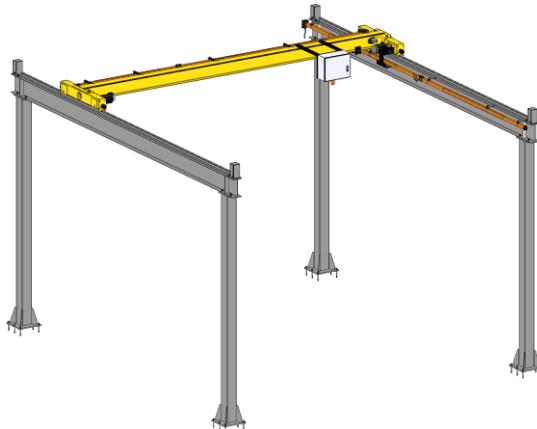




Installation, Operation, & Maintenance Manual



General Installation Safety	2
Pre-Installation Checklist	3
System Capacity information	4
Pre-assembly & Column Installation	5
Runway Installation	9
Crane Rail Installation	10
Runway End Stop	14
Runway Electrification	17
Final Steps	25
Sway Brace Installation (Optional)	26
Torque Specifications	27
Crane Operator Instructions	28
Schematics	31
Warranty	36
Periodic Inspection & Lubrication	38

Date purchased _____

SN _____

Order Number _____

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Freestanding Top Running Motorized Bridge Crane



Before you begin. Read the instructions carefully, from beginning to end, and follow the proper sequence.

Thank you for purchasing a PWI crane! We have been building overhead cranes for years and our experience and knowledge should give you peace of mind. We too use overhead cranes in our manufacturing processes. From design & engineering, all the way to installation of our crane systems, our experience and passion for quality crane systems is shown in our products. We hope you find the installation ease and use of our PWI products to be among the best items you have purchased.

Thank you from the entire staff at PWI.

General Safety:

- Safety comes first when unloading and assembling your crane system. Many of the components are heavy and require lifting equipment to move and set them in place. Make sure the equipment you choose to support and lift each piece is capable of the task with extra capacity to do the job. Do not end up in a dangerous situation.
- Start with checking any lifting fixtures/tools for damage or wear that could lead to severe injury or death.
- This manual assumes that you have performed any foundation analysis ahead of placing your crane system in the proper location. Failure to provide the proper footing depth and width based on your column loads can result in failure of the floor structure supporting your crane.
- Please call PWI if you are unsure of the slab/foundation requirements for your crane system.



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Freestanding Top Running Motorized Bridge Crane

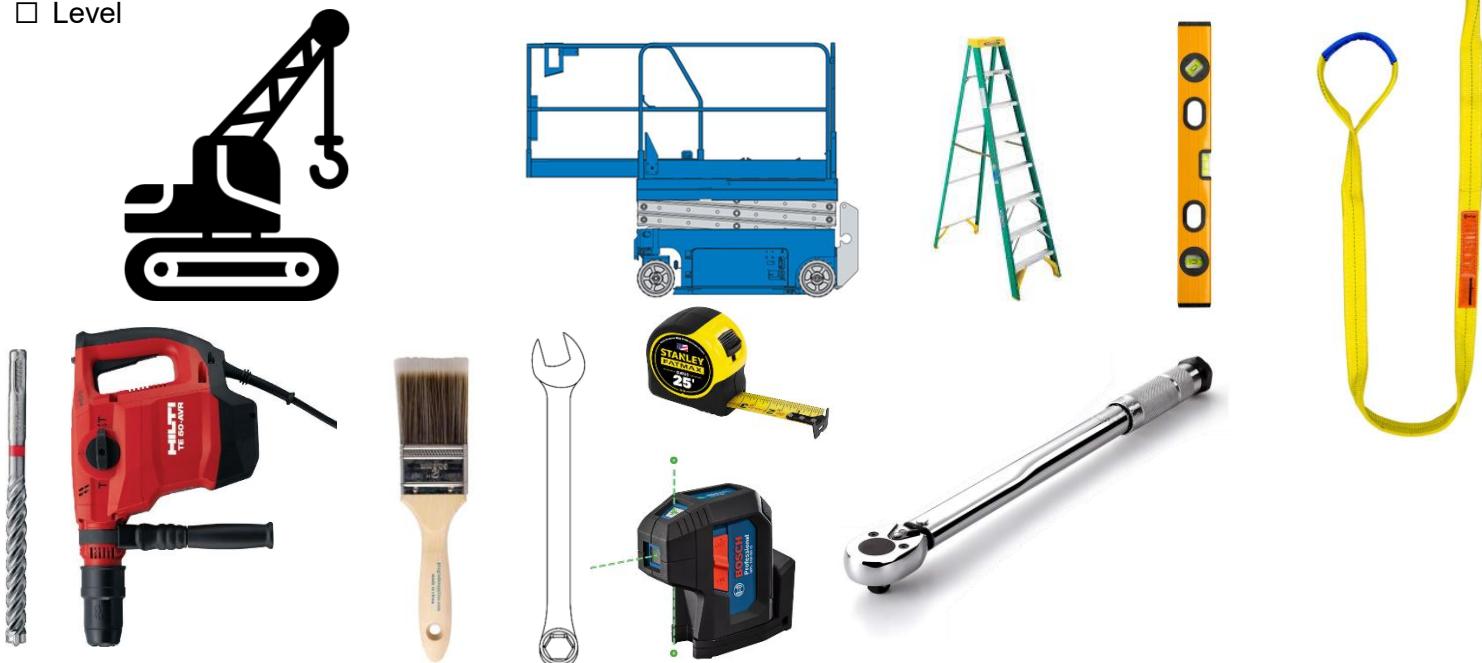


Pre-Installation Checklist:

- Check your shipment for the correct components and hardware. Your shipment should include shipping sheets that were checked off by our team
- Check your shipment for drawings for layout and installation of components
- Clear the area as much as possible of items that could be damaged or create hazards during the installation. When assembling near electrical panels be aware of any regulations regarding perimeters required around those objects
- Forklift or suitable lifting equipment
- Should you have any technical questions, or feel you have defective components or missing items, call us immediately. We will be glad to assist you.

Tools Needed:

<input type="checkbox"/> Proper PPE	<input type="checkbox"/> Hammer
<input type="checkbox"/> Lifting Device	<input type="checkbox"/> Torque Wrench
<input type="checkbox"/> Ladder/Man Lift	<input type="checkbox"/> Wrench Set
<input type="checkbox"/> Nylon Lifting Sling	<input type="checkbox"/> Laser Level
<input type="checkbox"/> Marker	<input type="checkbox"/> Paint Brush
<input type="checkbox"/> Tape Measure	<input type="checkbox"/> Hammer Drill
<input type="checkbox"/> Chalk Line	<input type="checkbox"/> Hammer Drill Bits
<input type="checkbox"/> Level	



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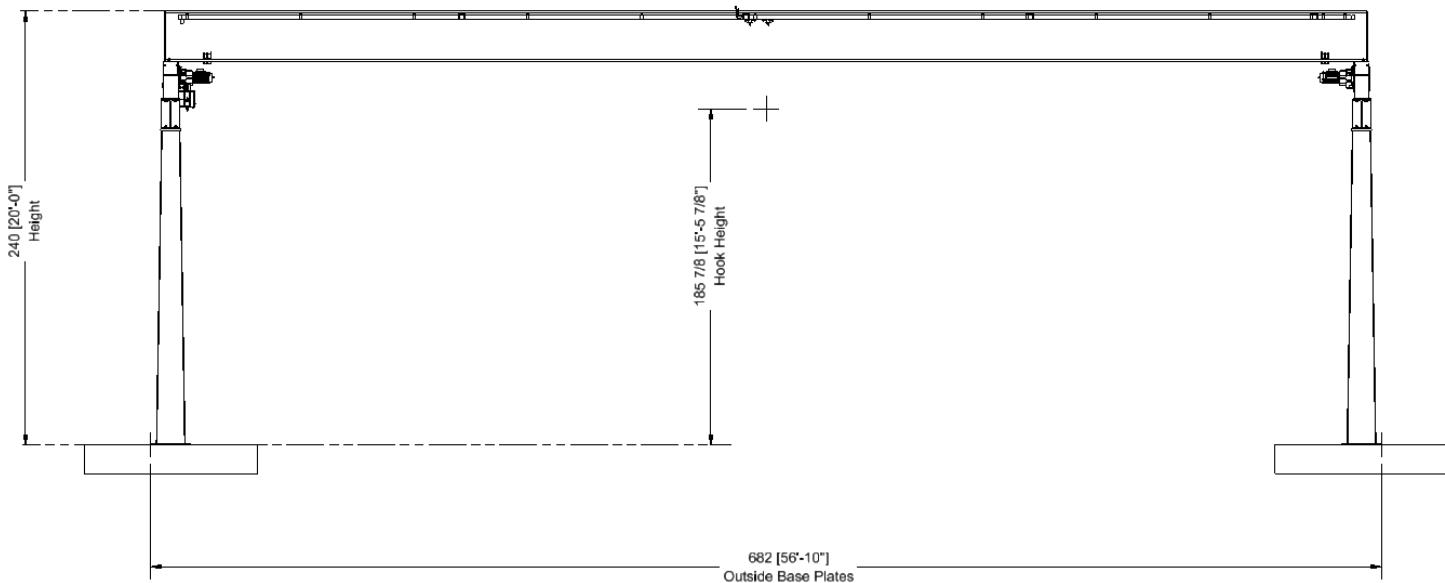
Freestanding Top Running Motorized Bridge Crane



System Capacity Information:

The innovative design and heavy-duty construction of the PWI motorized top-runner system will provide a superior quality product that will offer years of long-term value. The hoist weight allowance is 15% of the cranes capacity (for example, a crane rated for 6000 pounds allows for a 6000-pound live load plus 900 pounds for the weight of the hoist). There is also an allowance of 15% of the crane capacity for impact caused by hoist use. PWI motorized top-running systems will provide many years of dependable service by following the installation and maintenance procedures described herein.

Note: Any dimensions shown in this manual are for illustration purposes only. Refer to the drawings that were sent with your system for the exact measurements and configuration of the system we built for you.



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Freestanding Top Running Motorized Bridge Crane

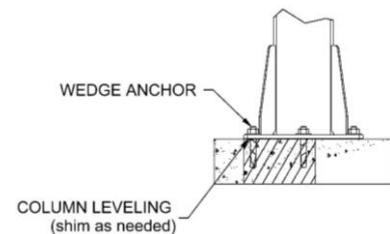


Pre-Assembly

1. If your floor surface is uneven Grout under the column base plates will be required to provide an even foundation to build on. Leveling nuts under the column base plate is an acceptable method that will aid leveling your system. (Shimming and Leveling nuts and Epoxy Anchors are not supplied with your system). If you must use grout under your columns to get a level system, use epoxy anchor bolts (not included) recommended. Epoxy anchors need to withstand 4880# of pull force. Contact PWI if you have questions.

Column Installation

2. Using the drawings supplied with your system verify that the area you are placing the crane system in will not encounter unforeseen obstructions. **Mark on the floor the center point of each column.** Look for obstructions that would require moving the system to avoid interference. CMAA and the Occupational Safety and Health Administration (OSHA) require all moving objects, such as cranes and hoists, to remain clear of all stationary objects, such as building structures. OSHA suggests avoiding interference by installing cranes and hoists to clear all horizontal stationary objects by 2 inches and all vertical objects, such as roof trusses, lights, or pipes, by 3 inches. for clearances from door openings and electrical panels, please consult your local building inspector.
3. Once you have confirmed that the placement of your crane is free of obstructions and is within code compliance by marking the column centers, check that your marks are "square" by measuring diagonally from column center to column center. Once your system layout is correct and square you can **measure out from the center mark that you have made and sketch on the floor the outline of the column base plates.**
4. Stand the column up with a suitable lifting device and have help available to hold the column in place while drilling (2) of the anchor holes for now. **Verify that the parts at the top of the column will match the holes of your runway beam.** Drill the (2) holes (check your paperwork supplied for hole sizes, depth, and hardware torque specs) diagonally across from each other to temporarily anchor the columns. Shim the column as needed and us a level to make sure the column is plumb.



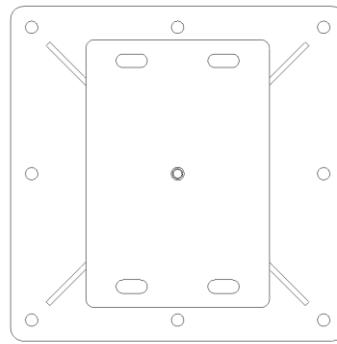
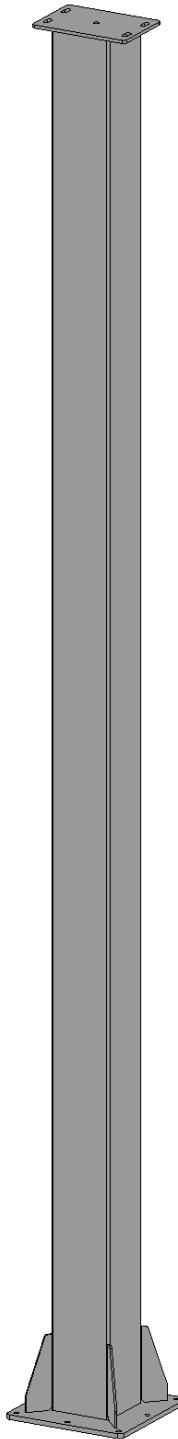
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Freestanding Top Running Motorized Bridge Crane



5. Confirm concrete slab is free from cracks or joints as depicted below.
6. Soil Pressure assumed at 2,500psf.
7. Confirm continuous concrete slab is reinforced and is 6" thick, 3,000 psi.



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Freestanding Top Running Motorized Bridge Crane



8. Install expansion anchors (refer to enclosed Installation Drawing Set for recommended dimensions and runway location).

INSTALLATION STEPS



1. Select a carbide drill bit with a diameter equal to the anchor diameter. Drill hole to any depth exceeding the desired embedment. See chart for minimum recommended embedment.
2. Clean hole or continue drilling additional depth to accommodate drill fines.
3. Assemble washer and nut, leaving top of stud exposed through nut. Drive anchor through material to be fastened until washer is flush to surface of material.
4. Expand anchor by tightening nut 3-5 turns past the hand tight position, or to the specified torque requirement.

** ONLY FOR USE IN CONCRETE**



Reference your Installation Drawing Set for the values below:

ANCHOR DIAMETER (A):

ANCHOR LENGTH (B):

ANCHOR DRILL (C):

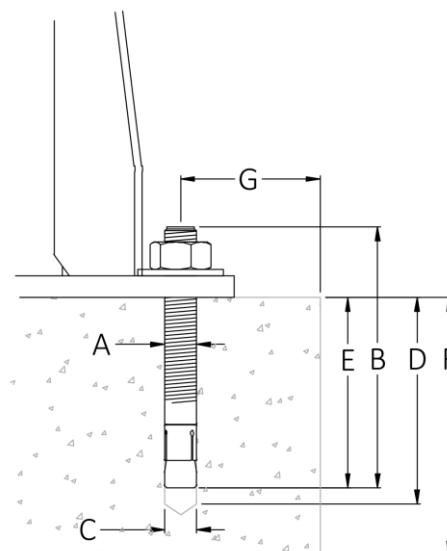
DRILL DEPTH (D):

ANCHOR EMBEDMENT (E):

CONCRETE THICKNESS (F):

MIN EDGE DISTANCE (G):

ANCHOR BOLT TORQUE:



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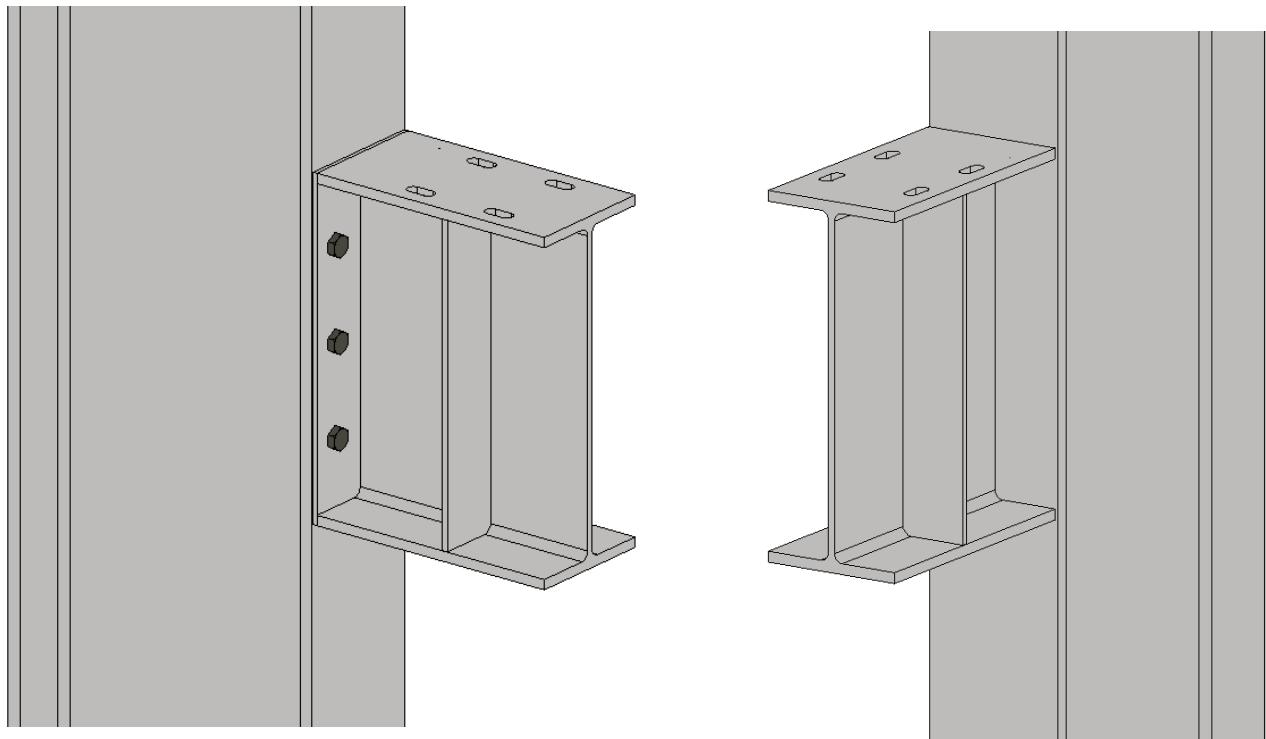


Freestanding Top Running Motorized Bridge Crane



Structure Mounted Preparations

9. If your system is mounting to the Building Structure communicate your Stool Capacity and Height requirement with your building contractor during design of your building.
10. For existing structures that have been evaluated for the installation of a structure-mounted system, the Contractor shall weld or bolt all runway stools to the existing building columns strictly in accordance with the requirements, details, and specifications provided by the Owner's licensed structural engineer. All work shall conform to applicable codes, standards, and engineered instructions, and no deviation shall be permitted without written approval from the structural engineer of record.



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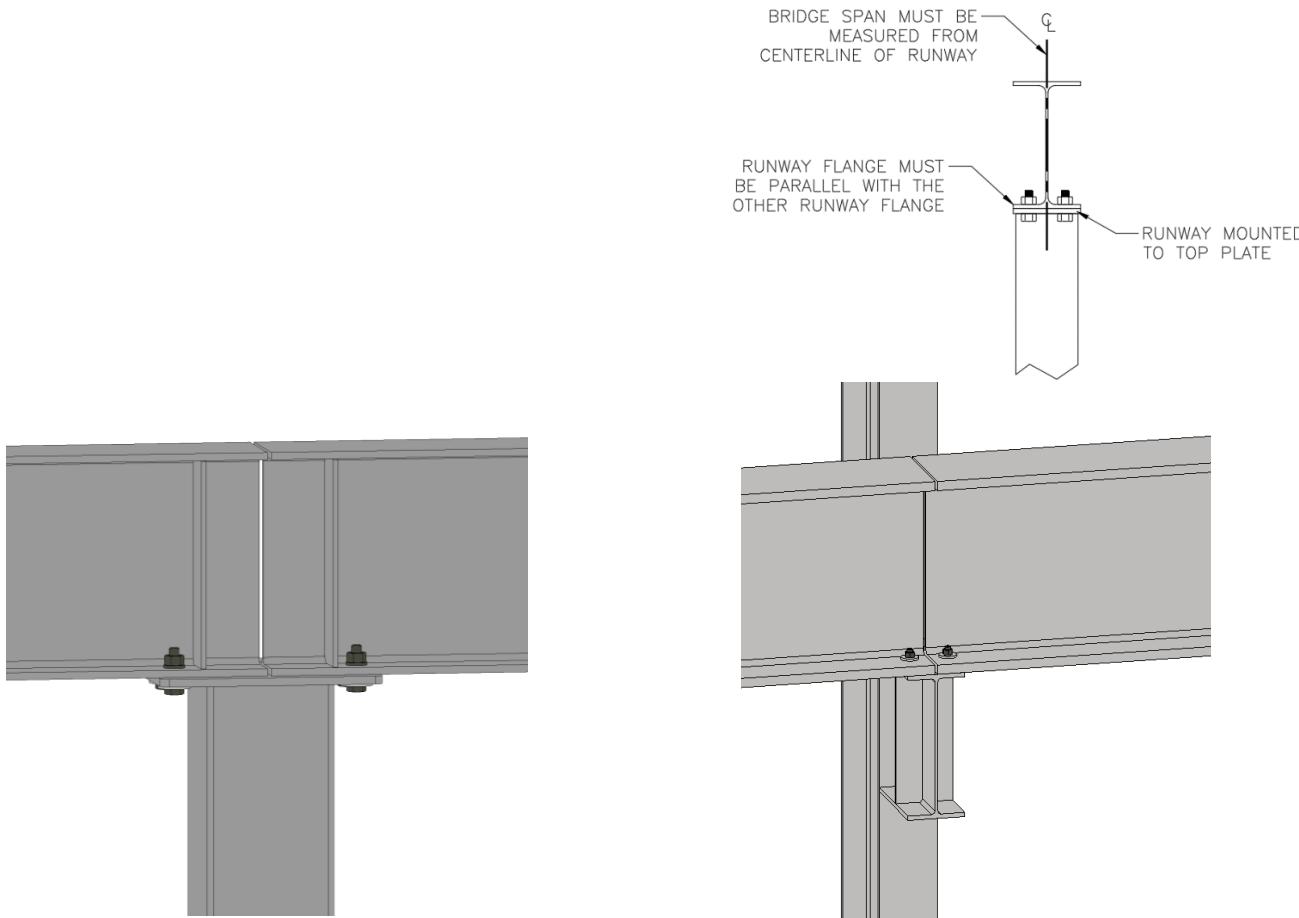


Freestanding Top Running Motorized Bridge Crane



Runway Installation

11. Lift runway section onto top plates of column weldment or building stool (refer to the enclosed Installation Drawing Set for recommended dimensions and runway location).
12. Using provided hardware (Structural Bolt, Structural Washer, Structural Nut, etc.), attach runway section to top plate as shown. For information on specific hardware to be used for any part of the crane system, refer to enclosed Installation Drawing Set. Tighten hardware to proper torque (refer to Page 20). After runways are installed, be sure to install the other anchors into all columns.



Note

Reference the Installation Drawing Set for splice locations. It will be necessary to install adjacent runways at the same time.

WARNING

There must be a minimum of two threads showing at the end of the bolt.

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Freestanding Top Running Motorized Bridge Crane



11. Crane Rail Installation



Crane Rail Installation Guide

PWI rail installation notes.

1. Maintain 1/2" gap from end of crane rail to beam end stop.
2. On both sides of the crane rail, weld rail clips 2' on center.
3. Use hammer to 'set' the crane rail splice bolts as you torque bolts
4. Crane rail splices should offset from runway beam splices.
5. Crane rail joints on opposite sides of the runway should be staggered.

CMAA 74

1.4.1.1 .1 Rails shall be straight, parallel, level, at the same elevation and at the specified center to center distance, within the tolerances given in Table 1.4.1-1.

1.4.1.1 .2 The runway rails should be standard rail sections, or other commercial rolled section with equivalent specifications and of a proper size for the crane to be installed.

1.4.1.1 .3 Crane rail splices shall be bolted or welded. Rail joints on opposite sides of the runway should be staggered. Properly selected hold-down devices shall be used to anchor the rail to the runway. Lateral "floating" type rail fastening is not recommended.

1.4.1.1.4 Rail joint misalignment can be a significant factor in wheel, axle, and bearing failures. It is recommended that horizontal rail separation at joints not exceed 1/16 inch. Vertical and horizontal alignment at joints should be maintained as closely as possible. Rail joints should be ground flush as necessary to provide a smooth transition from each rail segment to the next.

CMAA 70 1.41

1. Elevation of rails: $\pm 3/8"$ above or below an assumed reference elevation.
2. The maximum rate of elevation change: $1/8"$ in 20'-0".
3. Rail to rail elevation: $\pm 1/8"$ within the nominal average span length.
4. The maximum rate of change of rail to rail elevation: $1/8"$ in 20'-0"
5. Straightness of rail: $\pm 3/8"$ on either side of an assumed rail centerline
6. The maximum rate of change of rail straightness: $1/8"$ in 20'-0"
7. Variation in crane span: $\pm 1/8"$ difference relative to the nominal crane span
8. The maximum rate of change of variation in crane span: $1/8"$ in 20'-0"

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Freestanding Top Running Motorized Bridge Crane



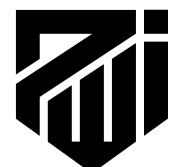
CMAA 74 Table 1.4.1-1

ITEM	FIGURE	OVERALL TOLERANCE	MAXIMUM RATE OF CHANGE
CRANE SPAN (L) MEASURED AT CRANE WHEEL CONTACT SURFACE		$L \leq 50'$ $A = \frac{3}{16}''$ $L > 50' \leq 100'$ $A = \frac{1}{4}''$ $L > 100'$ $A = \frac{3}{8}''$	$\frac{1}{4}''$ IN 20'-0"
STRAIGHTNESS (B)		$B = \frac{3}{8}''$	$\frac{1}{4}''$ IN 20'-0"
ELEVATION (C)		$C = \frac{3}{8}''$	$\frac{1}{4}''$ IN 20'-0"
TOP RUNNING TRANSVERSE RAIL TO RAIL ELEVATION (D)		$L \leq 50'$ $D = \pm \frac{3}{16}''$ $L > 50' \leq 100'$ $D = \pm \frac{1}{4}''$ $L > 100'$ $D = \pm \frac{3}{8}''$	N/A
TRANSVERSE GIRDERS TO GIRDERS ELEVATION UNDER RUNNING (D)			

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Freestanding Top Running Motorized Bridge Crane



TYPES OF SPLICES

Mechanical splices are used to connect one length of rail to the next. Generally, mechanical splices are more popular on smaller rail sizes, such as ASCE sections, or tee rails and **should only be used on lighter duty applications not high duty cycle production cranes**. Of those joints that are mechanically fastened, most use the **splice bar** type of plates without any toe, instead of partial or full toe plates.

The term "splice bar" actually refers to only one type of connector but frequently is confused with other types. The drawings shown in figure 1 provide clarification on the proper terminology for each type of connector bar. Angle bars are also sometimes referred to as "full-toe joint bars", and "joint bars" are sometimes called "short toe bars".

U.S. crane rail sizes 104#/yd. and

above usually have three drilled holes on the end of each rail and a six bolt splice bar pair. They are secured with six sets of bolt assemblies consisting of a bolt, a nut and a washer. ASCE and tee rails are generally joined with four bolt assemblies.

The drilling of rail ends and punching of splice plates follow generally accepted industry standard patterns for bolt assembly size, hole size and spacing which can be found in the AISC Manual of Steel Construction.

The standard drilling for tee rails and corresponding punching for splice bars provide for a 1/16" to 1/8" gap between rail ends. Although this construction is satisfactory for railroad track and light crane service, its use in general crane service may lead to joint batter. For best service in bolted splices **it is recommended that "tight fit joints" be stipulated** for all rails prepared for crane service.

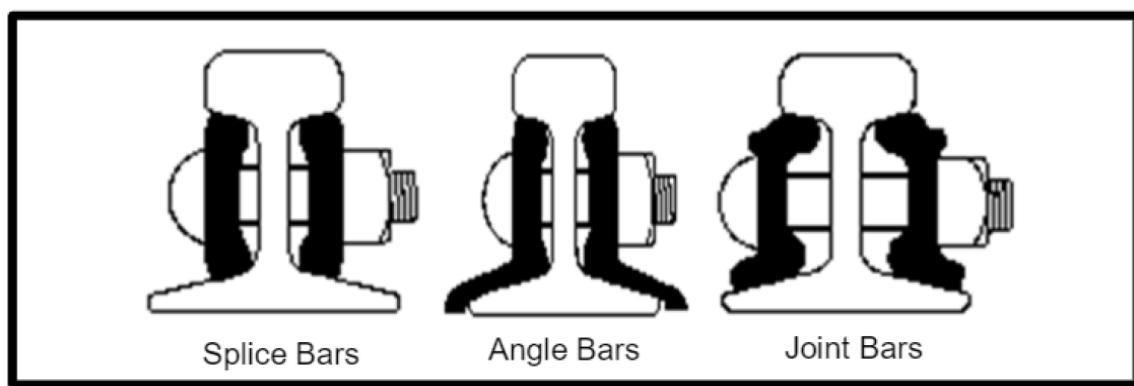
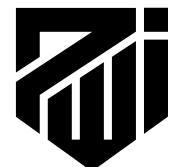


Figure 1

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Freestanding Top Running Motorized Bridge Crane



SPLICE JOINT BOLT ASSEMBLIES

There is no specific torque requirement for rail splice bolts but standard practice would dictate the bolts be torqued to a proof load of 70% of the bolt tensile strength.

Note as shown in figure 2 that the rail splice bolts should be inserted from alternating sides of the splice to aid in equal distribution of the tightening forces.



Figure 2

Proper splice joints are designed to wedge between the angled underside of the railhead and the angled top of the rail flange as shown in figure 3. The splice joint **should not bear against the web of the rail and a drilled flat bar is not an acceptable alternative.**

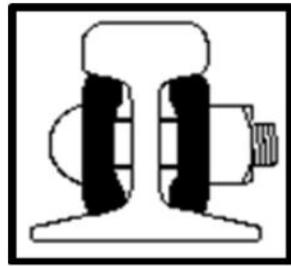


Figure 3

The mating angle between the rail and

splice bar is either 12 or 13 degrees depending on the rail size. Both the rail and splice bar have relatively rough surfaces when new and the joints wear in as the runway system is operated. Because of the geometry and wear, bolt pretension load can be lost very quickly. This condition can be aggravated when the rail is mounted on a crane rail pad or the rail joint falls between discontinuous support pedestals. Because of this ASTM A325 or ASTM A490 grade bolts should be specified and **splice bolts should be retightened after 30 days of use and checked every three months thereafter.** On discontinuous supported systems special sole plates should be positioned to support the rail joint whenever feasible.



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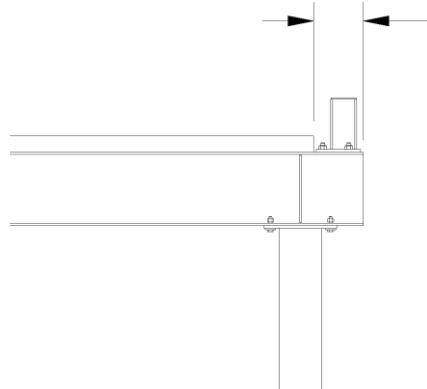


Freestanding Top Running Motorized Bridge Crane

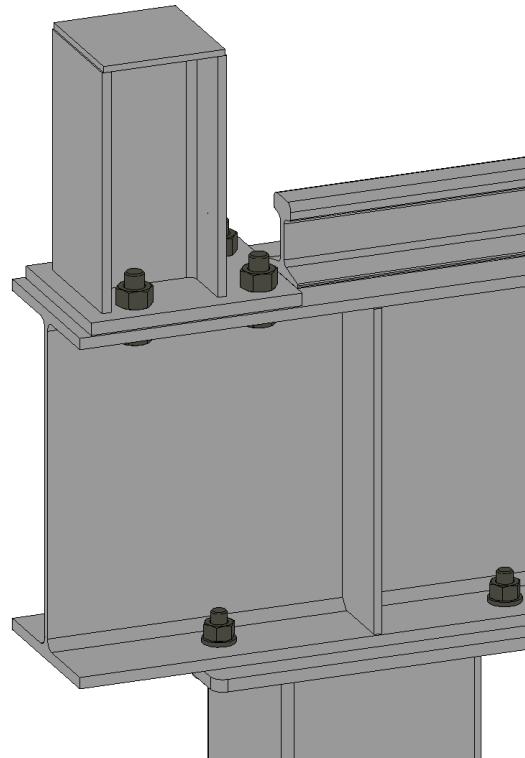
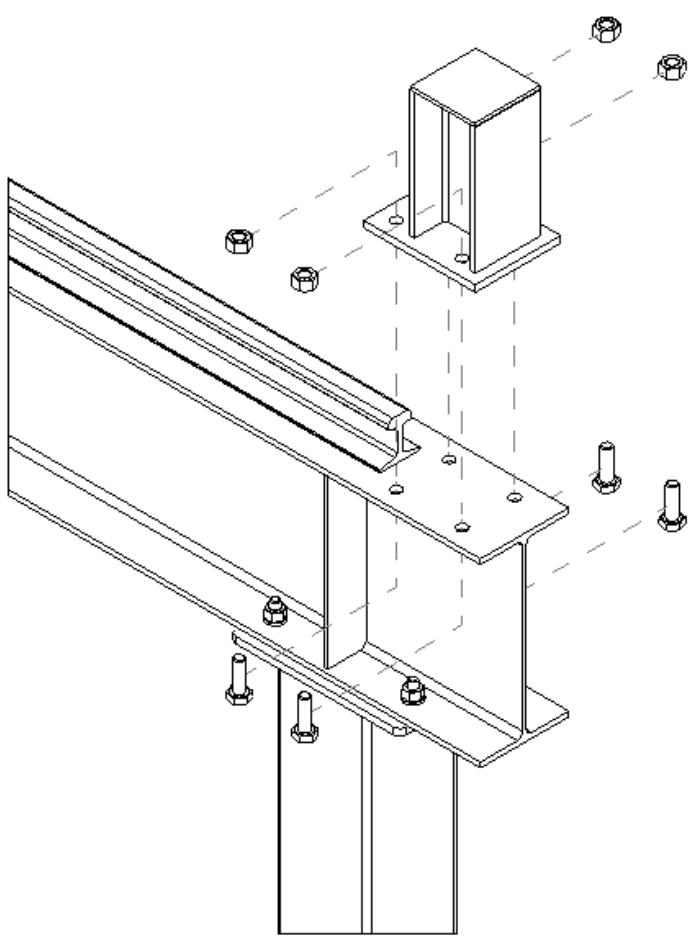


Step 5. End Stop Installation

End stops are required and must be installed at the end of runways. Ensure you leave adequate room for mounting your end stops at the beginning of and end of the runways.



1. Using hardware provided, attach end stop to top of runway, as shown.
2. Tighten hardware to proper torque (refer to Page 19).



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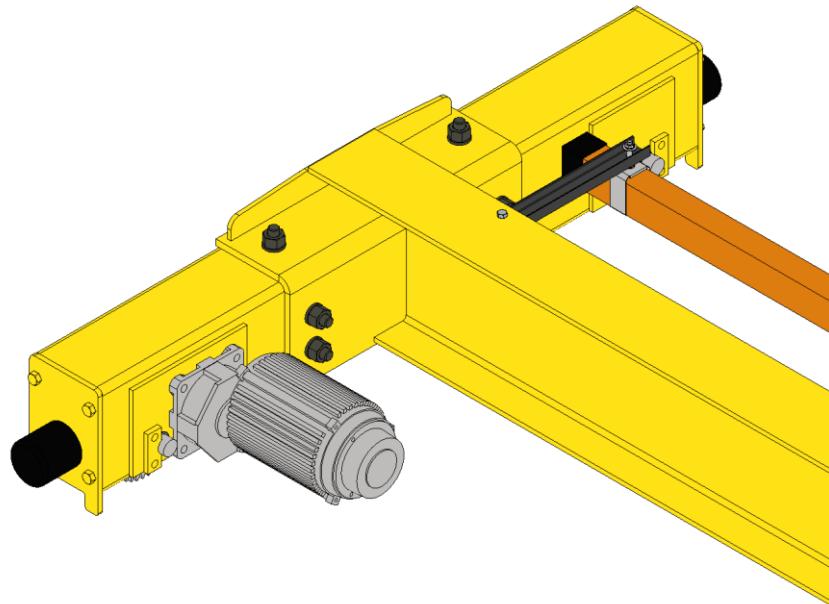
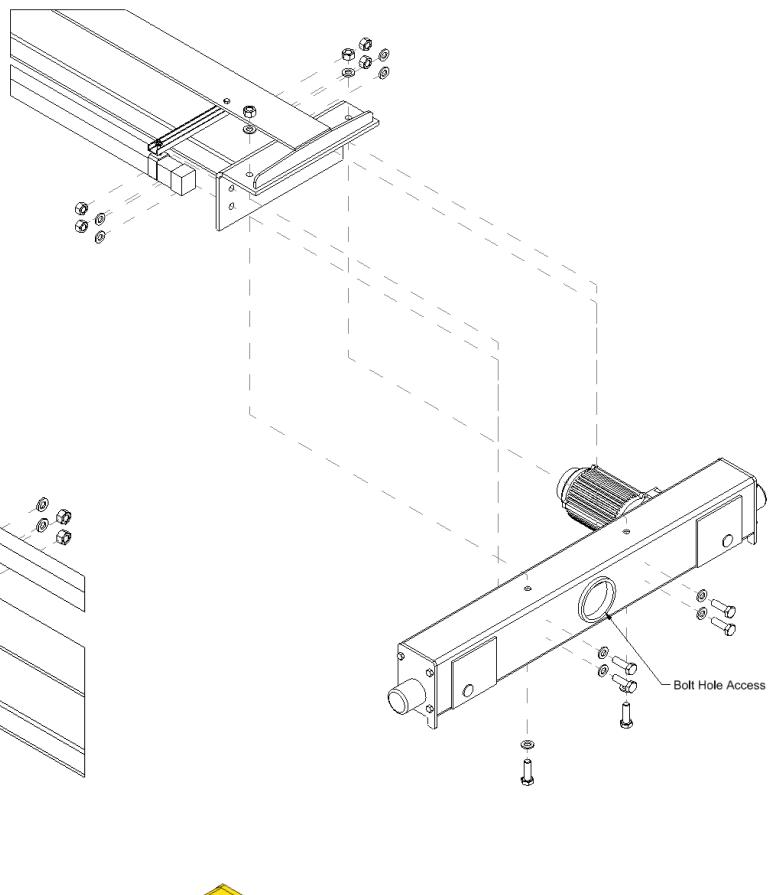


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Step 6. End Truck Installation

If end trucks are unattached, bolt each end truck on its correct side using the hardware provided as shown.



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Step 7. Installing Runway Electrification (Electrotrack)

1. If electrification brackets are not welded onto the runway beam (**Images 7.1A & 7.1C**), install the electrification brackets into the existing holes along the runway beam web. (**Image 7.1B**).

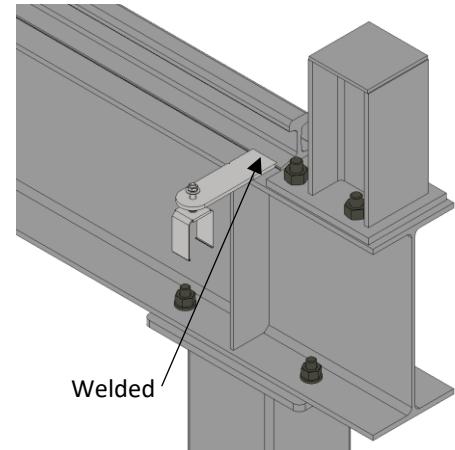


Image 7.1A Welded Brackets

Image 7.1B Runway Beam Web

2. Install one Starke Electrotrack hanger for each bracket. Keep fasteners loose. (**Image 7.2**).

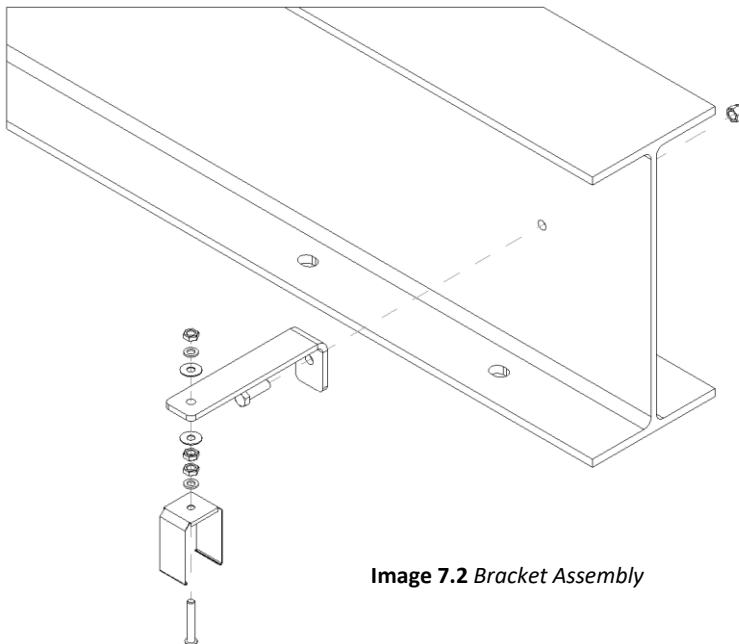


Image 7.2 Bracket Assembly

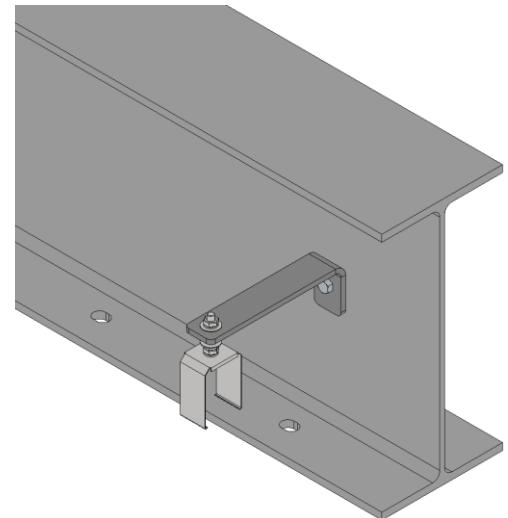


Image 7.1C Bolted Brackets

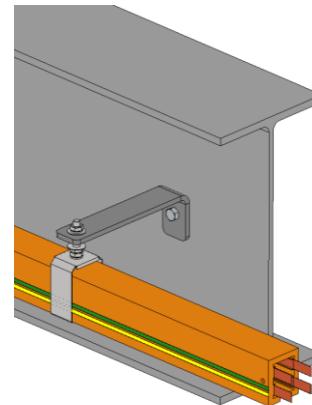
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Freestanding Top Running Motorized Bridge Crane



3. At the end of the system closest to building power supply install one full length Starke Electrottrack section to be used for "Incoming Power". (**Image 7.3**)



4. Drill a $\frac{1}{4}$ " hole in each copper conductor rail to connect incoming power. Just drill holes at this time for wires to connect to later. Then, insert the End Feature onto the end of the track. (**Image 7.4**)

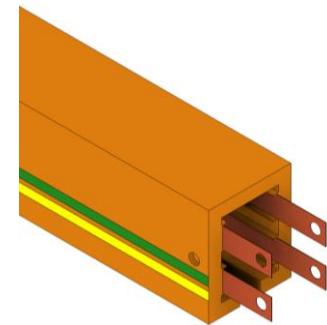


Image 7.3 Install Track

Image 7.4 $\frac{1}{4}$ " Drill Holes

5. Leaving a 4-6" gap install the second section, making sure the grounding conductors are oriented the same way. Note: each orange track is marked with a yellow and green line. This line indicates where the ground conductor is located. (**Image 7.5**)

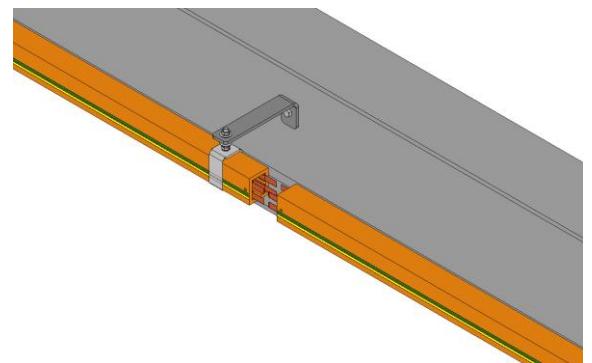


Image 7.5 Second Section

6. Press a conductor coupler onto the dimpled end of each of the 4 conductors as far as it will go. Note: coupler body goes to the outside of the conductor leaving a smooth transition on the inside face of each coupler. (**Image 7.6**)

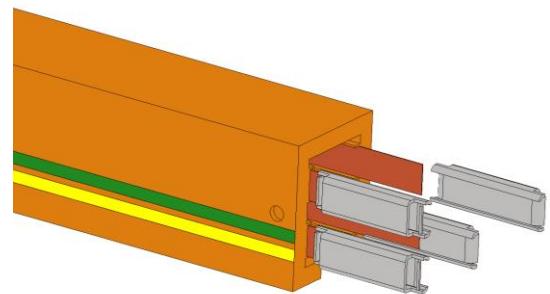


Image 7.6 Conductor Couplers

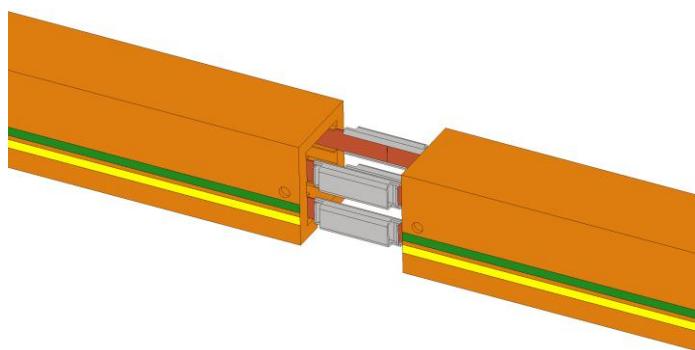


Image 7.7 Attach to Second Section

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Freestanding Top Running Motorized Bridge Crane



8. Place 1 half of a splice cover (**Image 7.8A**) around the conductor couplers and tight to the casing on both sides. 2 pins on the cover should align with 2 holes in the casing (**Image 7.8B**). Clip the other half of the splice cover into place locking rails together. Insert provided hardware into Splice Cover Holes (**Image 7.8C**).

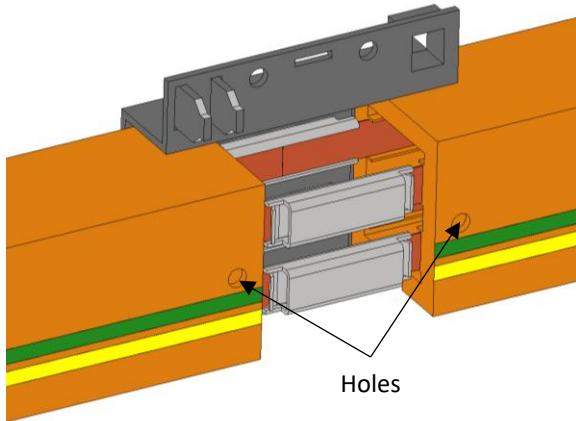


Image 7.8A Attach Splice Cover

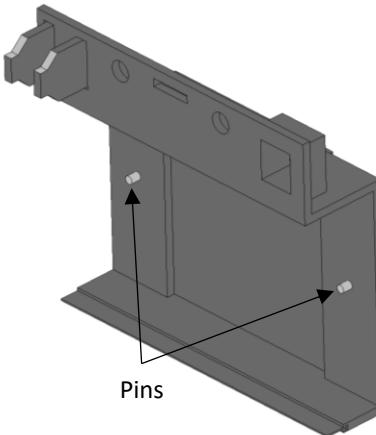


Image 7.8B Opposite Splice Cover

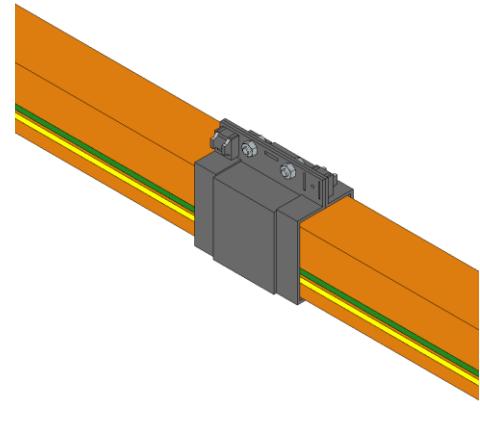


Image 7.8C Locked Splice Cover

9. Repeat **steps 7.5 - 7.8** as necessary until Electrotack is complete. (**Image 7.9**)

10. Once the Electrotack is complete, Place the power supply box on the “Incoming Power” end of the rail. (**Image 7.10**)

11. Insert a bolt through each conductor hole so that the bolt head is between the conductors (**Image 7.11**)

12. Place a terminal ring over the bolt on the outside of conductor followed with the locknut. (**Image 7.12**)

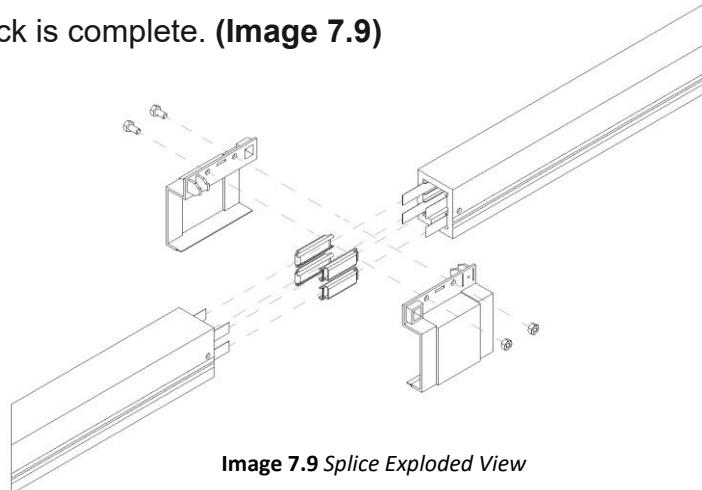


Image 7.9 Splice Exploded View

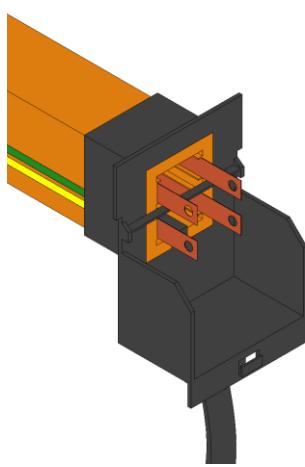


Image 7.10 Power Supply Box

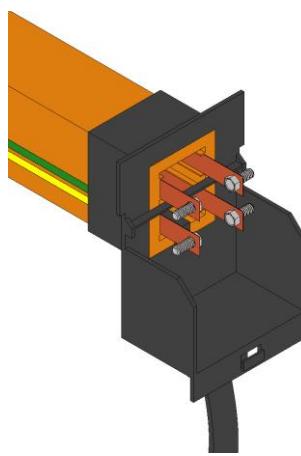


Image 7.11 Bolts Inserted

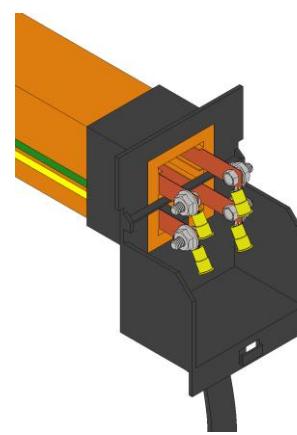


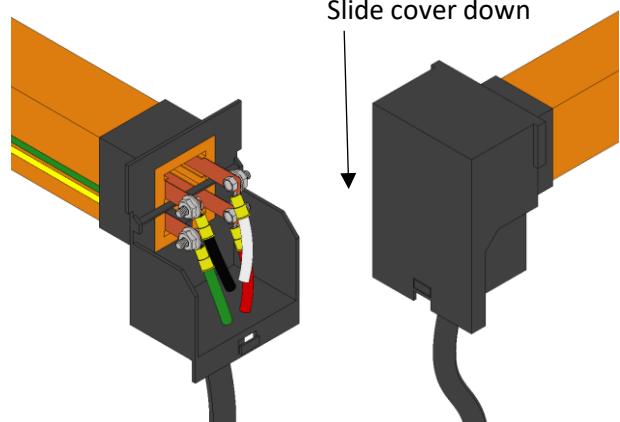
Image 7.12 Terminal Ring and Locknut

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Freestanding Top Running Motorized Bridge Crane



13. With the power disconnected and verified with voltage tester connect supply wire to conductors. Starting with grounding terminal (green/yellow stripe) attach green wire then proceed clockwise with black, white, then red (red opposite to ground) (**Image 7.13**)



14. Tighten the cord grip and tighten the connection nuts and bolts. Double check your assembly, then slide the power supply box cover in place and install the power supply cover. (**Images 7.14A & 7.14B**)

Image 7.13 Attached Wires Image 7.14A Supply Box Cover

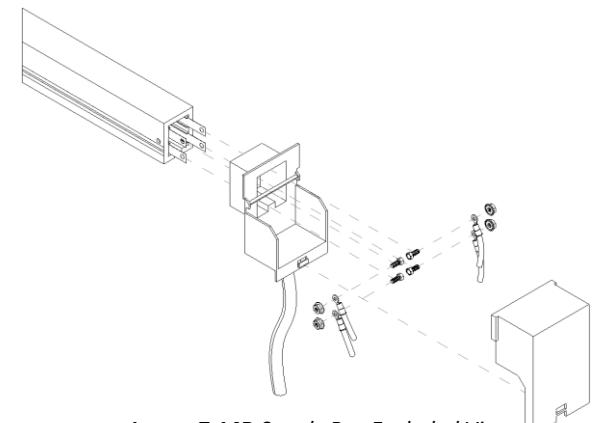


Image 7.14B Supply Box Exploded View

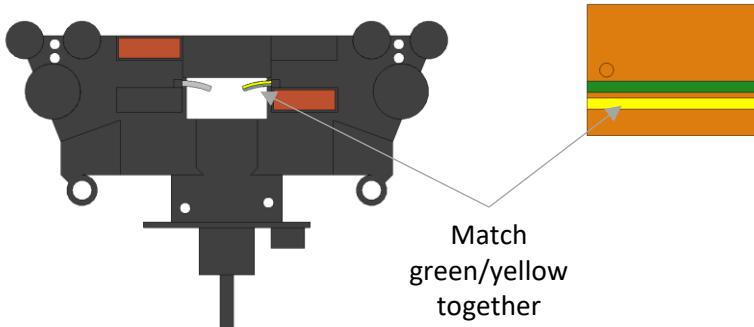


Image 7.15 Positioning Collector Trolley

16. Push the brushes in and slide the collector trolley into the Electrotrack. Depress the remaining brushes as you slide the trolley all the way in. (**Image 7.16**)

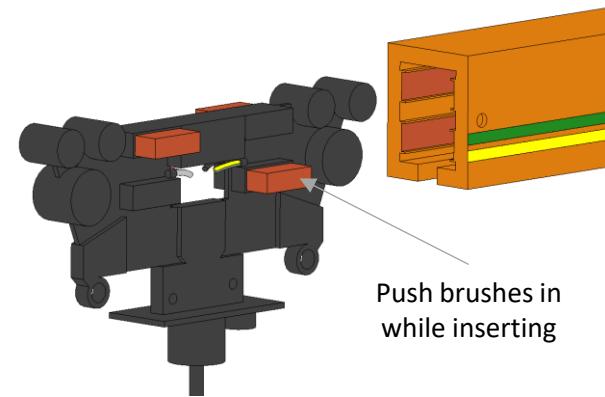


Image 7.16 Inserting Collector Trolley

17. Repeat steps **7.15 – 7.16** as needed for each Collector Trolley.

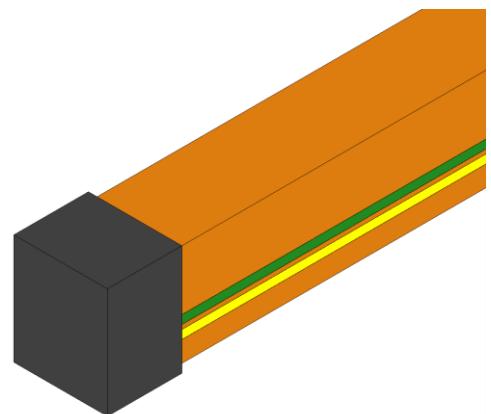
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Freestanding Top Running Motorized Bridge Crane



18. Once all Collector Trolley's are inserted, place an End Cap on the end of the Electrotrack. **(Image 7.18)**



19. Approximately insert the Tow Bar the guides the Collector through the Electrotrack, then align the Bridge and the Tow Bar. **(Images 7.19A, 7.19B)**

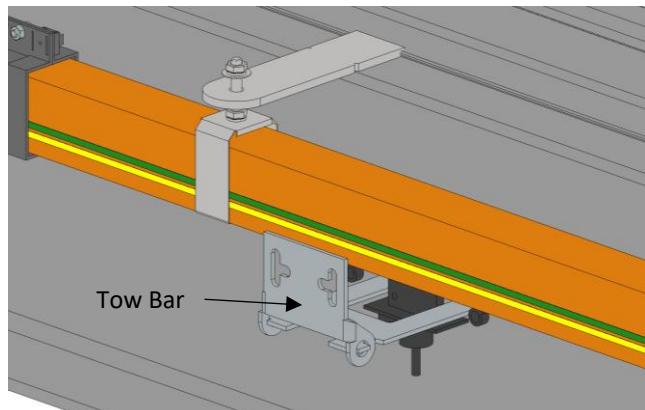


Image 7.19A Insert Tow Bar

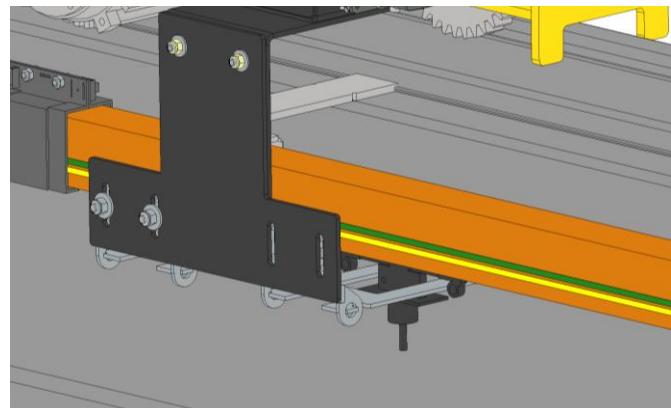


Image 7.19B Align Bridge and Tow Bar

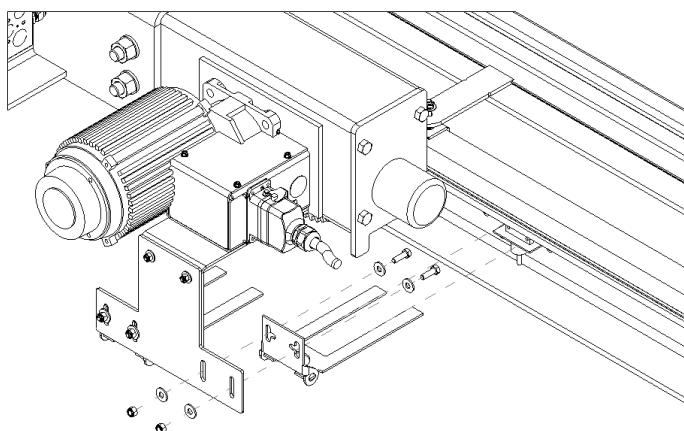


Image 7.20 Tow Bar Exploded View

20. Once the Tow Bar, Bridge, and Collector Trolley are lined up, attach the Bridge and Tow Bar using the hardware provided **(Image 7.20)**

21. Repeat steps **7.19 – 7.20** as needed for all Collector Trolley's.

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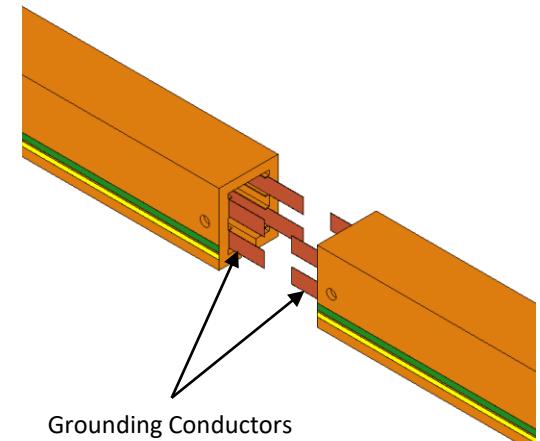


Alternate Electrotrack Electrification

If your Electrotrack is powered via line feed rather than end feed, follow these steps to power your Electrotrack.

- 1) At the desired splice to insert power, leave a 4-6" gap between the Electrotrack pieces making sure the grounding conductors are oriented the same way. *Note: each orange track is marked with a yellow and green line. This line indicates where the ground conductor is located.*

(Image 1.1)



- 2) Press a conductor coupler with a soldered wire attached onto the dimpled end of each of the 4 conductors as far as it will go. Make sure the soldered wire with the green cover goes on the grounding conductor. *Note: coupler body goes to the outside of the conductor leaving a smooth transition on the inside face of each coupler.*

(Image 1.2)

Image 1.1 Spaced Electrotrack

- 3) Push the other conductors into the corresponding coupler. Once all 4 conductors are started, use a needle nose plier to work the conductors the rest of the way in. Conductor ends must be in tight contact. **(Image 1.3)**

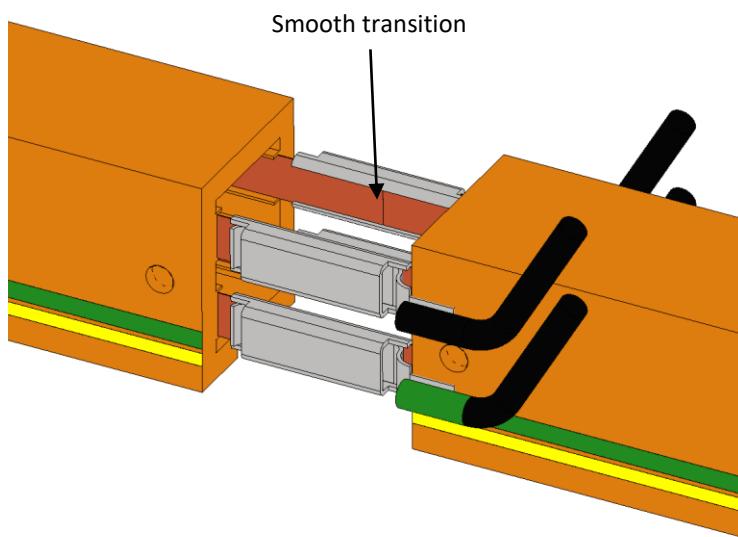


Image 1.3 Insert Other Conductors

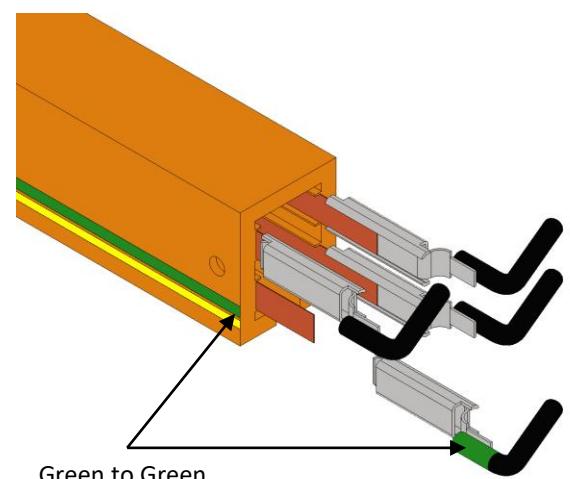


Image 1.2 Insert Conductor Couplers

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Alternate Electrottrack Electrification

- 4) Place 1 half of a splice cover (**Image 1.4A**) around the conductor couplers and tight to the casing on both sides. A pin on the cover should align with a hole in the casing (**Image 1.4B**). The holes in the splice cover should align with the wires feeding out.

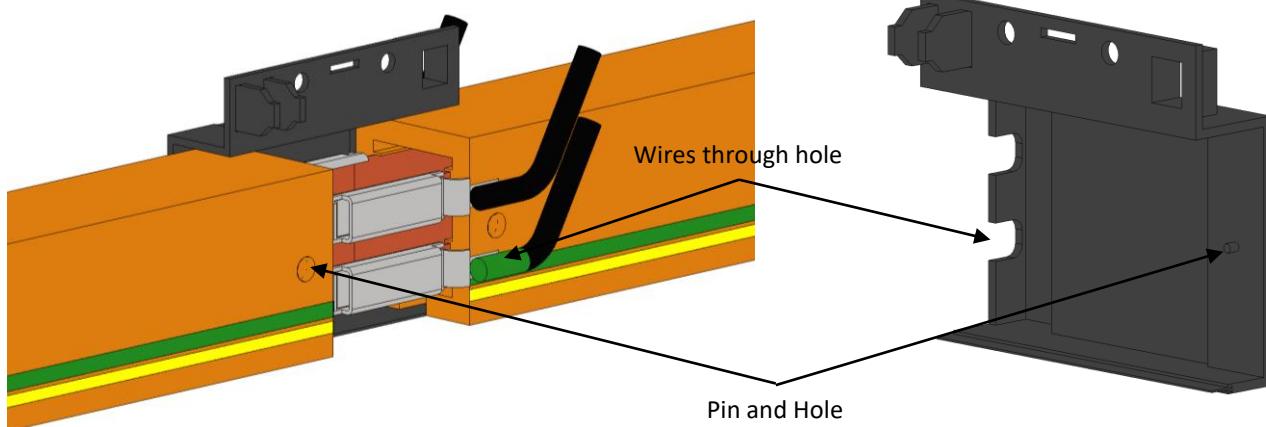


Image 1.4A Attach Splice Cover

Image 1.4B Opposite Splice Cover

- 5) If the Splice Cover with the pin needs to be put on the side without the holes in the Electrottrack, the conductor couplings will need to be turned around to feed the wires through the casing holes.
- 6) Clip the other half of the splice cover into place locking rails together. Insert provided hardware into Splice Cover Holes (**Images 1.6A & 1.6B**).

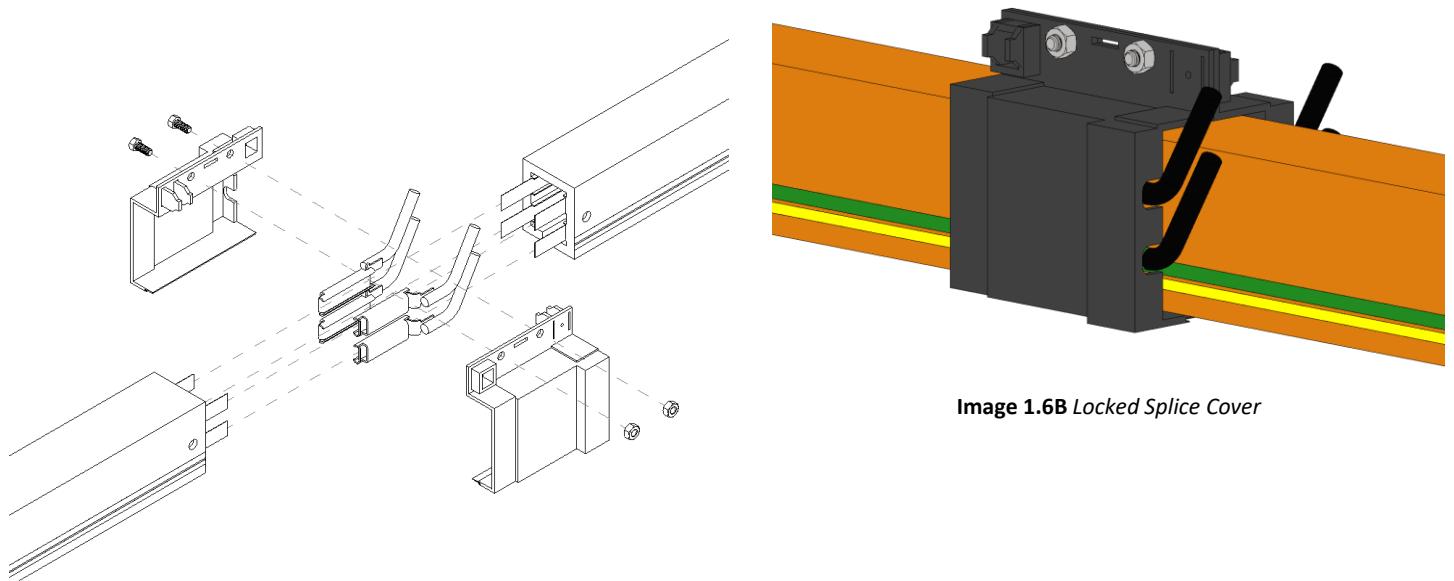


Image 1.6A Splice Cover Exploded View

Image 1.6B Locked Splice Cover

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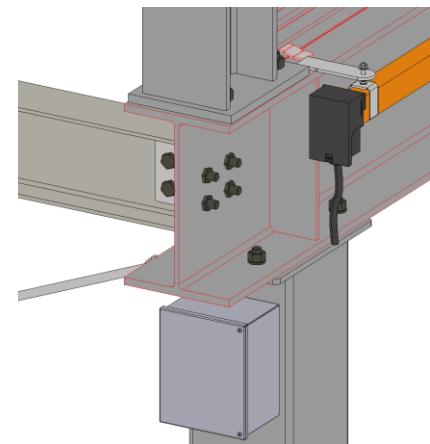
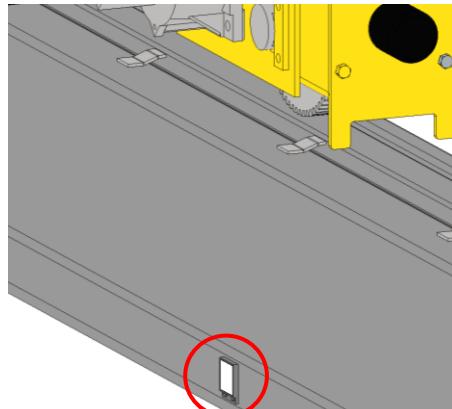
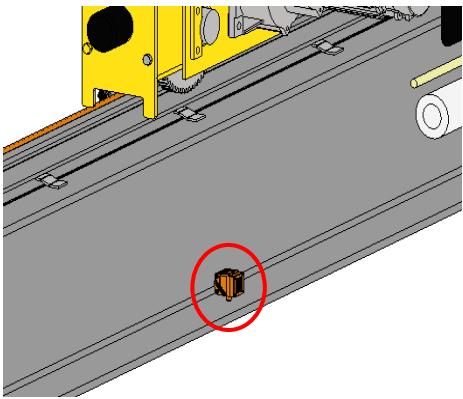
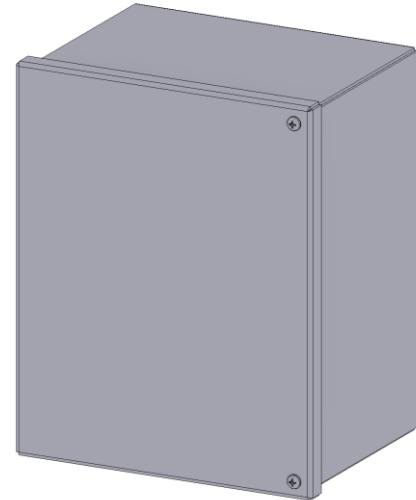
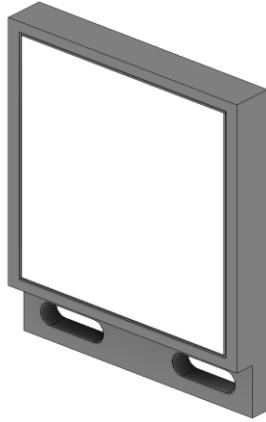
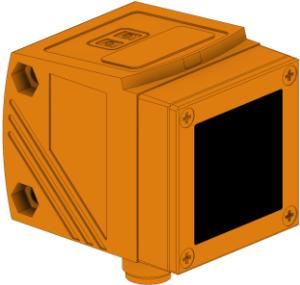
Freestanding Top Running Motorized Bridge Crane



Step 8. Moving Machinery Safety System

Mount the Laser Transceiver in the web of the runway beam with the Reflector mounted in the opposite web above the moving machinery. Wire the laser into the Supply Contactor Panel in reference to wiring schematics on pg 28.

When the moving machinery breaks the laser, the contactor will cut the supply power to the crane system. Once the machinery has moved out of the laser's path, power will be restored to the crane and it can be restarted.



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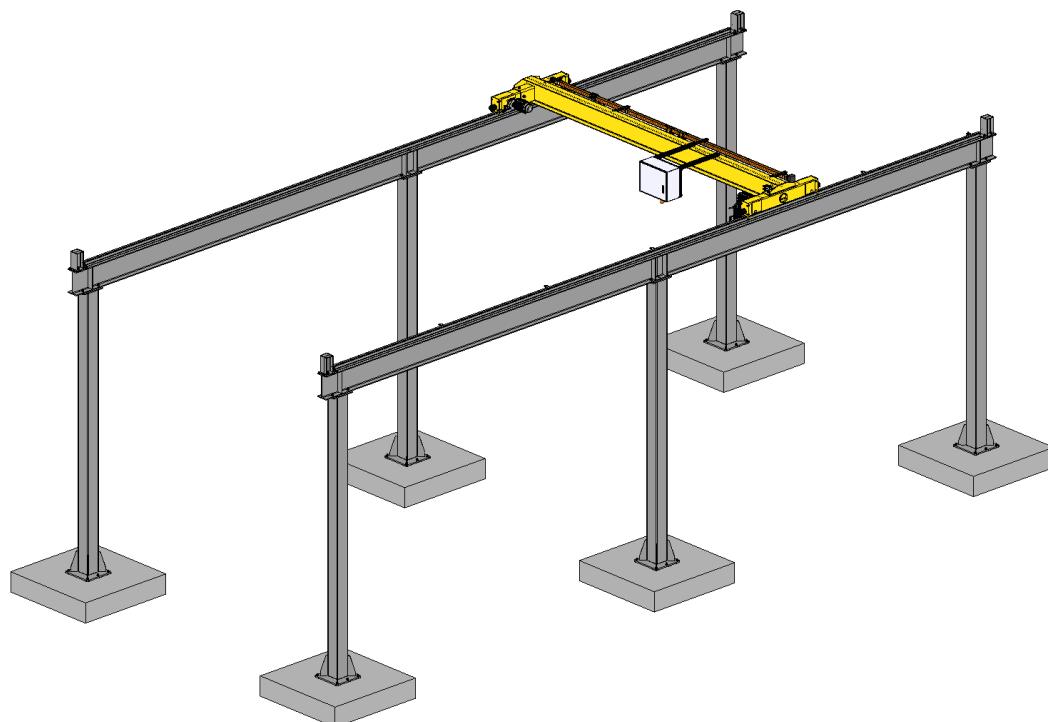
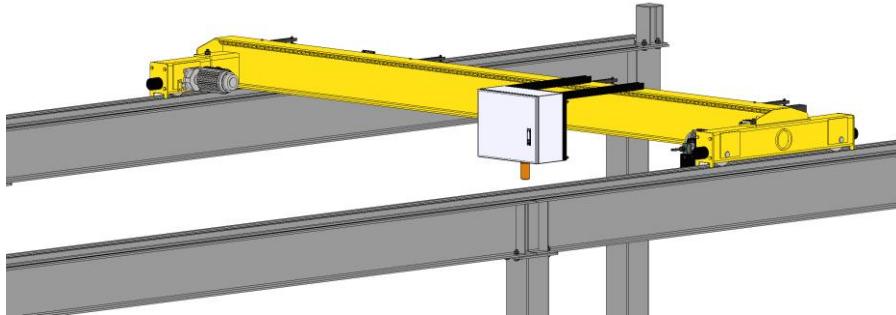


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Step 9. Touch-Up

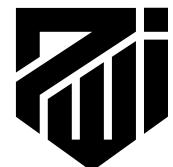
Use touch up paint (provided) as needed.



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Freestanding Top Running Motorized Bridge Crane



Final Steps

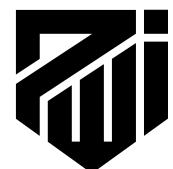
1. If sway bracing is desired (not required), be sure that crane is properly braced. Refer to [Sway Brace Installation](#).
2. Verify that all bolts are tightened to specifications.
3. Be sure all end stops are installed and functional.
4. Verify that the power supply is in conformance with crane specifications as ordered.
5. Load test is required (by others). It should be performed per latest ANSI B30.11 specification.

► **TIP: Do not throw away this manual: the maintenance schedule is included.**
Keep Packing List, Installation Manual, General Arrangement Drawing,
and any other inserts filed together in a safe place.

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Freestanding Top Running Motorized Bridge Crane



Sway Brace (optional) Installation

NOTE: SWAY BRACING BY OTHERS

Support assemblies are designed to AISC (American Institute of Steel Construction) specifications. If reduced movement of support assemblies is desired, then sway bracing (not included) can be added. The installer or end user must determine the possible locations of the bracing based on the specific application.

Bracing can be added in one of three formats, or a combination of any three.

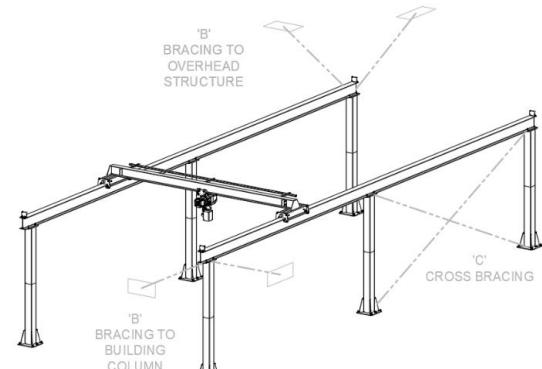


Diagram 8A. Examples of typical sway bracing locations.

A The most typical place to brace is directly to a building column. Providing a brace from a building column to the lateral (side) and longitudinal (lengthwise) axis of the support steel provides extreme rigidity throughout the system and requires only minimal locations (2 or 3 corners of the system is typically adequate, see **diagram 8A**).

B Another method is to brace back to the ceiling above the crane. Again, bracing at the corners of the system in both a lateral and longitudinal direction is sufficient (see '**B**' in **diagram 8A**), providing the distance to the ceiling is not greater than 10 feet. For distances greater than 10 feet, additional points may need to be braced both laterally and longitudinally at the discretion of the end user and/or the installer.

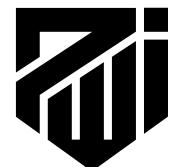
C Finally, if the system is located at a point where it is not practical or possible to brace to the building columns or the ceiling structure, cross bracing can be used. This can be added at the sides of the system (see '**C**' in **diagram 8A**) to control longitudinal sway, or across the open ends to limit lateral motion (not shown). This can also be added to the top of the system but should be checked to make sure that it does not interfere with the travel of the bridge.

It should be noted that the use of sway bracing is purely subjective because it is not a requirement of PWI, Inc. No specifications exist detailing appropriate methods, and the ultimate quantity and type is at the discretion of the user and installer. **If bracing, always determine if the building structure is adequate.**

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Freestanding Top Running Motorized Bridge Crane



ASTM A325 STRUCTURAL BOLTS									
Bolt Diameter	TPI	Tightening Torque Range (ft-lbs)							
		Plain		Plain, Light Oil		Plain, Heavy Oil		Galvanized, Waxed	
		Min	Max	Min	Max	Min	Max	Min	Max
1/2	13	100	117	80	94	60	70	50	58
5/8	11	198	240	158	192	119	144	99	120
3/4	10	350	425	280	340	210	255	175	213
7/8	9	569	685	455	548	341	411	284	343
1	8	850	1,017	680	814	510	610	425	508
1 1/8	7	1,200	1,444	960	1155	720	866	600	722
1 1/4	7	1,687	2,042	1350	1634	1012	1225	844	1,021
1 3/8	6	2,223	2,681	1778	2145	1334	1609	1,111	1,341
1 1/2	6	2,950	3,575	2360	2860	1770	2145	1,475	1,788

Table 2

SAE Grade 5				
Bolt Diameter	TPI	Tightening Torque Range (ft-lbs)		
		Min	Mid	Max
		Lubricated	Zinc Dry	Plain Dry
1/4	20	6	7	8
5/16	18	13	14	17
3/8	16	23	26	31
7/16	14	37	42	49
1/2	13	57	64	75
5/8	11	82	92	109
3/4	10	113	128	150
7/8	9	200	227	267
1	8	322	365	429

Table 3

SAE Grade 8				
Bolt Diameter	TPI	Tightening Torque Range (ft-lbs)		
		Min	Mid	Max
		Lubricated	Yellow Zinc Dry	Plain Dry
1/4	20	9	10	12
5/16	18	18	21	24
3/8	16	33	37	44
7/16	14	52	59	70
1/2	13	80	90	106
5/8	11	159	180	212
3/4	10	282	320	376
7/8	9	455	515	606
1	8	681	772	909

Table 4

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Freestanding Top Running Motorized Bridge Crane



CRANE OPERATOR INSTRUCTIONS

- 1. General:** At PWI, safety is our top priority, especially when operating overhead cranes and jib cranes in work areas where personnel are present. Proper training and attention to detail are essential to prevent accidents and ensure safe operation. These guidelines are designed to supplement your existing safety protocols and OSHA regulations, not replace them. Reviewing this information will help operators better understand safe practices, protecting both employees and equipment on the job site. It is important to note that these guidelines serve as recommendations for crane operators. Employers are responsible for ensuring their teams are aware of and comply with all relevant federal, state, and local regulations and that operators are adequately trained.
- 2. Operator Qualifications:** Safe crane operation demands skill, attentiveness, and a strong commitment to safety. All crane operators should meet the following criteria:
 - A. Language Proficiency: The operator must understand the appropriate language and be able to read safety and instruction materials.
 - B. Legal Age: Operators must meet the minimum legal age requirement for operating such equipment.
 - C. Health and Fitness: Operators must have sufficient vision and hearing (corrected if necessary) and must not suffer from health conditions, such as heart issues, that could impair performance.
 - D. Training and Knowledge: Operators must have read and understood all operating instructions, completed proper training, and demonstrated their knowledge through practical application.
- 3. Operating the Jib Crane Boom:**
 - A. Before using the boom, ensure the hook is positioned high enough to avoid obstructions.
 - B. Align the jib boom directly over the load before attempting to lift.
 - C. Operate the boom gradually, starting slowly and increasing speed smoothly. As the boom approaches the stopping point, reduce speed to ensure a controlled stop.
- 4. Operating the Trolley:**
 - A. Position the hoist directly over the load before lifting. Ensure all slack in the slings is taken up.
 - B. Avoid starting to lift until the hoist is properly centered to prevent the load from swinging.
 - C. Start trolley motion at a slow speed and decelerate gradually when nearing the destination.
- 5. Hoist Operation:**
 - A. Refer to the operating manual specific to your lifting equipment for detailed instructions. Always follow the manufacturer's recommendations and guidelines for safe operation.



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Freestanding Top Running Motorized Bridge Crane



6. **Know Your Crane:** Crane operators must be familiar with the key components of a crane and possess a thorough understanding of crane control functions and movements. Operators must know the location and correct operation of the main disconnecting means for all power to crane attachments.
7. **Responsibility:** Crane operators bear direct responsibility for the safe operation of the crane. If there is any doubt regarding **safety**, the operator must stop the crane and refuse to handle loads until either:
 - A. Safety is ensured, or
 - B. The operator is directed to proceed by a supervisor, who then assumes full responsibility for the safety of the lift.
8. **Riding Policy:** Never allow anyone to ride on the hook or a load.
9. **Inspection:** At the start of each shift, test crane movements and all attachments. If an issue is identified, report it immediately to a supervisor, and ensure corrective action is taken before operating.
10. **Operating:** A skilled crane operator ensures smooth and controlled crane operation. Adhere to the following guidelines for safe and efficient crane handling:
 - A. Move the crane smoothly to avoid abrupt or jerky load movements. Remove slack from slings and hoisting ropes before lifting.
 - B. Position the crane directly over the load before lifting to minimize swinging. Avoid swinging loads to reach areas not directly beneath the crane.
 - C. Keep crane-hoisting ropes vertical. Cranes must not be used for side pulls.
 - D. Ensure the area around the load is clear, and everyone is aware of the movement.
 - E. Never exceed the rated load capacity of the crane, slings, or lifting devices.
 - F. Confirm slings, chains, or lifting devices are fully seated in the hook saddle with the latch closed (if equipped).
 - G. Verify the load and/or block is high enough to clear obstructions when moving the boom or trolley.
 - H. Do not leave a suspended load unattended. When holding a load, keep the power on and stay at the controls with the load positioned as low as possible.
 - I. Do not lift with loose sling hooks. Store unused hooks securely or switch to an appropriate sling.
 - J. Remove all slings or cables from crane hooks when not in use to prevent snagging.
 - K. Avoid carrying loads or blocks over personnel. Exercise additional caution with magnets or vacuum devices, as load failure can occur.
 - L. Operator Procedure when they leave the crane:
 - a. Raise hooks to an intermediate position.
 - b. Park the crane at a designated location.
 - c. Turn all controls off.
 - d. Shut off the main switch.
 - e. Visually inspect the area before leaving.



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Freestanding Top Running Motorized Bridge Crane



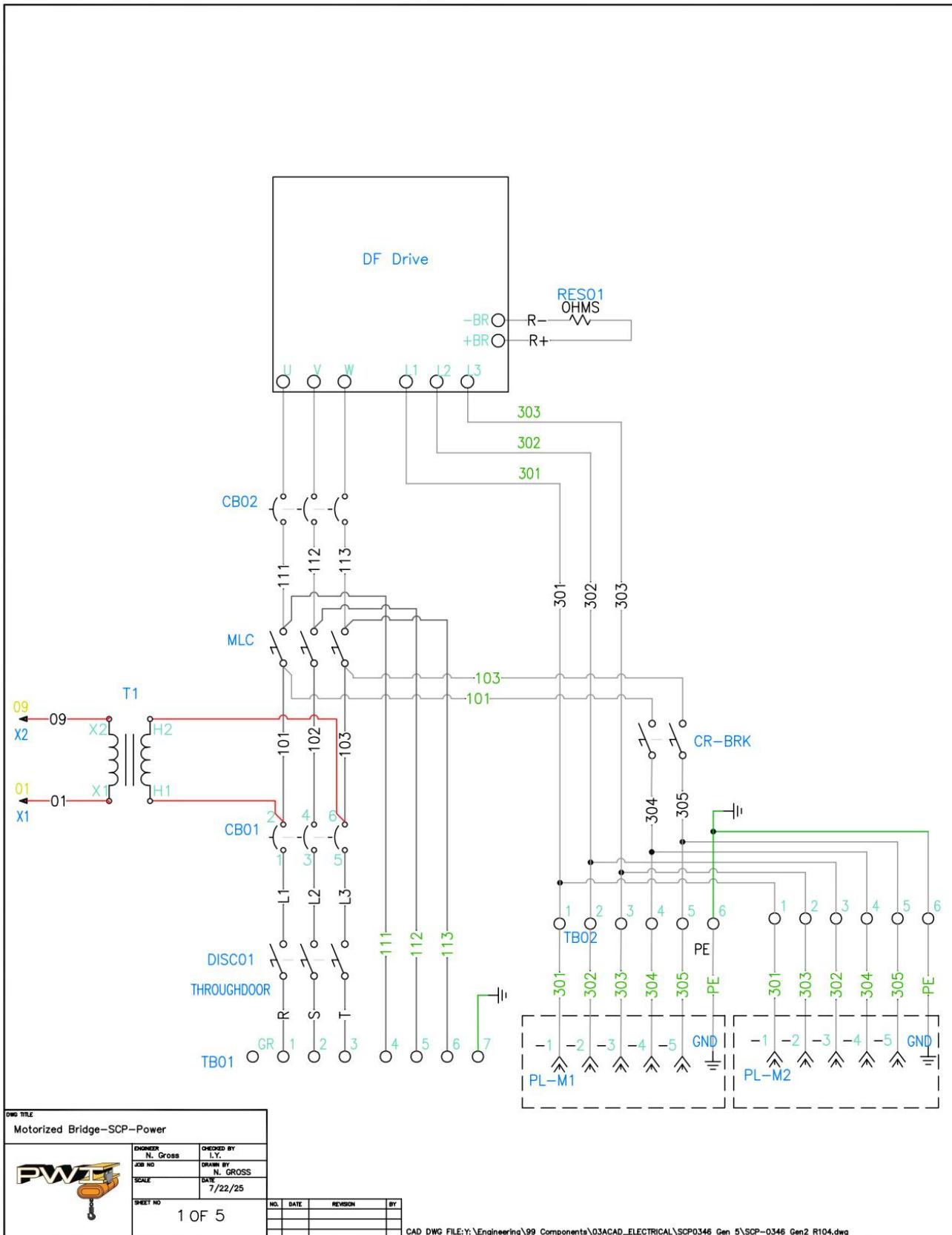
- 11. Emergency Procedures:** In emergencies or during maintenance, display warning signs and lock the main switch in the "off" position. This applies regardless of who is performing the task.
- 12. End Stops:** Contact end stops cautiously. Ensure the safety of people below and communicate clearly with other crane operators in the area.
- 13. Safety Features:** All safety mechanisms and features provided by PWI are essential for crane operation. Do not disable or remove any safety features. Any such actions void all warranties.



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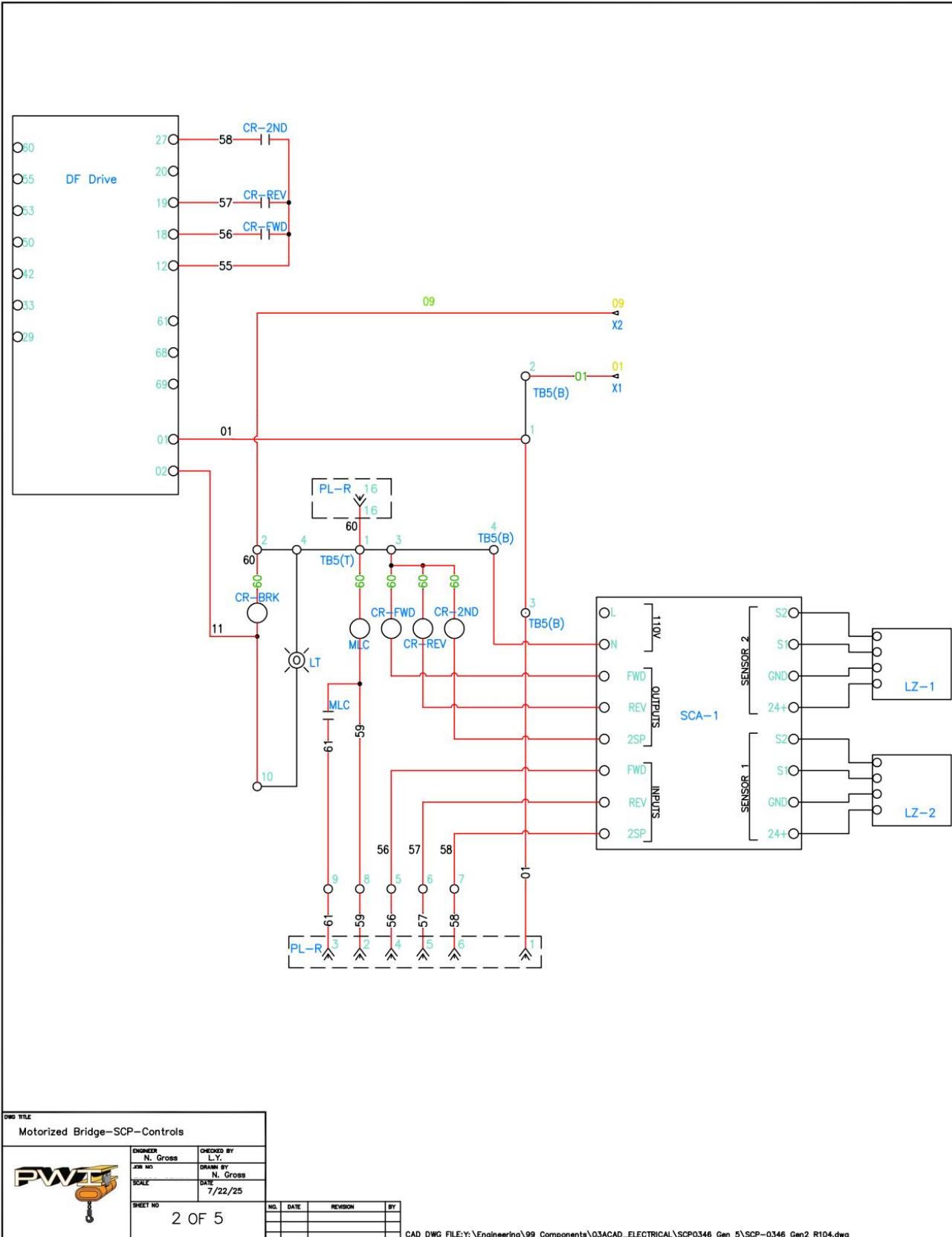
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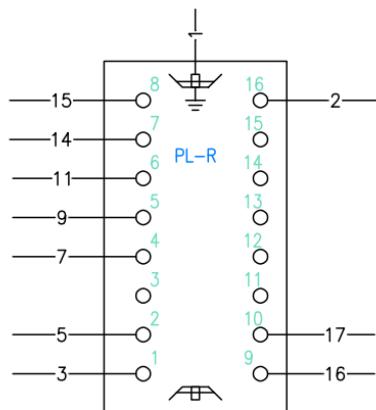
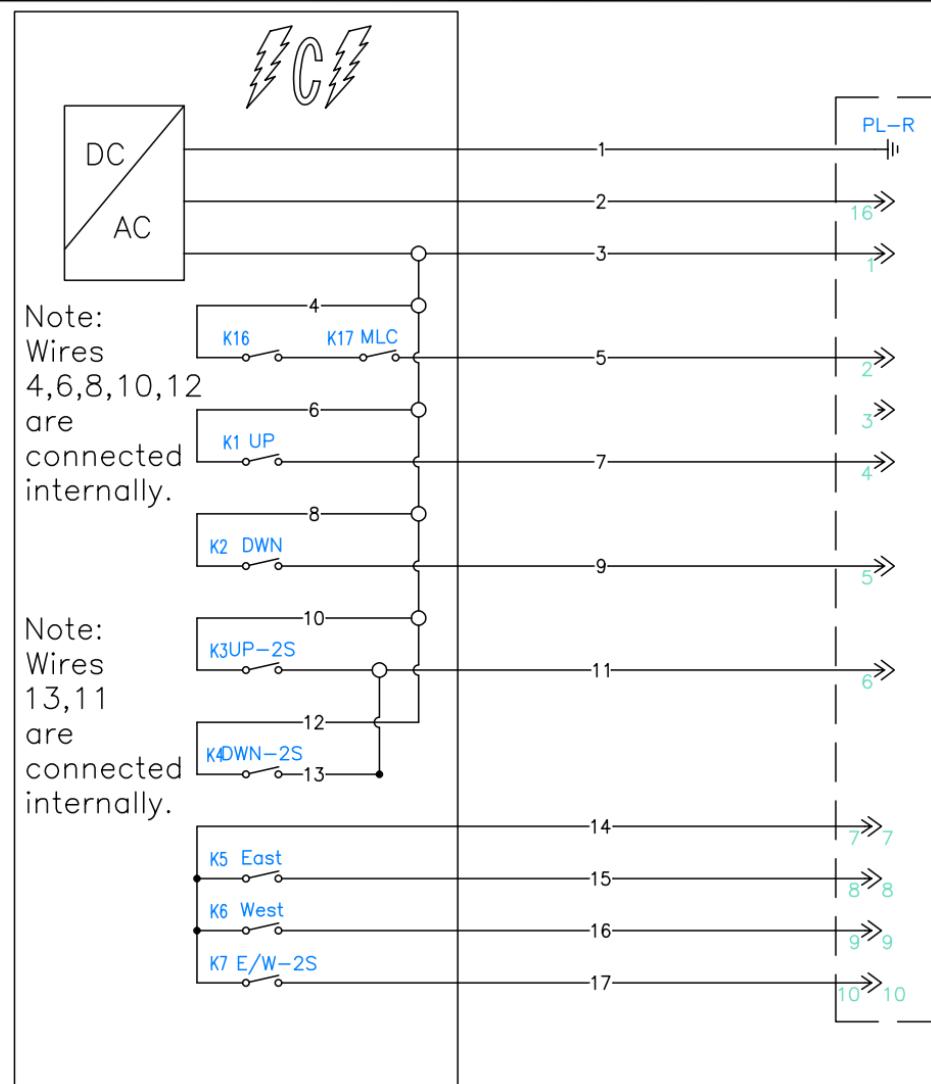
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Freestanding Top Running Motorized Bridge Crane



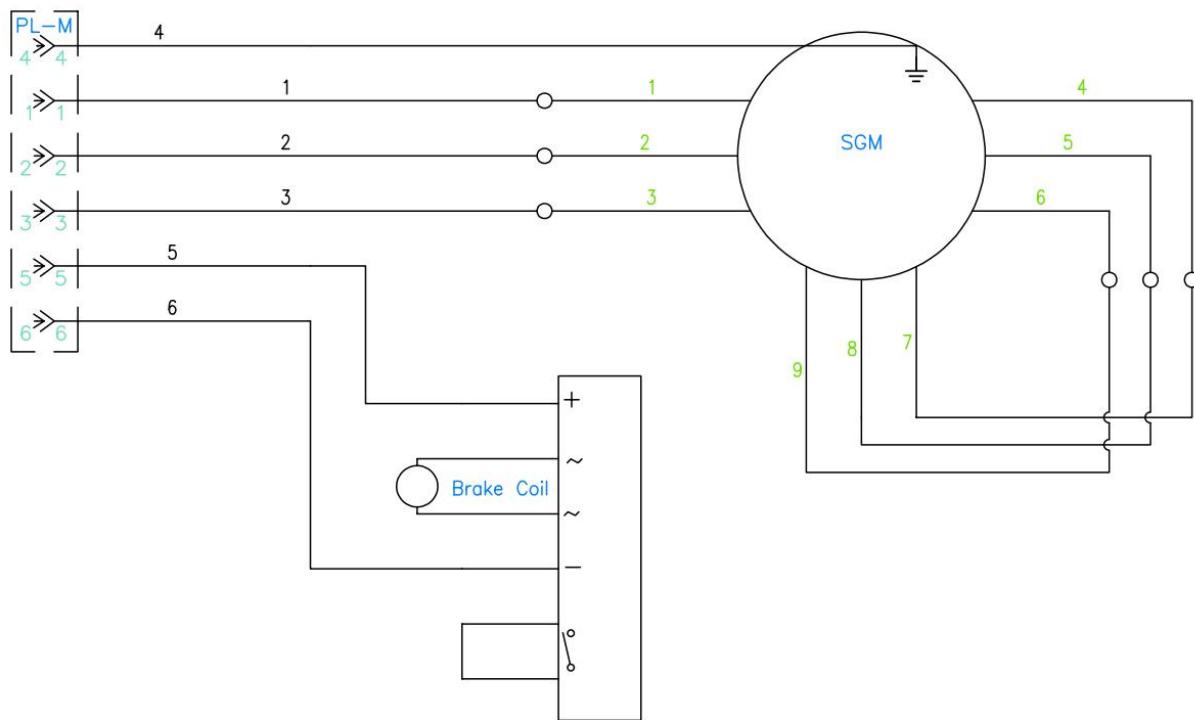
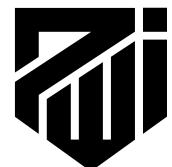
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Motorized Bridge-Radio	
ENGINEER N. Gross	CHECKED BY L.Y.
JOE NO	DRAWN BY N. Gross
SCALE 7/22/25	DATE 7/22/25
SHEET NO 3 OF 5	NO. DATE REVISION BY

CAD DWG FILE: Y:\Engineering\99 Components\03ACAD_ELECTRICAL\Standard Motorized Bridge Crane\Standard Bridge.dwg

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Freestanding Top Running Motorized Bridge Crane



DRAFTING TITLE	
SGM Motors	
	
ENGINEER N. Gross	CHECKED BY L.Y.
JOB NO	DRAWN BY N.G.
SCALE No Scale	DATE 7/22/25
SHEET NO 4 OF 5	

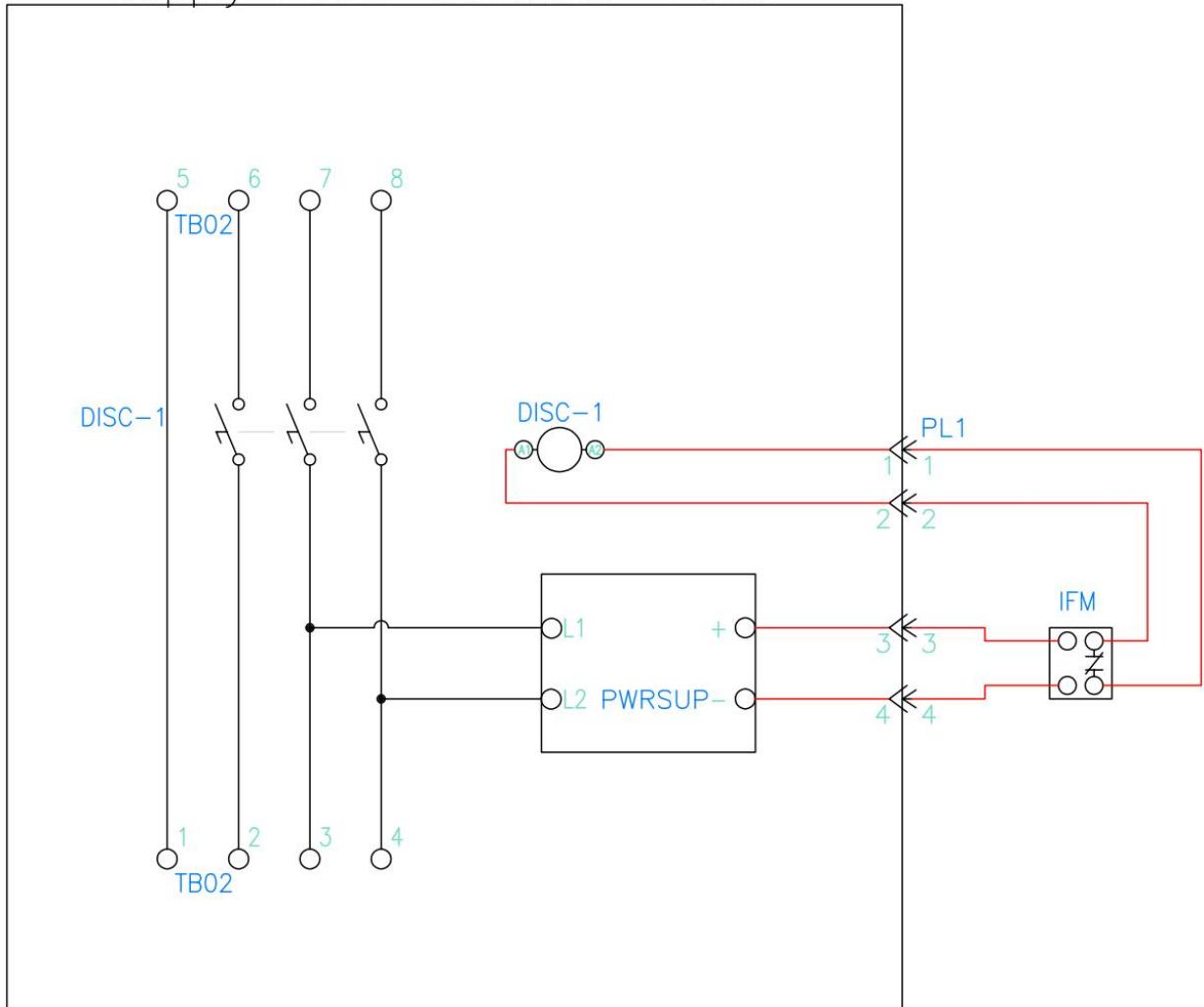
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Freestanding Top Running Motorized Bridge Crane



Supply Power Contactor Panel



DRAFT TITLE		
Supply Power Contactor Panel		
	ENGINEER N. Gross	CHECKED BY L.Y.
	JOB NO	DRAINED BY N. Gross
	SCALE	DATE 7/22/25
	SHEET NO 5 OF 5	

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Freestanding Top Running Motorized Bridge Crane



GENERAL WARRANTY

This warranty will not apply to any product that has been repaired or altered outside of PWI manufacturing plant, or without specific instructions from PWI to make alterations. PWI will in no case, allow or offer reimbursement for outside sources to perform repairs or make alterations to product in reference. If the product has (in PWI's judgment), had alterations made which adversely affect its serviceability or was subject to misuse, negligence, accident, or operated contrary to instructions or common practice, warranty shall be considered void.

Defective items will be repaired or replaced and returned to PWI at the cost of the owner. If PWI, at its discretion, finds the warranty claims to be justifiable, PWI will compensate by means of replacing or repairing faulty products or components free of charge. The sole liability of PWI for warranty claims is limited to those here. In no event will PWI be liable for damages in excess of the original sale price of the defective product, or for any consequential damages, nor will PWI be liable for any special or other work done unless specifically agreed to in writing. This warranty does not include or apply to fire, natural disasters, or other Acts of God.

Should the warrantee destroy, intentionally or not, any part of the warranted product, or any evidence concerning the origin of an alleged defect, or try to conceal evidence of causation, this warranty is cancelled, and warrantee will have no claim against PWI whatsoever.

This warranty does not cover coatings on any PWI products including paint, powder-coat, zinc, or galvanized coatings. Coating life can vary greatly based on the ambient environment your PWI product is installed in, which is simply out of the manufacturer's control. Touch-up painting or coating repair (after initial installation by PWI or customer) shall be the responsibility of the owner, unless specifically guaranteed in writing on project quotation.

Any interpretation of this warranty shall be done in common pleas court in Indianapolis under Indiana law.

ALL OTHER REPRESENTATIONS, EXPRESS OR IMPLIED, WARRANTY, OR LIABILITY RELATING TO THE CONDITION OR USE OF THE PRODUCT ARE SPECIFICALLY, DISAVOWED, AND IN NO EVENT SHALL PWI BE LIABLE TO BUYER, OR ANY THIRD PARTY, FOR ANY DIRECT OR INDIRECT CONSEQUENTIAL OR INCIDENTAL DAMAGES



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Freestanding Top Running Motorized Bridge Crane



LIMITED WARRANTY

STRUCTURAL: 3-Year (36 Month) Parts & Workmanship Warranty

Structural items include but are not limited to columns, headers, runways, and other stationary components of this PWI jib crane.

Unless otherwise specified, PWI guarantees that the structure or this product is free from material defects in design, materials, and workmanship under normal use, proper maintenance, and service. A corrosive or abrasive atmosphere is not to be considered a normal atmosphere.

This warranty is strictly limited to 36 months for single shift operation or 6,000 hours after installation, or 38 months after shipment, whichever is shorter. Within ten days after defect is found, warrantee must deliver a written notice to PWI. All requested warranty information must be received promptly by PWI in no more than 5 business days.

MECHANICAL: 1 Year (12 Month) Parts & Workmanship Warranty

Mechanical items include but are not limited to all types of Overhead Cranes, and other non-stationary PWI products that are designed for specific functional operation.

Unless otherwise specified, PWI guarantees that this mechanical product is free from material defects in design and workmanship under normal use, proper maintenance, and service.

This warranty is strictly limited to 12 months for single shift operation or 2,000 hours after installation, or 14 months after shipment, whichever is shorter. Within ten days after defect is found, warrantee must deliver a written notice to PWI. All requested warranty information must be received promptly by PWI in no more than 5 business days.

All standard non-engineered products including but not limited to hoists, trolleys, wheels, gearmotors, controls, and safety products, will fall under the default warranty of that specific manufacturer.



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Freestanding Top Running Motorized Bridge Crane



PERIODIC INSPECTION AND LUBRICATION RECOMMENDATIONS

The following is a checklist to be followed in performing periodic inspections and preventative maintenance on PWI Crane Systems. It is intended that this checklist be supplemented with any additional instruction sheets and maintenance manuals sent with each job.

The frequency of inspection and lubrication recommendations presented herein is based upon normal operating conditions of one complete handling cycle every 10 minutes throughout a 40-hour week. If the actual duty cycle of a particular unit is greater or less than this, the inspections and lubrications should be performed more frequently or less frequently in proportion.

Each industry has conditions peculiar to it, which may cause wear of certain parts. The tabulation given is only general and may be supplemented by an individual maintenance department program to meet its own particular requirements. Particular attention should be given to corrosive conditions, excessive vibrations, extreme ambient temperature variations, and rough handling conditions.

Questions regarding damaged, worn or cracked equipment components should be directed to the PWI Inside Sales Department at 574-646-2015.

The recommendations contained herein are to be supplemented by any vendor instructions, which are included in this manual.

Power should be off and locked when performing maintenance.

Please check the state and local code manuals in your area to ensure compliance

Parts: Your system is custom designed for your space. The drawings that you received are specific to your system. PWI has copies of your drawings in a file under the company name or the name of the purchaser. If you require replacement parts, please call or email PWI and we will be glad to assist you in getting what you need. parts@pwiworks.com



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Freestanding Top Running Motorized Bridge Crane



RUNWAYS & SUPPORT STEEL

COMPONENT	MAINTENANCE	FREQUENCY
Header-Column Hardware	Check for loose bolts & cracked fittings. Check for full compression of lock washer. Bolt should be tightened to manufacturer's specifications.	Every 1,000 hours or 6 months
Header-Runway Hardware	Check for loose bolts & cracked fittings. Check for full compression of lock washer. Bolt should be tightened to manufacturer's specifications.	Every 1,000 hours or 6 months
Column Anchoring	Check for loose bolts & cracked fittings.	Every 1,000 hours or 6 months
Sway Brace Connection (If used)	Check for loose bolts & cracked fittings.	Every 1,000 hours or 6 months
Runway	Check for runway wear or damage.	Every 2,000 hours or yearly
Joints	Check for loose or worn hardware or if welded type, for incipient cracks. Check for runway alignment and that wheel rolling surface is flush.	Every 2,000 hours or yearly
End Stops	Check for loose bolts and for incipient cracks.	Every 2,000 hours or yearly
Paint	Clean periodically and repaint where corrosion is present.	Every 2,000 hours or yearly



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Freestanding Top Running Motorized Bridge Crane



BRIDGE

COMPONENT	MAINTENANCE	FREQUENCY
Controls	Check for burned contacts, broken shading coils, worn or cracked arc barriers, auxiliary contacts, and proper seating.	Every 1,000 hours or 6 months
Push Buttons & Pendant	Check contacts. Tighten leads. Check for sticking buttons. Check ground wire continuity. Check pendant cable top and bottom for broken wires. Check strain chain to see that any pulling force is not put on pendant cables.	Every 1,000 hours or 6 months
Bridge Girder	Check Bridge Girder for wear or damage.	Every 2,000 hours or yearly
End Stops	Check for loose bolts and for incipient cracks.	Every 2,000 hours or yearly
Paint	Clean periodically and repaint where corrosion is present.	Every 2,000 hours or yearly

END TRUCK, & HOIST TROLLEY

COMPONENT	MAINTENANCE	FREQUENCY
Structural Frame & Load Bars	Check for incipient cracks in welds and castings. Check for loose bolts.	Every 2,000 hours or yearly
Suspension Point	Check for wear and loose or missing screws or pins.	Every 150 hours or 1 month
Wheels & Guide Rollers	Check for loose wheel bearings. Check wheels for proper contact and tracking on rail. Check wheel diameter for wear (Replace when 1/4" under original diameter). Check axle nuts for tightness.	Every 500 hours or 3 months



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Freestanding Top Running Motorized Bridge Crane



FESTOON ELECTRIFICATION

COMPONENT	MAINTENANCE	FREQUENCY
Connections	Check connections to ensure no wires are worn and no conductors are exposed.	Every 150 hours or 1 month
Insulation	Check to ensure no damage is visible.	Every 2,000 hours or yearly
Complete System	In environments that are subject to considerable buildup of dust, especially conductive dust, remove this dust by brushing.	Every 2,000 hours or yearly

STARKE ELECTROTRACK

COMPONENT	MAINTENANCE	FREQUENCY
Rail	Check for corrosion, bowing, or sagging. Check alignment at moving gaps. Realign if necessary.	Every 2,000 hours or yearly
Couplings	Check bolt or screw tightness. Check for corroded contact surfaces.	Every 2,000 hours or yearly
Supports	Check for loose bolts and/or screws and bent brackets.	Every 2,000 hours or yearly
Insulators	Check for loose bolts, sheared support ears, current carrying deposits on surface.	Every 2,000 hours or yearly
Rail Covering	Check for accidental abrasion and peeled covering.	Every 2,000 hours or yearly
Current Taps	Check bolt and terminal screw tightness. Check for corroded contact surface.	Every 2,000 hours or yearly
Ground	Check for ground continuity. Check at load side of disconnect switch (current off), with meg-ohm tester, for overall system insulation resistance.	Every 2,000 hours or yearly
Collectors	Check for worn shoes. Check flexible leads from wheel clevis pigtail or slide shoe shaft. Check tightness of lead connections. Check for cracked insulators. Replace if necessary.	Every 750 hours or 4 months

HOIST (Refer to Hoist Manufacturer)



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Freestanding Top Running Motorized Bridge Crane



Notes

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