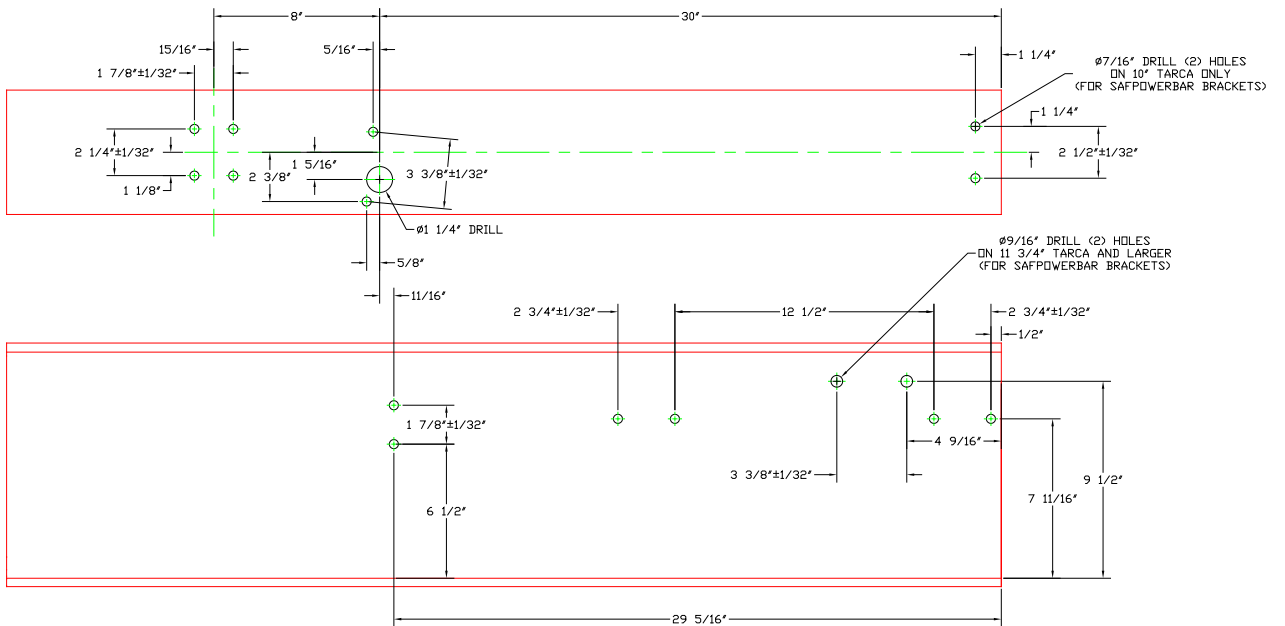
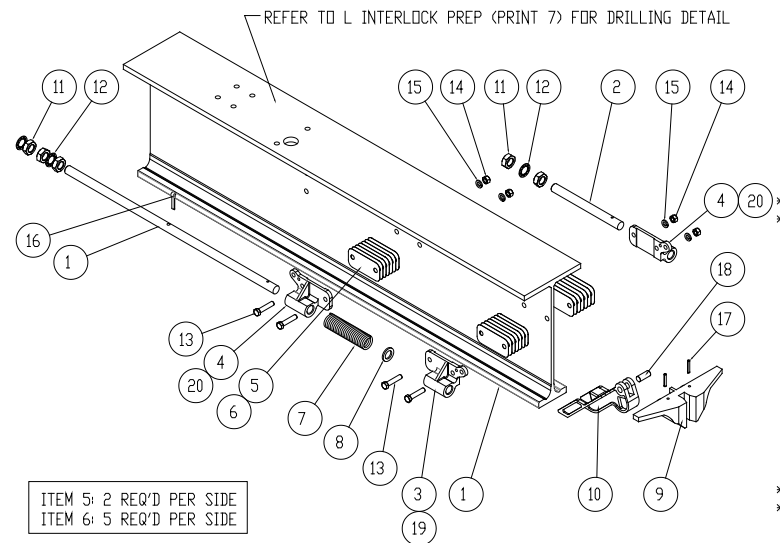


Diagram 2A.

STEP 2 - L INTERLOCK AND LPC THROWOUT INSTALLATION (CONTINUED)



| TYPE L INTERLOCK SUB ASSEMBLY 1-17948-106 | | | |
|---|-------------|-------------------------------------|------|
| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
| 1 | 1-16261-100 | SLIDE ROD (K-16261-1) | 1 |
| 2 | 1-16261-200 | SLIDE ROD (K-16261-2) | 1 |
| 3 | 1-04219-400 | SLIDE ROD GUIDE (2K-4219-D) | 1 |
| 4 | 1-04220-400 | SLIDE ROD GUIDE (2K-4219-D) | 2 |
| 5 | 1-14767-100 | SHIMS (K-14767-A) | 6 |
| 6 | 1-14767-200 | SHIMS (K14767-B) | 15 |
| 7 | 1-10638-000 | SLIDE ROD COIL SPRING (K-10638) | 1 |
| 8 | 1-02025-000 | COIL SPRING STOP (K-2025) | 1 |
| 9 | 1-16257-000 | LATCH NOSE (3K-16257) | 1 |
| 10 | 1-16265-000 | SAFETY FORK (3K-16265) | 1 |
| 11 | 0-74212-602 | 3/4-10 UNC 2B JAM NUT | 5 |
| 12 | T-28033-212 | 3/4" INTERNAL TOOTH LOCKWASHER | 3 |
| 13 | T-28011-214 | 3/8 -16 UNC 2A H.H.C.S. 1 3/4" LONG | 4 |
| 14 | T-28005-206 | 3/8"-16 UNC 2B HEX NUT | 4 |
| 15 | T-28003-206 | 3/8" SPRING LOCKWASHER | 4 |
| 16 | 0-74607-482 | 1/4" COTTER PIN, 1 1/2" LONG | 2 |
| 17 | 0-74680-400 | 3/16" ROLL PIN, 1 1/4" LONG | 2 |
| 18 | 0-74676-012 | 1/2" ROLL PIN 1 1/4" LONG | 1 |
| * 19 | 1-04219-500 | SLIDE ROD GUIDE (2K-4220-E) | 1 |
| * 20 | 1-04220-500 | SLIDE ROD GUIDE (2K-4219-E) | 2 |

* USE (19) & (20) FOR TARCA WITH 7/16" OR 1/2" WEB THICKNESS OMIT ITEMS (1) & (2)

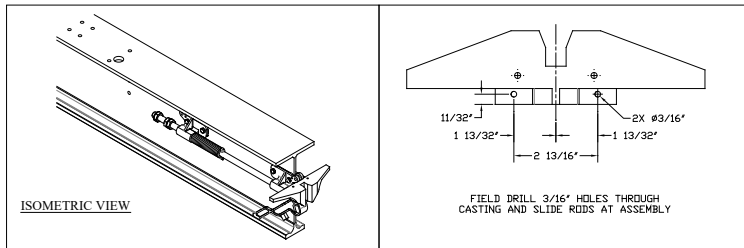
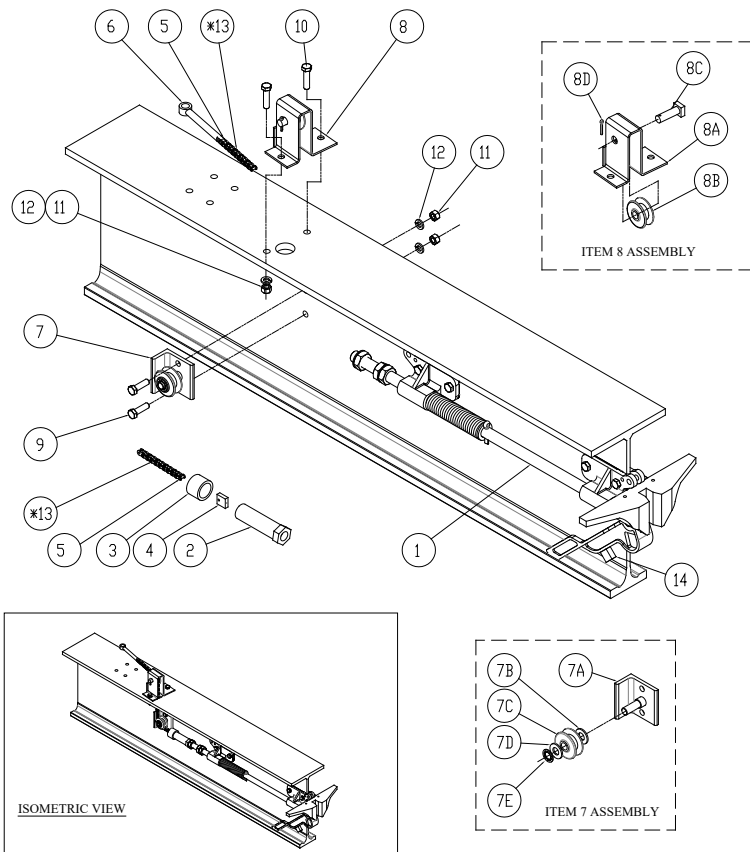


Diagram 2B.

Refer to Diagram 2B

- 2.2 Mount on girder one pair of outer slide rod guides (items 3 and 4) and a single inner slide rod guide (item 4). Shim equally on both sides of web to 2-13/16" rod centers. Number of shims (items 5 and 6) will depend on web thickness of Tarca® beam.
- 2.3 Attach latch nose (item 9) to slide rods (items 1 and 2) using roll pins (item 17). This will require field drilling two 3/16" holes through latch nose casting (item 9) and slide rods. Attach safety fork (item 10) to latch nose using roll pin (item 18). Insert interlock slide rods through slide rod guides previously installed. If the slide rods do not move freely, adjust shims.
- 2.4 Pull the latch nose forward so that the longer of the two slide rods (item 1) is out of the inner guide. Install cotter pin (item 16) into the slide rod. Place spring stop (item 8) and coil spring (item 7) on the slide rod and push the slide rod back through the inner slide rod guide.
- 2.5 Screw jam nut (item 11) onto slide rod (item 1) until back of latch nose is 1-5/8" from the end of the girder. Fasten in place with lock washer (item 12) and additional jam nut (item 11). Screw jam nut (item 11) onto slide rod (item 2) until nut is seated against slide rod guide and lock in place with lock washer (item 12) and additional jam nut (item 11). Save final jam nut (item 11) and lock washer (item 12) for attaching components in **diagram 2C**, page 5.

STEP 2 - L INTERLOCK AND LPC THROWOUT INSTALLATION (CONTINUED)



| TYPE L INTERLOCK ASSEMBLY 1-17967-LLL | | | | |
|---------------------------------------|---------------|--|--|---|
| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. | |
| 1 | 1-17948-106 | SUB-ASSY: FORKS, RODS, SPRINGS, ECT (7/16"-1/2" WEB) | 1 | |
| 1 | 1-17948-106-A | SUB-ASSY: FORKS, RODS, SPRINGS, ECT (3/8" OR LESS WEB) | 1 | |
| 2 | 1-17955-200 | CHAIN ATTACHMENT | 1 | |
| 3 | 1-23629-000 | PIPE CAP | 1 | |
| 4 | 1-23628-000 | ROLLER CHAIN END PLATE | 1 | |
| 5 | 0-70860-100 | CONN LINK 3/8" SPRING LOCK | 2 | |
| 6 | 1-23630-000 | ROLLER CHAIN END FITTING | 1 | |
| 7 | 1-17972-100 | SHEAVE ASSY., WEB MOUNTED | 1 | |
| 7A | 1-17953-000 | SHEAVE BRACKET | 1 | |
| 7B | 0-79261-210 | 1/2" SAE FLAT WASHER | 1 | |
| 7C | 1-08781-100 | K-8781-1 SHEAVE | 1 | |
| 7D | 1-08605-000 | K-8605 WASHER | 1 | |
| 7E | 0-74201-600 | TINNERMAN C15718-025-27 | 1 | |
| 8 | 1-17971-100 | SHEAVE ASSY., TOP FLANGE MOUNTED | 1 | |
| 8A | 1-17951-001 | 2K-17951 SHEAVE BRACKET | 1 | |
| 8B | 1-08781-100 | K-8781-1 SHEAVE | 1 | |
| 8C | 1-08820-000 | K-8820 SHEAVE PIN | 1 | |
| 8D | 0-74605-720 | 1/8" COTTER PIN | 1 | |
| 9 | T-28011-210 | 3/8" - 16 HEX HEAD CAP SCREW, 1 1/4" LONG | 2 | |
| 10 | T-28011-212 | 3/8" - 16 HEX HEAD CAP SCREW, 1 1/2" LONG | 2 | |
| 11 | T-28005-206 | 3/8" - 16 HEX NUT | 4 | |
| 12 | T-28003-206 | 3/8" LOCK WASHER | 4 | |
| 13 | 1-17957- | CHAIN LENGTH, #35 ROLLER | 1 | |
| ** | 14 | 1-17973-000 | SAFETY FORK STOP, 10"-11 3/4" TARCA | 2 |
| ** | 14 | 1-17973-100 | SAFETY FORK STOP, 12 1/2" AND UP TARCA | 2 |

* ROLLER CHAIN NOT (SHOWN IN EXPLODED VIEW) TRAVELS FROM ITEM 7 WRAPING CLOCKWISE UNDER SHEAVE 7 THROUGH THE TOP FLANGE OF BEAM AND COUNTER CLOCKWISE OVER SHEAVE 8 BEFORE ATTACHING TO ITEM 6

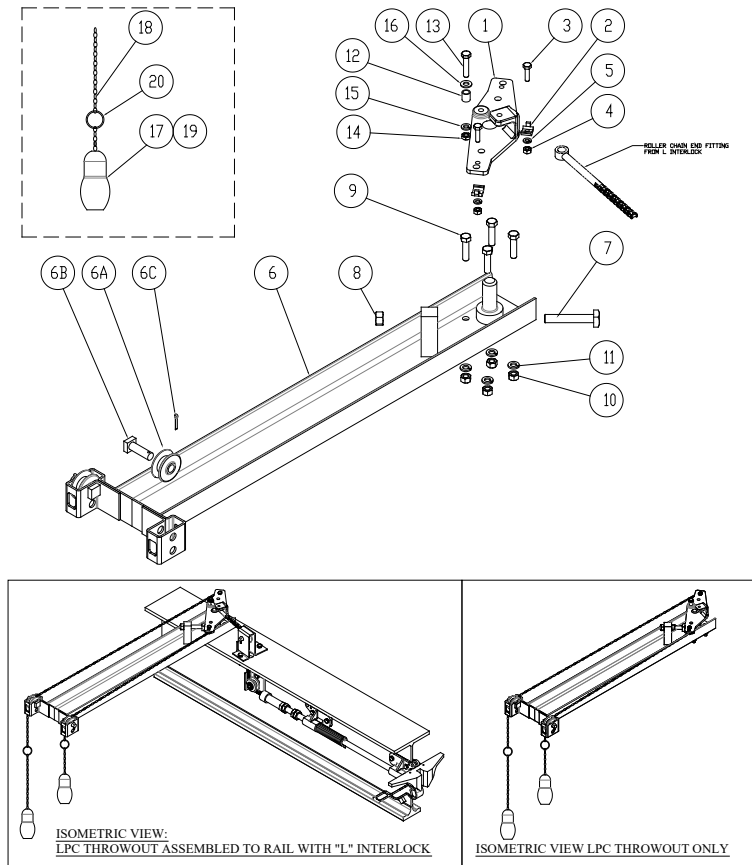
** REFER TO L INTERLOCK PREP (PRINT 7) FOR SAFETY FORK STOP LOCATION AND WELDING DETAIL.

Diagram 2C.

Refer to Diagram 2C

- 2.6 Attach sheave assembly (item 7) to web using bolts (item 9) and lock washers and hex nuts (items 11 and 12). Attach sheave assembly (item 8) to top flange using bolts (item 10) and lock washers and hex nuts (items 11 and 12).
- 2.7 Loosely connect chain attachment (item 2) to slide rod using the left over jam nut (item 11) and lock washer (item 12) from **diagram 2B**, page 4. **Do not tighten lock nut at this time.**
- 2.8 Attach chain end fitting (item 6) to chain (item 13) using connecting link (item 5). Reeve opposite end of chain over the top of sheave (item 8) through the top flange hole and pass under sheave (item 7).
- 2.9 Pass chain (item 13) through pipe cap (item 3) and attach to end plate (item 4) using connecting link (item 5). Attach pipe cap (item 3) to chain attachment (item 2) to finish interlock assembly.

STEP 2 - L INTERLOCK AND LPC THROWOUT INSTALLATION (CONTINUED)



| TYPE LPC THROWOUT ASSEMBLY 1-17963-000 | | | |
|--|-------------|--|------|
| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
| 1 | 1-17950-100 | CRANK LEVER | 1 |
| 2 | 1-05449-000 | CHAIN ANCHOR | 2 |
| 3 | T-28011-008 | 1/4" - 20 HEX HEAD CAP SCREW, 1" LONG | 2 |
| 4 | T-28005-204 | 1/4" - 20 HEX NUT | 2 |
| 5 | T-28003-204 | 1/4" LOCK WASHER | 2 |
| 6 | 1-17961-000 | SUPPORT BASE ASSEMBLY | 1 |
| 6A | 1-08781-100 | SHEAVE | 2 |
| 6B | 1-08820-000 | SHEAVE PIN | 2 |
| 6C | 1-17965-000 | 1/8" COTTER PIN | 2 |
| 7 | 0-75884-700 | 1/2" - 13 SQUARE HEAD SET SCREW, 3" LONG | 1 |
| 8 | T-28005-208 | 1/2" - 13 HEX NUT | 1 |
| 9 | T-28011-208 | 3/8" - 16 HEX HEAD CAP SCREW, 1 1/2" LONG | 4 |
| 10 | T-28005-206 | 3/8" - 16 HEX NUT | 4 |
| 11 | T-28003-206 | 3/8" LOCK WASHER | 4 |
| 12 | 1-17959-000 | SLEEVE | 1 |
| 13 | T-28011-112 | 5/16" - 18 HEX HEAD CAP SCREW, 1 1/2" LONG | 1 |
| 14 | 0-74212-000 | 5/16" - 18 HEX JAM NUT | 1 |
| 15 | T-28003-205 | 5/16" LOCK WASHER | 1 |
| 16 | T-28002-205 | 5/16" FLAT WASHER | 1 |
| 17 | 2-02174-000 | CHAIN HANDLE | 2 |
| 18 | 2-02176-000 | SWITCH CHAIN | 2 |
| 19 | 2-02176-100 | SPLICE LINK | 2 |
| 20 | 1-09675-000 | CHAIN RING | 2 |

*2 PCS 13' LONG ARE STANDARD FOR 8' APPROXIMATE DROP FROM BOTTOM OF TRACK

Diagram 2D.

Refer to Diagram 2D

- 2.10 Attach LPC throwout assembly to top flange using bolts (item 9) and lock washers and hex nuts (items 10 and 11). If necessary, use **diagram 2D** to assemble any loose components to complete the throwout.
- 2.11 With the throwout in the unlatched position (opposite of **diagram 2D** isometric view), attach the chain end (item 6, **diagram 2C**, page 5) to the crank lever (item 1) using bolt (item 13), sleeve (item 12), hex nut (item 14), lock washer (item 15) and flat washer (item 16). The chain end will be underneath the raised part of the casting of crank lever (item 1) when in the latched position, as shown in isometric view.
- 2.12 Set the throwout to the latched position and adjust set screw (item 7) so that the center line of the roller chain is beyond the center of the throwout pivot pin. Lock set screw (item 7) in place with hex nut (item 8). Adjust chain attachment (item 2, **diagram 2C**, page 5) so that the latch nose (item 9, **diagram 2B**, page 4) is tight against the end of the girder.
- 2.13 Operate the throwout to see that it functions properly. To secure proper operation, make any final adjustments and tighten lock nuts on all adjustable components.
- 2.14 Set throwout to the unlatched position (latch nose fully retracted) and using **diagram 2A**, page 3, weld safety fork stops to web of beam.

STEP 3 - LD DISCHARGE POINT INSTALLATION

3.1 Refer to **diagram 3A** or **3B** if preparing a beam in the field to accept an LD discharge point. Cut, drill and weld beam per **diagram 3A** or **3B** depending on Tarca® size being used.

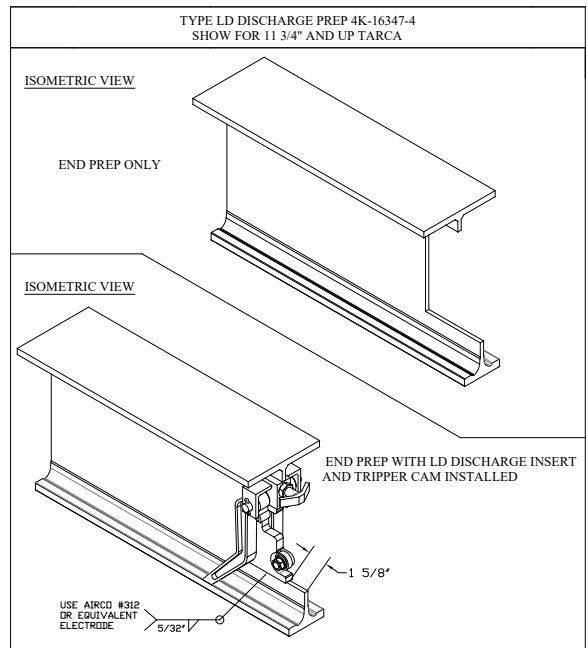
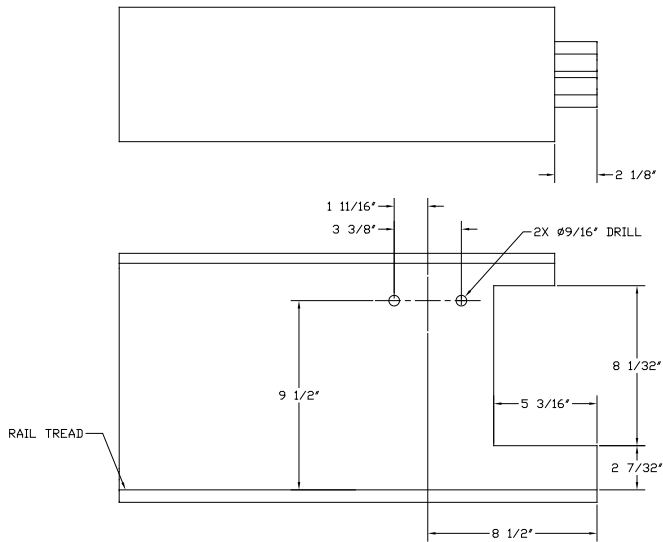


Diagram 3A.

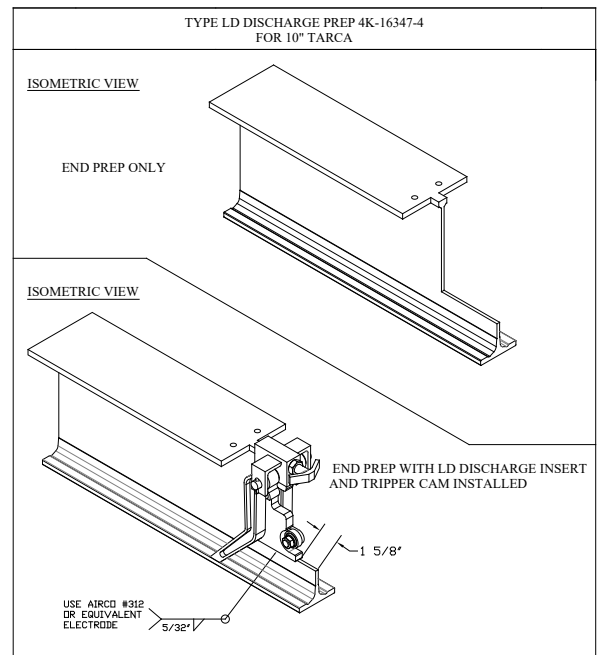
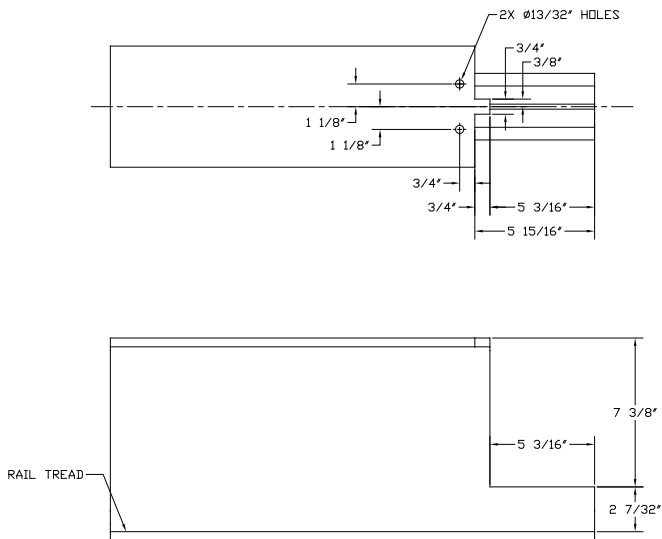


Diagram 3B.

STEP 3 - LD DISCHARGE POINT INSTALLATION (CONTINUED)

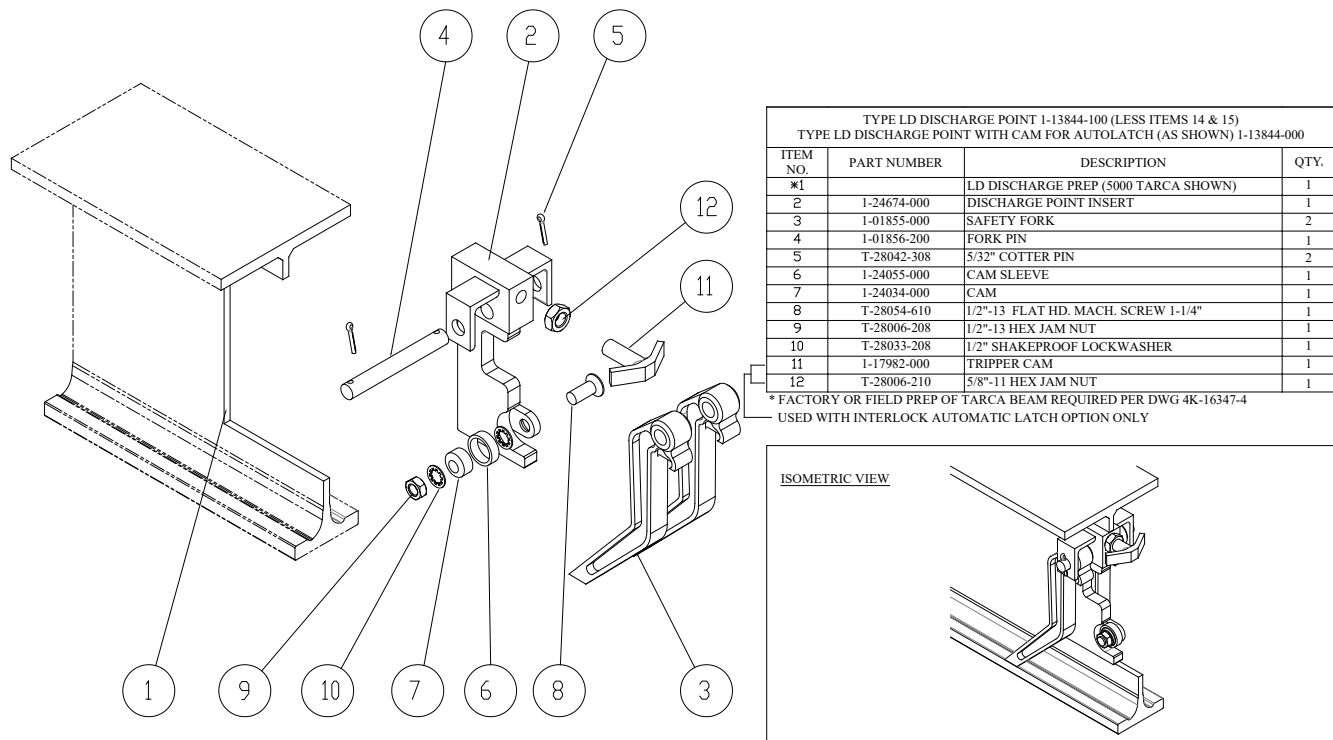


Diagram 3C.

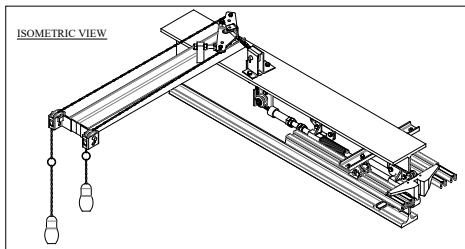
Refer to Diagram 3C

- 3.2** Install LD discharge point after the transfer crane with the L interlock is fully installed and mounted on the runway. It is recommended that LD discharge be factory installed to the transfer beam to ensure correct alignment. If field installation is required, **diagram 3C** will show how the discharge point is assembled and print 4K-16347-4 will show the required beam prep and weld requirements.
- 3.3** When installing the transfer beam with the factory installed LD discharge point, there should be a clearance from 3/16" to 5/16" between the end of the bridge girder with the L interlock and the transfer beam with the LD discharge point. The tread of the two tracks must be aligned and level.
- 3.4** If field installing LD discharge point ensure the end of the discharge point insert (item 2) is exactly 1-5/8" from the end of the track. This dimension and the clearance between the ends of the track must be measured carefully; otherwise the latch nose on the interlock will not lift the safety forks (item 3, **diagram 3C**, and item 10, **diagram 2B**, page 4) high enough to clear the wheels on the carrier.
- 3.5** There is only one adjustment on the LD discharge point. With the transfer crane and transfer beam aligned, latch the interlock and adjust the cam (item 7) so the interlock safety forks (item 10, **diagram 2B**, page 4) raise high enough to clear the carrier wheels.

STEP 4 - ELECTRIFICATION (SAFPOWRBAR®) INSTALLATION

Refer to Diagrams 4A and 4B for 11-3/4" Tarca® and larger
 Refer to Diagrams 4C and 4D, page 10, for 10" Tarca®

4.1 The only standard option for electrification across an L interlock is Safpowrbar®. Using **diagrams 4A** through **4D** to assemble the required components, electrification can be added to the L interlock and LD discharge point.



FOUR BAR SAFPOWRBAR SHOWN ON 12 1/2" TARCA IN A 2X2 ARRANGEMENT. ADDITIONAL ARRANGEMENTS AND NUMBER OF BARS ARE AVAILABLE.

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|---------------------------------------|------|
| 1 | 1-17967-LLL | L INTERLOCK (SHOWN WITH LPC THROWOUT) | 1 |
| 2 | 1-18104-530 | CONDUCTOR BAR BRACKET | 2 |
| 3 | T-28011-212 | 3/8"-16 X 1-1/2" HHCS, PLATED | 2 |
| 4 | T-28003-206 | 3/8" LOCKWASHER, PLATED | 2 |
| 5 | T-28005-206 | 3/8"-16 HEX NUT, PLATED | 2 |
| 6 | 1-06750-630 | STUD BRACKET PACKAGE | 2 |
| 7 | 2-05151-000 | DOUBLE INSULATOR ASS'Y | 2 |
| 8 | 1-18023-400 | CONDUCTOR BAR END | 4 |

4.2 The conductor bar on the L interlock end shall extend 3-11/16" beyond the end of the girder. The face of the flared end fitting on the LD discharge must be placed 11/16" from the face of the bar on the L interlock side. For additional information about installing Safpowrbar® and its components, refer to the Safpowrbar® Installation Manual.

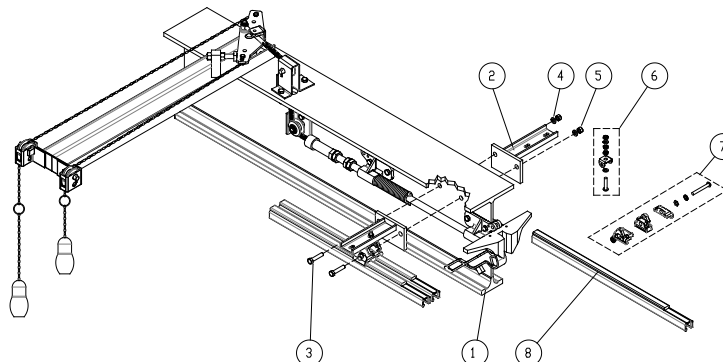
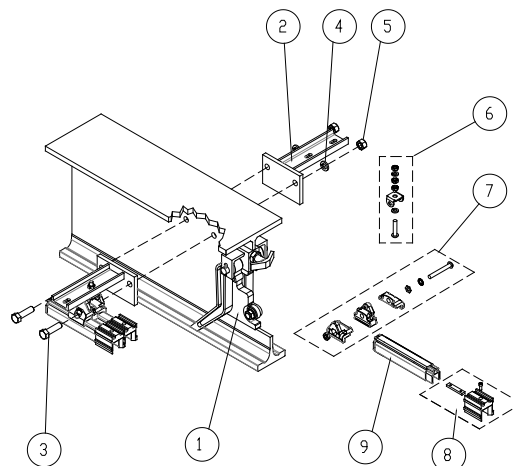


Diagram 4A.



FOUR BAR SAFPOWRBAR SHOWN ON 12 1/2" TARCA IN A 2X2 ARRANGEMENT. ADDITIONAL ARRANGEMENTS AND NUMBER OF BARS ARE AVAILABLE.

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|---------------------------------------|------|
| 1 | 1-13844-000 | LD DISCHARGE POINT (5000 TARCA SHOWN) | 1 |
| 2 | 1-18104-530 | CONDUCTOR BAR BRACKET | 2 |
| 3 | T-28011-212 | 3/8"-16 X 1-1/2" HHCS, PLATED | 2 |
| 4 | T-28003-206 | 3/8" LOCKWASHER, PLATED | 2 |
| 5 | T-28005-206 | 3/8"-16 HEX NUT, PLATED | 2 |
| 6 | 1-06750-630 | STUD BRACKET PACKAGE | 2 |
| 7 | 2-05151-000 | DOUBLE INSULATOR ASS'Y | 2 |
| 8 | 1-18440-200 | PLASTIC GUIDE, FLARED END FITTING | 4 |
| 9 | 2-05193-210 | *SAFPOWRBAR (GALVANIZED) 10FT LONG | - |

GALVANIZED STEEL, COPPER AND STAINLESS STEEL SAFPOWRBAR AVAILABLE IN 2 1/2 FT LENGTHS.

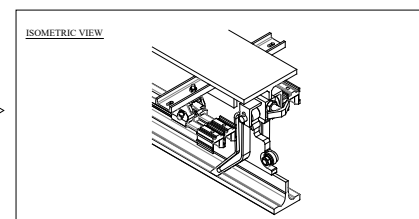
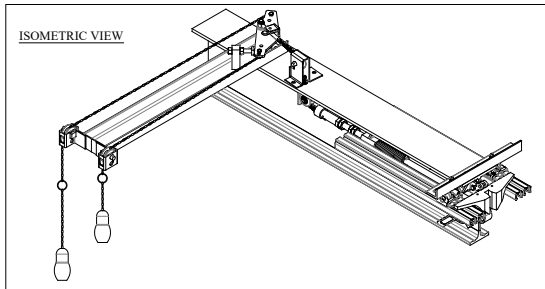


Diagram 4B.

STEP 4 - ELECTRIFICATION (SAFPOWRBAR®) INSTALLATION (CONTINUED)



FOUR BAR SAFPOWRBAR SHOWN ON 10" TARCA IN A 2X2 ARRANGEMENT. ADDITIONAL ARRANGEMENTS AND NUMBER OF BARS AVAILABLE.

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|---------------------------------------|------|
| 1 | 1-17967-LLL | L INTERLOCK (SHOWN WITH LPC THROWOUT) | 1 |
| 2 | 1-18054-400 | CONDUCTOR BAR BRACKET | 2 |
| 3 | T-28011-210 | 3/8"-16 X 1-1/4" HHCS, PLATED | 2 |
| 4 | T-28003-206 | 3/8" LOCKWASHER, PLATED | 2 |
| 5 | T-28005-206 | 3/8"-16 HEX NUT, PLATED | 2 |
| 6 | 1-06750-630 | STUD BRACKET PACKAGE | 2 |
| 7 | 2-05151-000 | DOUBLE INSULATOR ASS'Y | 2 |
| 8 | 1-18023-400 | CONDUCTOR BAR END | 4 |

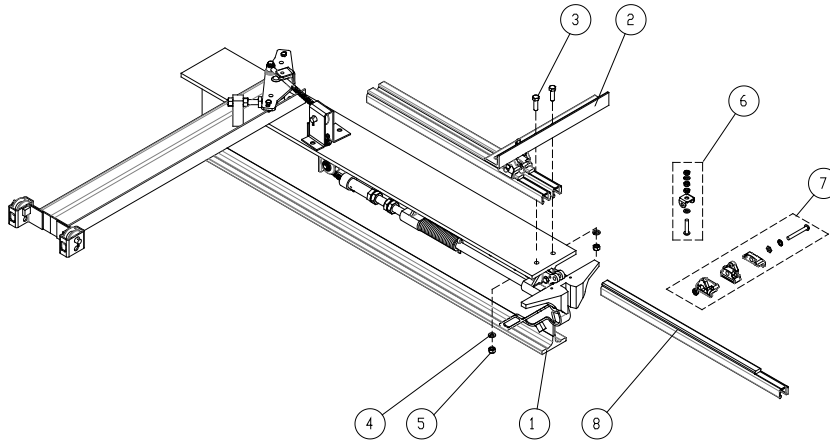
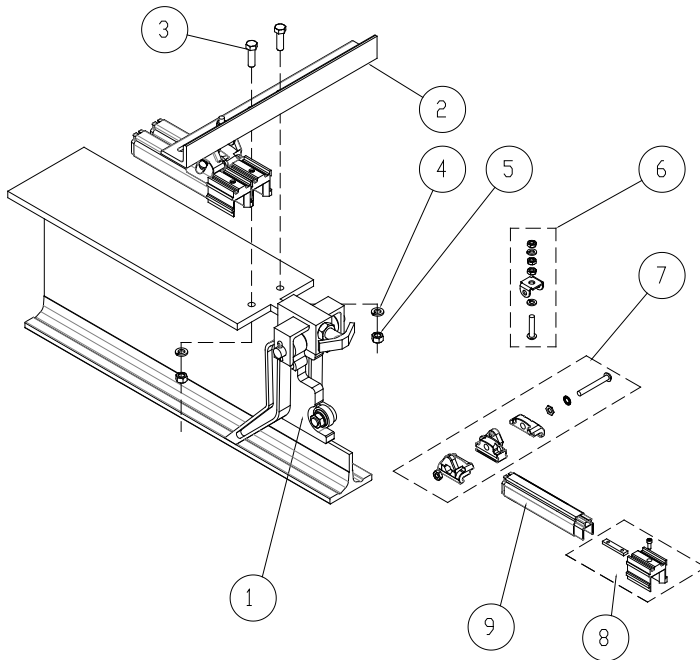


Diagram 4C.



FOUR BAR SAFPOWRBAR SHOWN ON 10" TARCA IN A 2X2 ARRANGEMENT. ADDITIONAL ARRANGEMENTS AND NUMBER OF BARS AVAILABLE.

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|---------------------------------------|------|
| 1 | 1-13844-000 | LD DISCHARGE POINT (5000 TARCA SHOWN) | 1 |
| 2 | 1-18054-400 | CONDUCTOR BAR BRACKET | 1 |
| 3 | T-28011-210 | 3/8"-16 X 1-1/4" HHCS, PLATED | 2 |
| 4 | T-28003-206 | 3/8" LOCKWASHER, PLATED | 2 |
| 5 | T-28005-206 | 3/8"-16 HEX NUT, PLATED | 2 |
| 6 | 1-06750-630 | STUD BRACKET PACKAGE | 2 |
| 7 | 2-05151-000 | DOUBLE INSULATOR ASS'Y | 2 |
| 8 | 1-18440-200 | PLASTIC GUIDE, FLARED END FITTING | 4 |
| 9 | 2-05193-210 | *SAFPOWRBAR (GALVANIZED) 10FT LONG | - |

GALVANIZED STEEL, COPPER AND STAINLESS STEEL SAFPOWRBAR AVAILABLE IN 21FT LENGTHS.

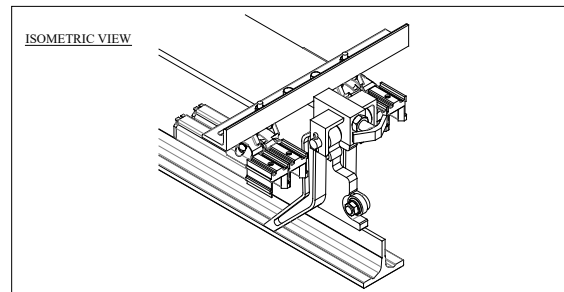


Diagram 4D.

STEP 5 - GOOSENECK SUPPORT INSTALLATION

EXAMPLE OF A GOOSENECK SUPPORT FOR AN INTERLOCKING TRANSFER CRANE

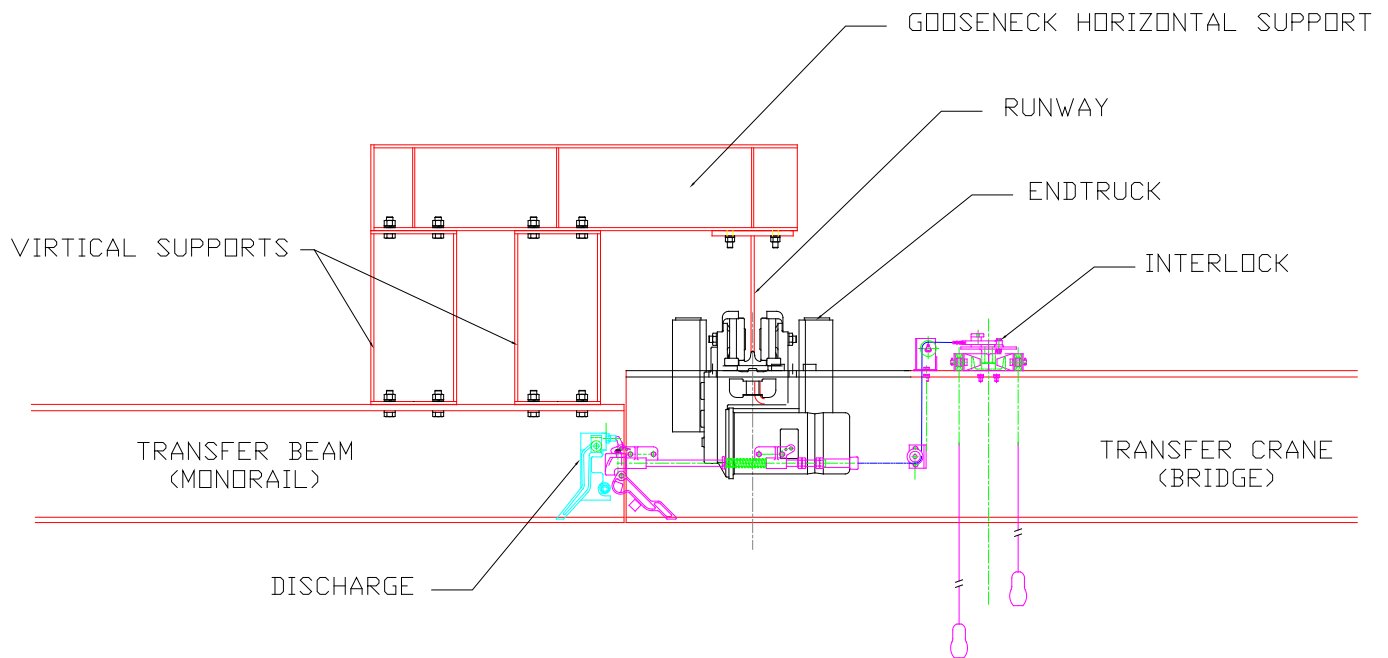
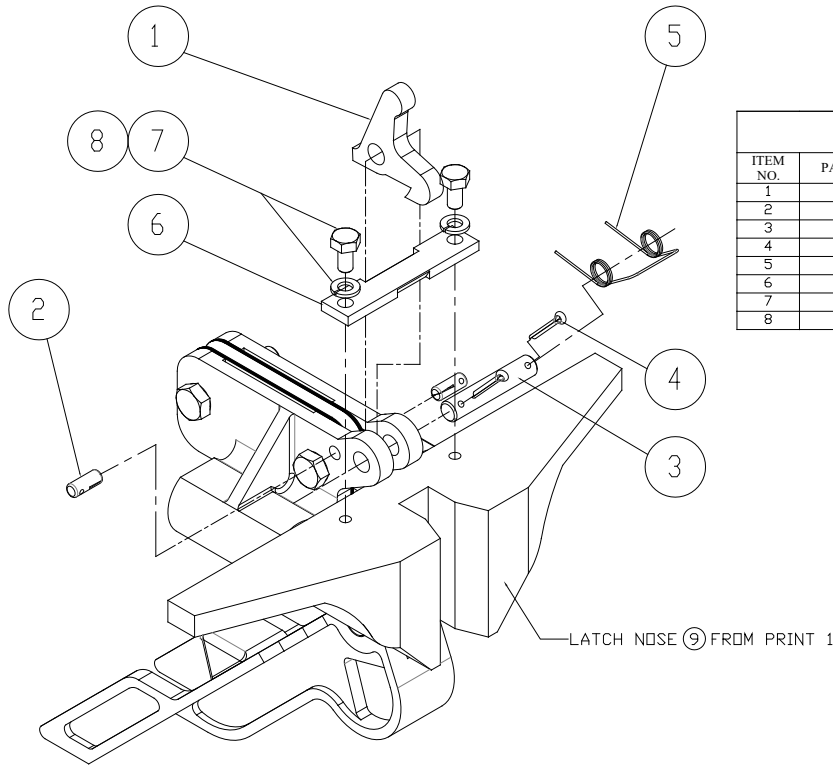


Diagram 5A.

Refer to Diagram 5A

- 5.1** To ensure alignment is maintained between the transfer crane and the transfer beam, a gooseneck support is recommended. Gooseneck supports allow the two mating beams to deflect equally with the transfer carrier weight from one beam to another.

STEP 6 - AUTOMATIC LATCH KIT INSTALLATION



| AUTOMATIC LATCH ASSEMBLY FOR L OR H INTERLOCK ON 10" AND LARGER TARCA BEAMS. 1-17981-006 | | | |
|---|-------------|-----------------------------|------|
| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
| 1 | 1-17981-000 | LATCH LEVER | 1 |
| 2 | 1-17992-000 | SPRING ANCHOR PIN | 2 |
| 3 | 1-17993-000 | LATCH PIN | 1 |
| 4 | T-28042-108 | COTTER PIN, 3/32" X 1" LONG | 2 |
| 5 | 1-17994-000 | LATCH SPRING | 1 |
| 6 | 1-17995-000 | LATCH BAR | 1 |
| 7 | T-28011-004 | 1/4"-20 HEX HEAD CAP SCREW | 2 |
| 8 | T-28003-204 | 1/4" LOCK WASHER | 2 |

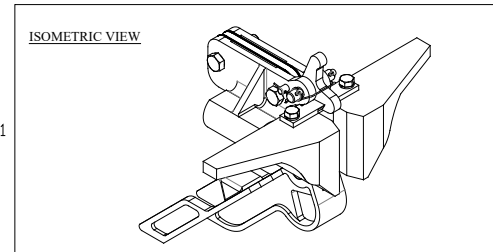
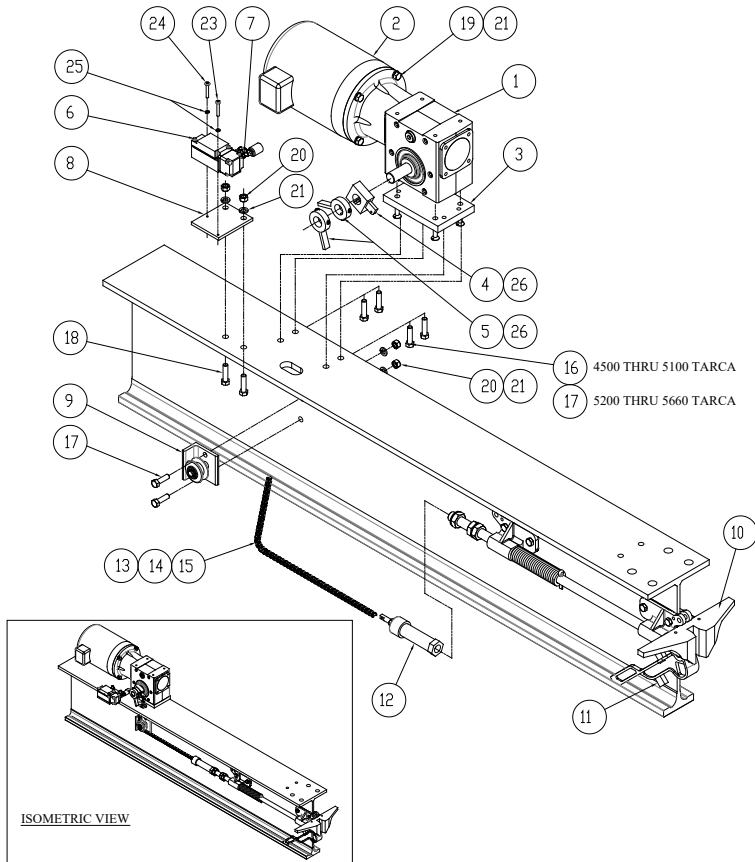


Diagram 6A.

Refer to Diagram 6A

- 6.1** When the interlock and discharge point are equipped with an automatic latch kit, the operator can pre-set the throwout mechanism. As the two rails come into alignment, the latch lever is released and the crane and spur are locked together.
- 6.2** In addition to the automatic latch components shown in **diagram 6A**, a tripper cam (items 11 and 12, **diagram 3C**, page 8) must be fitted into the LD discharge point. This tripper cam releases the pre-set interlock by striking the latch lever (item 1) and engages the mechanism. The tripper cam (item 11, **diagram 3C**, page 8) must be extended far enough to release the latch lever without interfering with the operation of the transfer crane along the runway.

STEP 7 - MOTOR OPERATOR INSTALLATION



| MOTOR DRIVEN TYPE L INTERLOCK ASSEMBLY P/N: 4K-17900-42 | | | |
|--|-------------|---|------|
| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
| 1 | SP057 | REDUCER, TEXTRON SIZE 04, 60:1 RATIO | 1 |
| 2 | 2K-35706-1 | MOTOR, 1/6 HP @ 600 SRPM, 230/460V-3PH-60HZ | 1 |
| 3 | 2K-17902-34 | BASE PLATE FOR REDUCER | 1 |
| 4 | 2K-17905-8 | ACTUATOR & CHAIN ATTACHMENT | 1 |
| 5 | 2K-17906-4 | LIMIT SWITCH TRIPPER | 2 |
| 6 | 0-78102-550 | LIMIT SWITCH, C/H # E50NN1 | 1 |
| 7 | 0-78103-167 | LEVER, C/H # E50KL355 | 1 |
| 8 | 2K-32039-11 | MOUNTING PLATE, LIMIT SWITCH | 1 |
| 9 | 1-17972-100 | SHEAVE & BRACKET ASSY. | 1 |
| 10 | 1-17948-106 | "L" INTERLOCK SUB-ASSY. | 1 |
| 11 | 1-17973-100 | SAFETY FORK STOP | 2 |
| 12 | 2K-17955-6 | SPRING LOADED CHAIN ATTACHMENT | 1 |
| 13 | 0-70860-000 | ROLLER CHAIN, 3/8" PITCH,#35 | - |
| 14 | 0-70860-100 | CONNECTING LINK, #35 CHAIN | 2 |
| 15 | 0-70860-150 | OFFSET CONN. LINK # 35 CHAIN | 1 |
| 16 | T-28011-208 | 3/8"-16 HHCS, 1" LONG | 4 |
| 17 | T-28011-210 | 3/8"-16 HHCS, 1 1/4" LONG | 6 |
| 18 | T-28011-212 | 3/8"-16 HHCS, 1 1/2" LONG | 4 |
| 19 | 0-75812-000 | 3/8"-16 HHCS, 7/8" LONG | 4 |
| 20 | T-28005-206 | 3/8"-16 HEX. NUT | 4 |
| 21 | T-28003-206 | 3/8" LOCK WASHER | 12 |
| 22 | SP061 | M8 FLAT HEAD MACHINE SCREW, 1" LONG | 4 |
| 23 | T-28023-510 | #10-24 RD. HD. MACH SCREW, 1 1/4" LONG | 1 |
| 24 | T-28023-506 | #10-24 RD. HD. MACH SCREW, 3/4" LONG | 1 |
| 25 | T-28003-110 | #10 LOCK WASHER | 2 |
| 26 | T-28029-304 | 5/16"-18 SOC. SET SCREW, 1/2" LONG | 5 |
| ** 27 | 1-17981-006 | AUTO-LATCH ASSEMBLY (NOT SHOWN) | X |

* CHAIN LENGTH FOR INTERLOCK USED ON 10' (4500) TARCA = 18 3/4 INCHES (50 PITCHES) LONG WITH MALE LINK EACH END. WHEN USING A LARGER TARCA ADD AN EVEN NUMBER OF 3/8 INCH PITCHES TO EQUAL THE INCREASE.

** AUTO-LATCH ASSEMBLY TO BE SUPPLIED ONLY IF SPECIFIED ON ORDER. (NOT TO BE USED ON DOUBLE GIRDER CRANES)

Diagram 7A.

Refer to Diagram 7A

7.1 When the interlock is equipped electrically with a motor operator in place of the LPC throwout, the interlock assembly can be actuated electronically instead of manually. An actuator motor and end of travel limit switches are provided. Motor controller is not provided. Factory controls can be provided by Gorbel. Contact the factory for control solutions if needed.

CRANE OPERATOR INSTRUCTIONS

Overhead Patented Track cranes generally handle materials over working areas where there are personnel. Therefore, it is important for the Crane Operator to be instructed in the use of the crane and to understand the severe consequences of careless operation. It is not intended that these suggestions take precedence over existing plant safety rules and regulations or OSHA regulations. However, a thorough study of the following information should provide a better understanding of safe operation and afford a greater margin of safety for people and machinery on the plant floor. It must be recognized that these are suggestions for the Crane Operator's use. It is the responsibility of the owner to make personnel aware of all federal, state and local rules and codes, and to make certain operators are properly trained.

Qualifications

Crane operation, to be safe and efficient, requires skill: the exercise of extreme care and good judgement, alertness and concentration, and rigid adherence to proven safety rules and practices as outlined in applicable and current ANSI and OSHA safety standards. In general practice, no person should be permitted to operate a crane:

- Who cannot speak the appropriate language or read and understand the printed instructions.
- Who is not of legal age to operate this type of equipment.
- Whose hearing or eyesight is impaired (unless suitably corrected with good depth perception).
- Who may be suffering from heart or other ailments which might interfere with the operator's safe performance.
- Unless the operator has carefully read and studied this operation manual.
- Unless the operator has been properly instructed.
- Unless the operator has demonstrated his instructions through practical operation.
- Unless the operator is familiar with hitching equipment and safe hitching equipment practices.

Handling the Trolley Motion

Before a load is handled, the hoist should be positioned directly over the load that is to be handled. When the slack is taken out of the slings, if the hoist is not directly over the load, bring it directly over the load before hoisting is continued. Failure to center the hoist over the load may cause the load to swing upon lifting. Always start the trolley motion slowly and reduce the trolley speed gradually.

Handling the Hoist Motion

Refer to the lifting (hoist) equipment's operating instructions.

GENERAL SUGGESTIONS

Know Your Crane

Crane operators should be familiar with the principal parts of a crane and have a thorough knowledge of crane control functions and movements. The crane operator should be required to know the location and proper operation of the main conductor disconnecting means for all power to the attachments on the crane.

Responsibility

Each crane operator should be held directly responsible for the safe operation of the crane. Whenever there is any doubt as to SAFETY, the crane operator should stop the crane and refuse to handle loads until: (1) safety has been assured or (2) the operator has been ordered to proceed by the supervisor, who then assumes all responsibility for the SAFETY of the lift.

Do not permit **ANYONE** to ride on the hook or a load.

Inspection

Test the crane movement and any attachments on the crane at the beginning of each shift. Whenever the operator finds anything wrong or apparently wrong, the problem should be reported immediately to the proper supervisor and appropriate corrective action taken.

Operating Suggestions

One measure of a good crane operator is the smoothness of the crane operation. The good crane operator should know and follow these proven suggestions for safe, efficient crane handling.

1. The crane should be moved smoothly and gradually to avoid abrupt, jerky movements of the load. Slack must be removed from the sling and hoisting ropes before the load is lifted.
2. Center the crane over the load before starting the hoist to avoid swinging the load as the lift is started. Loads should not be swung by the crane to reach areas not under the crane.
3. Crane-hoisting ropes should be kept vertical. Cranes shall not be used for side pulls.
4. Be sure everyone in the immediate area is clear of the load and aware that a load is being moved.
5. Do not make lifts beyond the rated load capacity of the crane, sling chains, rope slings, etc.
6. Make certain that before moving the load, load slings, load chains, or other lifting devices are fully seated in the saddle of the hook with hook latch closed (if equipped with hook latch).
7. Check to be sure that the load and/or bottom block is lifted high enough to clear all obstructions when moving boom or trolley.
8. At no time should a load be left suspended from the crane unless the operator has the push button with the power on, and under this condition keep the load as close as possible to the floor to minimize the possibility of an injury if the load should drop. When the crane is holding a load, the crane operator should remain at the push button.
9. Do not lift loads with sling hooks hanging loose. If all sling hooks are not needed, they should be properly stored, or use a different sling.
10. All slings or cables should be removed from the crane hooks when not in use (dangling cables or hooks hung in sling rings can inadvertently snag other objects when the crane is moving).
11. Operators shall not carry loads and/or empty bottom blocks over personnel. Particular additional caution should be practiced when using magnet or vacuum devices. Loads, or parts of loads, held magnetically could drop. Failure of power to magnets or vacuum devices can result in dropping the load. Extra precaution should be exercised when handling molten metal in the proximity of personnel.
12. Whenever the operator leaves the crane the following procedure should be followed:
 - Raise all hooks to an intermediate position.
 - Spot the crane at an approved designated location.
 - Place all controls in the "off" position.
 - Open the main switch to the "off" position.
 - Make visual check before leaving the crane.
13. In case of emergency or during inspection, repairing, cleaning or lubrication, a warning sign or signal should be displayed and the main switch should be locked in the "off" position. This should be done whether the work is being done by the crane operator or by others.
14. Contact with rotation stops or trolley end stops shall be made with extreme caution. The operator should do so with particular care for the safety of persons below the crane, and only after making certain that any persons on the other cranes are aware of what is being done.
15. ANY SAFETY FEATURES AND MECHANISMS BUILT IN OR OTHERWISE PROVIDED WITH THE CRANE BY CLEVELAND TRAMRAIL ARE REQUIRED FOR THE SAFE OPERATION OF THE CRANE. DO NOT, UNDER ANY CIRCUMSTANCES, REMOVE OR OTHERWISE IMPAIR OR DISABLE THE PROPER FUNCTIONING OF ANY CRANE SAFETY MECHANISMS OR FEATURES BUILT-IN OR OTHERWISE PROVIDED BY CLEVELAND TRAMRAIL FOR SAFE OPERATION OF THE CRANE. ANY REMOVAL, IMPAIRMENT OR DISABLING OF ANY SUCH SAFETY MECHANISMS OR FEATURES OR OTHER USE OR OPERATION OF THE CRANE WITHOUT THE COMPLETE AND PROPER FUNCTIONING OF ANY SUCH SAFETY MECHANISMS OR FEATURES AUTOMATICALLY AND IMMEDIATELY VOIDS ANY AND ALL EXPRESS AND IMPLIED WARRANTIES OF ANY KIND OR NATURE.

LIMITED WARRANTY

It is agreed that the equipment purchased hereunder is subject to the following LIMITED warranty and no other. Gorbel warrants the manual or motorized Patented Track Crane products to be free from defects in material or workmanship for a period of two years or 4,000 hours use from date of shipment in class C service. This warranty shall not cover failure or defective operation caused by operation in excess of recommended capacities, misuses, negligence or accident, and alteration or repair not authorized by Gorbel. No system shall be modified after manufacture without the written authorization of Cleveland Tramrail Inc. Any field modification without the written authorization of Gorbel Inc. shall void Gorbel's warranty obligation. This warranty shall not cover wearable parts, including but not limited to wheels, gears, pinions, bearings, motors, electrical controls, and crane electrification. OTHER THAN AS SET FORTH HEREIN, NO OTHER EXPRESS WARRANTIES, AND NO IMPLIED WARRANTIES, ORAL OR WRITTEN, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE BY GORBEL WITH RESPECT TO ITS PRODUCTS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED. GORBEL SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY INCIDENTAL, SPECIAL, AND/OR CONSEQUENTIAL DAMAGES WHATSOEVER, WHETHER OR NOT FORESEEABLE, INCLUDING BUT NOT LIMITED TO DAMAGES FOR LOST PROFITS AND ALL SUCH INCIDENTAL, SPECIAL, AND/OR CONSEQUENTIAL DAMAGES ARE HEREBY ALSO SPECIFICALLY DISCLAIMED. Gorbel's obligation and Purchaser's or end user's sole remedy under this warranty is limited to the replacement or repair of Gorbel's products at the factory, or at the discretion of Gorbel, at a location designated by Gorbel. Purchaser or end user shall be solely responsible for all freight and transportation costs incurred in connection with any warranty work provided by Gorbel hereunder. Gorbel will not be liable for any loss, injury or damage to persons or property, nor for damages of any kind resulting from failure or defective operation of any materials or equipment furnished hereunder. Components and accessories not manufactured by Gorbel are not included in this warranty. Purchaser's or end user's remedy for components and accessories not manufactured by Gorbel is limited to and determined by the terms and conditions of the warranty provided by the respective manufacturers of such components and accessories.

A) DISCLAIMER OF IMPLIED WARRANTY OF MERCHANTABILITY

Gorbel and Purchaser agree that the implied warranty of merchantability is excluded from this transaction and shall not apply to the goods involved in this transaction.

B) DISCLAIMER OF IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE

Gorbel and Purchaser agree that the implied warranty of fitness for particular purpose is excluded from this transaction and shall not apply to the goods involved in this transaction.

C) DISCLAIMER OF EXPRESS WARRANTY

Gorbel's agents, or dealer's agents, or distributor's agents may have made oral statements about the machinery and equipment described in this transaction. Such statements do not constitute warranties, and Purchaser agrees not to rely on such statements. Purchaser also agrees that such statements are not part of this transaction.

D) DISCLAIMER OF SPECIAL, INCIDENTAL AND CONSEQUENTIAL DAMAGES

Gorbel and Purchaser agree that any claim made by Purchaser which is inconsistent with Gorbel's obligations and the warranty remedies provided with Gorbel's products, and in particular, special, incidental and consequential damages, are expressly excluded.

E) DEALER OR DISTRIBUTOR NOT AN AGENT

Gorbel and Purchaser agree that Purchaser has been put on notice that dealer or distributor is not Gorbel's agent in any respect for any reason. Gorbel and Purchaser also agree that Purchaser has been put on notice that dealer or distributor is not authorized to incur any obligations or to make any representations or warranties on Gorbel's behalf other than those specifically set forth in Gorbel's warranty provided in connection with its product.

F) MERGER

This warranty agreement constitutes a final and complete written expression of all the terms and conditions of this warranty and is a complete and exclusive statement of those terms.

G) PAINTING

Every crane (excluding components) receives a quality paint job before leaving the factory. Unfortunately, no paint will protect against the abuses received during the transportation process via common carrier. We have included at least one (1) twelve ounce spray can for touchup with each crane ordered (unless special paint was specified). If additional paint is required, contact a Gorbel® Inside Sales Representative at 1-800-821-0086 or 1-585-924-6262.

Title and Ownership:

Title to the machinery and equipment described in the foregoing proposal shall remain with Gorbel and shall not pass to the Purchaser until the full amount herein agreed to be paid has been fully paid in cash.

Claims and Damages:

Unless expressly stated in writing, goods and equipment shall be at Purchaser's risk on and after Seller's delivery in good shipping order to the Carrier. Gorbel shall in no event be held responsible for materials furnished or work performed by any person other than it or its authorized representative or agent.

Cancellations:

If it becomes necessary for the Purchaser to cancel this order wholly or in part, he shall at once so advise Gorbel in writing. Upon receipt of such written notice all work will stop immediately. If the order entails only stock items, a flat restocking charge of 15% of the purchase price will become due and payable by Purchaser to Gorbel. Items purchased specifically for the canceled order shall be charged for in accordance with the cancellation charges of our supplier plus 15% for handling in our factory. The cost of material and/or labor expended in general fabrication for the order shall be charged for on the basis of total costs to Gorbel up to the time of cancellation plus 15%.

Returns:

No equipment, materials or parts may be returned to Gorbel without express permission in writing to do so.

Extra Charge Delay: If Purchaser delays or interrupts progress of Seller's performance, or causes changes to be made, Purchaser agrees to reimburse Gorbel for expense, if any, incident to such delay.

Changes and Alterations:

Gorbel reserves the right to make changes in the details of construction of the equipment, as in its judgement, will be in the interest of the Purchaser; will make any changes in or additions to the equipment which may be agreed upon in writing by the Purchaser; and Gorbel is not obligated to make such changes in products previously sold any customer.

Third Party Action:

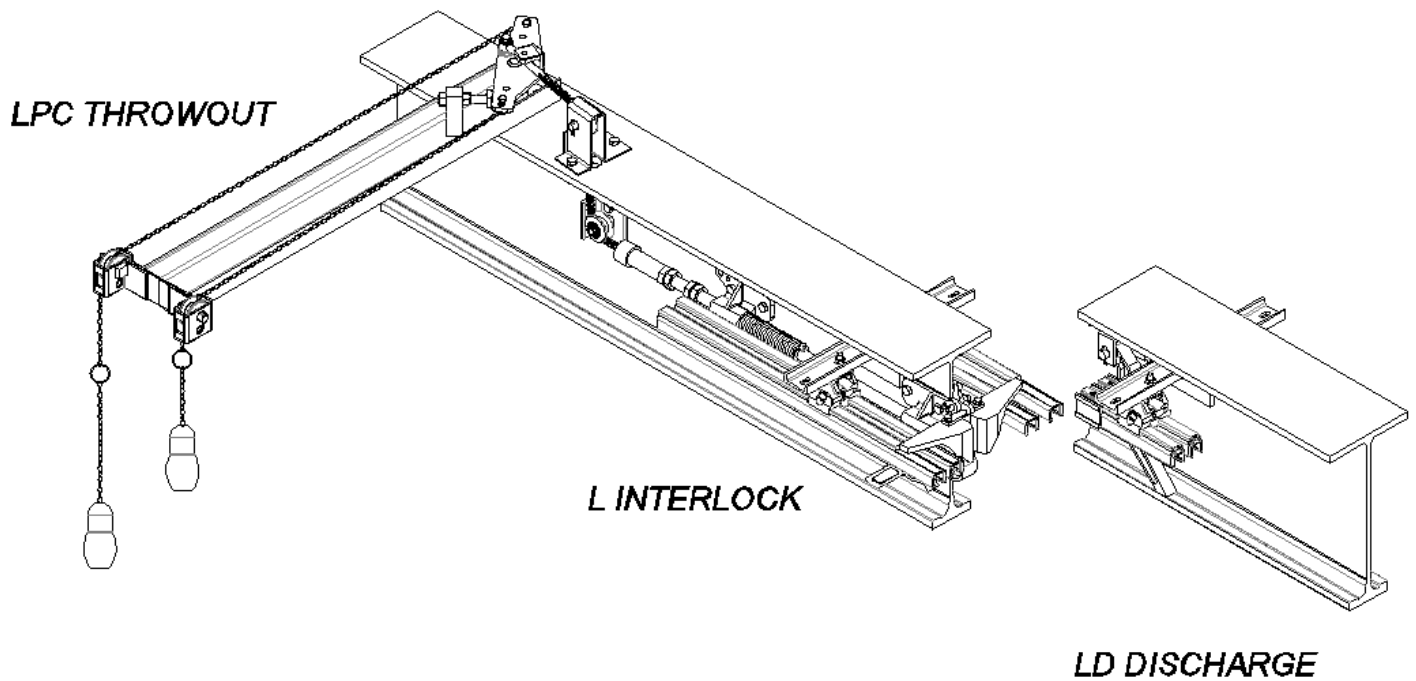
Should Gorbel have to resort to third party action to collect any amount due after thirty (30) days from the date of invoice, the Purchaser agrees to pay collection costs, reasonable attorney's fees, court costs and legal interest.

OSHA Responsibilities:

Gorbel agrees to fully cooperate with Purchaser in the design, manufacture or procurement of safety features or devices that comply with OSHA regulations. In the event additional equipment or labor shall be furnished by Gorbel, it will be at prices and standard rates then in effect, or as may be mutually agreed upon at the time of the additional installation.

Equal Employment Opportunity:

Gorbel agrees to take affirmative action to ensure equal employment opportunity for all job applicants and employees without regard to race, color, age, religion, sex, national origin, handicap, veteran, or marital status. Gorbel agrees to maintain non-segregated work facilities and comply to rules and regulations of the Secretary of Labor or as otherwise provided by law or Executive Order.



! WARNING

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