EFFECTIVE: March 8, 2023

INSTALLATION MANUAL

TIGER TRACK WORKSTATION CRANE AND MONORAIL OWNER'S MANUAL

1/8 Ton through 2 Ton Capacity

Product Code and Serial Number

⚠ WARNING

This equipment should not be installed, operated or maintained by any person who has not read and understood all the contents of this manual. Failure to read and comply with the contents of this manual can result in serious bodily injury or death, and/or property damage.

HARRINGTON
A KITO GROUP COMPANY

TIGER TRACK

Table of Contents

1.0 Important Information and Warnings

1.1 Terms and Summary

This manual provides important information for personnel involved with the installation, operation and maintenance of this product. Although you may be familiar with this or similar equipment, it is strongly recommended that you read this manual before installing, operating or maintaining the product.

Danger, Warning, Caution and Notice - Throughout this manual there are steps and procedures that can present hazardous situations. The following signal words are used to identify the degree or level of hazard seriousness.

⚠ DANGER Danger indicates an imminently hazardous situation which, if not avoided, ***will*** result in ***death or serious injury***, and property damage.

⚠ WARNING Warning indicates an imminently hazardous situation which, if not avoided, ***could*** result in ***death or serious injury***, and property damage.

⚠ CAUTION Caution indicates a potentially hazardous situation which, if not avoided, ***may*** result ***minor or moderate injury*** or property damage.

NOTICE Notice is used to notify people of installation, operation, or maintenance information which is important but not directly hazard-related.

⚠ CAUTION

These general instructions deal with the normal installation, operation, and maintenance situations encountered with the equipment described herein. The instructions should not be interpreted to anticipate every possible contingency or to anticipate the final system, crane, or configuration that uses this equipment. For systems using the equipment covered by this manual, the supplier and owner of the system are responsible for the system's compliance with all applicable industry standards, and with all applicable federal, state and local regulations/codes.

This manual includes instructions and parts information for a variety of crane types. Therefore, all instructions and parts information may not apply to any one type or size of a specific crane. Disregard those portions of the instructions that do not apply.

Record your crane's Model and Serial Number (see Crane Drawing and **Section 9**) on the front cover of this manual for identification and future reference to avoid referring to the wrong manual for information or instructions on installation, operation, inspection, maintenance, or parts.

Use only Harrington authorized replacement parts in the service and maintenance of this crane.

⚠ WARNING

Equipment described herein is not designed for and **MUST NOT** be used for lifting, supporting, or transporting people, or for lifting or supporting loads over people.

Equipment described herein should not be used in conjunction with other equipment unless necessary and/or required safety devices applicable to the system, crane, or application are installed by the system designer, system manufacturer, crane manufacturer, installer, or user.

Modifications to upgrade, rerate, or otherwise alter this equipment shall be authorized only by the original equipment manufacturer.

Equipment described herein **MUST NOT** be used to handle hot molten material. Refer to ASTM E2349 “Standard Practice for Safety Requirements in Metal Casting Operations: Sand Preparation, Molding, and Core Making; Melting and Pouring; and Cleaning and Finishing”.

Equipment described herein **MUST NOT** be used in application where exposure to temperatures exceeds the maximum allowable temperature as stated in Section 2.0 of this manual.

Only trained and competent personnel should inspect and repair this equipment. Only competent erection personnel familiar with standard fabrication practices should be employed to assemble Harrington’s cranes because of necessity in interpreting these instructions. Harrington is not responsible for quality of workmanship performed during crane installation.

Before installing any ceiling suspended system, consult a structural engineer or qualified person to evaluate the supporting structure of the building to determine the suspension mount points and configurations needed. Failure to do so could result in serious injury, death or property damage.

Consult with a qualified structural engineer to determine if your support structure is adequate to support the loads generated by anchor bolt force, overturning moment, or axial load of your crane.

Crane cannot be utilized as an electrical or welding ground: a separate ground wire is required.

Overloading and improper use can result in injury.

All welds of your supporting structure must meet American Welding Society (AWS) specification D14.1 “Specification for Welding of Industrial and Mill Cranes and other Material Equipment.”

Failure to read and comply with any one of the limitations noted herein can result in serious bodily injury or death, and/or property damage.

NOTICE

It is the responsibility of the owner/user to install, inspect, test, maintain, and operate a crane in accordance with the applicable portions of OSHA Specification 1910.179 “Overhead and Gantry Cranes,” ANSI B30.17, “Cranes and Monorails (with Underhung Trolley or Bridge),” ANSI MH27.2 “Enclosed Track Underhung Cranes and Monorail Systems,” and any other applicable standards.

It is the responsibility of the owner/user to have all personnel that will install, inspect, test, maintain, and operate a crane read the contents of this manual and applicable portions of OSHA Specification 1910.179 “Overhead and Gantry Cranes,” ANSI B30.17, “Cranes and Monorails (with Underhung Trolley or Bridge),” ANSI MH27.2 “Enclosed Track Underhung Cranes and Monorail Systems,” and any other applicable standards.

If the crane owner/user requires additional information, or if any information in the manual is not clear, contact Harrington or the distributor of the crane. Do not install, inspect, test, maintain, or operate this crane unless this information is fully understood.

A regular schedule of inspection of the crane in accordance with the requirements of OSHA Specification 1910.179 “Overhead and Gantry Cranes,” ANSI B30.17, “Cranes and Monorails (with Underhung Trolley or Bridge),” ANSI MH27.2 “Enclosed Track Underhung Cranes and Monorail Systems,” and any other applicable standards should be established, and records maintained.

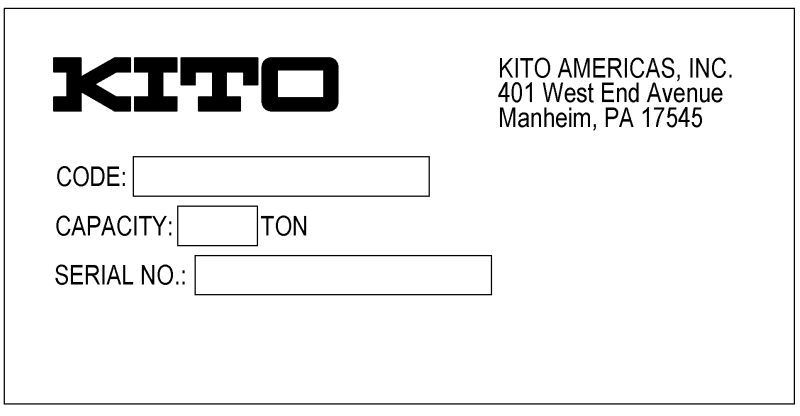
Dimensions and figures contained in this installation manual are for reference only and may differ for your particular application. Please refer to the Crane Drawing included with your crane.

1.2 Warning Tags and Labels

This crane may be part of a lifting system including a hoist and trolley. It is the responsibility of the owner of such a lifting system to ensure that the lifting system be equipped with warning labels in accordance with applicable industry standards.

Nameplate

Tiger Track workstation cranes are provided with nameplates on the bridge tracks or end of a monorail track that contain identifying information for the specific system. Refer to the nameplate and record the system’s serial number on the front of this manual for identification and future reference to avoid referring to the wrong manual for information or instructions on installation, operation, inspection, maintenance, or parts.



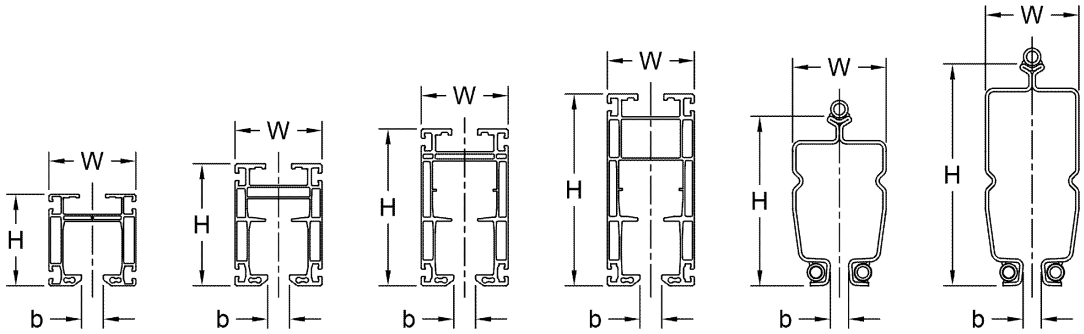
Tiger Track Workstation Crane Nameplate

2.0 Technical Information

2.1 Specifications & Dimensions

Profile Features

Table 2-1 Track Cross Section Dimensions – Metric Units



ALU2 ALU3 ALU4 ALU5 S200 S260

Product Code	Material	H in. (mm)	W in. (mm)	B in. (mm)	Net Weight lbs./ft (kg/m)
ALU2	Aluminum	4.1 (105)	3.9 (100)	1.0 (25)	11 (5)
ALU3	Aluminum	5.5 (140)	3.9 (100)	1.0 (25)	17.6 (8)
ALU4	Aluminum	7.1 (180)	3.9 (100)	1.0 (25)	20 (9)
ALU5	Aluminum	8.7 (220)	3.9 (100)	1.0 (25)	24.2 (11)
S200	Steel	7.8 (197)	4.2 (108)	0.8 (21)	39.7 (18)
S260	Steel	10.1 (257)	4.2 (108)	0.8 (21)	48.5 (22)

2.2 Operating Conditions and Environment

Tiger Track workstation crane systems are designed for the following environment:

- Indoor operation
- Ambient temperatures between 32°F to 122°F (0°C to 50°C) freestanding structure, runway, bridge and enclosed track trolleys

NOTICE Ambient operation temperatures of a crane system will vary as a result of the respective hoist connected to the system. For example, an electric hoist will reduce the maximum ambient temperature capability of the entire crane system. Refer to hoist owner's manual for operating conditions of the specific hoist used on your crane system.

- Non-condensing atmosphere and maximum relative humidity of 80%

Tiger Track light crane systems **may not** be used in the following environment:

- Outdoors
- Industrial facilities with profuse accumulation of conducting deposits (e.g. galvanizing facilities and pickling plants)
- For high-risk applications such as transporting molten metal or use related to nuclear safety

⚠ CAUTION Ensure adequate lighting, proper equipment for the working site and appropriate working procedures.

Environment must correspond to the conditions for which the workstation crane system is designed, including:

- Temperature/Radiance
- Dust
- Humidity
- Handling hazardous materials

• Fire risk
• Other possible conditions

Consult the manufacturer before deploying the crane if conditions deviate from the standard operating conditions (e.g. harsh environment or high temperatures).

⚠ CAUTION Safe operation of the light crane system can only be ensured under the specified operating environment.

2.3 Crane Terms and Systems Overview

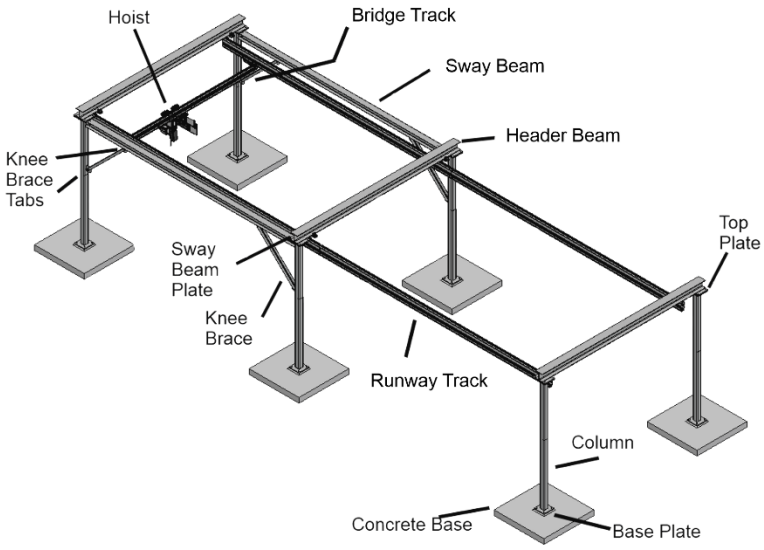


Figure 2-1 Crane system overview

Profiles: Steel roll formed shapes or aluminum extruded shapes used for Tiger Track enclosed track.

Enclosed track: A length of steel or aluminum profile. Enclosed track is used to create runways, bridges, and monorails.

Freestanding System: A freestanding system is a floor mounted system constructed of steel that functions as part of the crane's suspension. The method is used when it is not possible to suspend runways from existing building structure. Composed of the following parts: columns, header beams, sway beams, knee braces.

Ceiling Suspended System: Ceiling suspended systems are suspended directly from an existing building's structure.

Monorail System: A single runway of enclosed track. (No bridge)

Runway: Crane system component that allows the bridge to traverse. It is composed of several sections of enclosed track to achieve a desired runway length. The movement is accomplished by end trucks traveling within the parallel enclosed track runway. It may be supported by a separate freestanding structure or suspended from an existing building's structure.

Articulating Runway: Non rigid suspension coupling which allows slight movement of the runway.

Bridge: Enclosed track that spans between runway. The bridge consists of end trucks which allow the bridge to traverse on the runway.

Articulating Bridge: A non-rigid connection between the bridge and the end trucks allows the bridge to crab (Not remain perpendicular) to the runway.
Semi Fixed Bridge: A semi fixed bridge incorporates a triangle support between two trolley end trucks and the bridge, greatly minimizing the ability of the bridge to crab.

Standard Headroom Single Girder Bridge: Used for standard headroom applications. The bridge is located below the runway.

Standard Headroom Double Girder Bridge: Two bridge tracks with a hoist saddle located between them. Double girder bridges deliver additional structural rigidity that is required when lifting heavier loads.

Low Headroom Single Girder Bridge: Single girder low headroom cranes are designed for applications with limited headroom to obtain maximum available lifting height. The bridge is raised between the runway to optimize the lift height.

Low Headroom Double Girder Bridge: Two bridge tracks with a hoist saddle located between them. Low head room double girder is designed for applications with limited headroom to obtain maximum available lifting height.

Trolley: Serves as a mounting point for the hoist on the bridge as well as allow for the traversing of a hoist on a Bridge or Monorail. They also operate as an end truck for bridge movements on runways.

Double Trolley: Two trolleys connected by a bogie girder, to allow increased capacity as needed.
Double Girder Trolley: Trolley that spans across both bridges on a double girder
End Truck: A single trolley or double trolley positioned at each end of a bridge allowing a bridge to traverse inside a runway.
Bogie Girder: Used to connect two trolleys and increase the load capacity as needed.
Spacer Trolley: Used to separate; provide distance between two bridges on the same runway of a crane, or two trolleys on a Monorail.
Internal Conductor Electrification (ICE): The internal conductor electrification installed inside the profile powers the system via internal conductors and is safe from external exposures and it gives the system a sophisticated look without any hanging cables.

Flat Cable Power Supply: Festooning method of power supply utilizing loops of cable suspended by small trolleys within the enclosed track runway and bridge.

Track Clamp: Component parts that attach to the enclosed track in conjunction with the suspension coupling. This enables the connection of runways to freestanding or suspended systems.

I-Beam Bracket: Used to attach a runway or monorail to an I-beam structure.

Ceiling Mount: Suspension mount intended for use when mounting the suspended system to a supporting structure via chemical anchoring bolts. (For example: connecting a suspended system to a concrete ceiling.)

Angle Brace: When the length of the vertical suspension exceeds 500mm, the runway or monorail must include an angle brace or angle braces.

Threaded Rod: Threaded rod is used with extended suspension coupling when additional length is essential to reach the mounting surface.

End Plates: Closes end of runways and bridge enclosed track.

Standard Suspension Coupling: The standard suspension coupling joins the track clamp and the I beam bracket together.

Extended Suspension Coupling: Used when the distance between the runway and the supporting structure must be longer than standard suspension distance allows.

Inclined I-Beam Mount: Used when the supporting structure for a suspended crane requires attachment to I-beams that are on an incline and not completely horizontal.

L- Bracket Mount: Used when connecting to the side of supporting structure.

Side Mount: Used specifically when the supporting structure is constructed from laminated wood beams or concrete.

Heavy Duty Suspension: Used when loads exceed the capability of standard suspensions.

Binding Bolt: Used in combination with S260 enclosed track only; provides additional rigidity under heavy loads.

Junction Box: Used on end of runway to connect incoming power to the runway. Used on each bridge to connect power from runway to bridge.

Collector: Provide electrical contact points for end trucks and trolleys when the system is equipped with internal conductor electrification.

Collector Retainer: Allows the collector to maintain its position on top of trolley.

Connection Joint: Connection points of two sections of enclosed track.

Joint Hardware: Hardware used at each connection joint. Used for steel runways only.

Joint Plates: Plates and hardware used at each connection joint of aluminum enclosed track. Used for aluminum runway only.

Cable Trolley: Designed specifically to carry flat cable festooning on the enclosed track runway and bridge.

Tow Cable: Relieves the flat cable of stresses and tensions at the connection point of the hoist during the hoist/trolley's movement on the bridge.

3.0 Crane Installation

3.1 Step One: Preparation for Crane Installation

Delivery and Storage Before Installation

Upon delivery of the crane system:

- Check the contents of the crane system upon delivery and verify that all parts from the packing list are included.
- If there is any shipping damage to the crane components, contact Harrington Hoists, Inc. prior to installation of the crane system.

⚠ WARNING DO NOT INSTALL DAMAGED COMPONENTS

Storage and transportation of the crane components prior to installation:

- Before installing the light crane system, keep the crane components in a dry and dust-free indoor environment between 40 and 105°F (5 and 40°C). Avoid exposure of the components to direct sunlight.
- Light crane components may be transported and handled via truck or forklift.

⚠ WARNING DO NOT STORE CRANE COMPONENTS OUTDOORS

Installation site suitability and site preparation:

Installation must be carried out by competent and authorized personnel.

⚠ WARNING INCORRECT INSTALLATION MAY RESULT IN SERIOUS OR FATAL INJURY

When planning the installation, it is important to consider the following:

- The capacity of supporting structures
- The capacity and construction of the floor
- Applicable safety requirements and regulations
- Dimensional requirements of the specific workstation crane system

Harrington Hoists Inc. is not responsible for evaluating the adequacy of the installation site.

⚠ CAUTION Survey the span, runway length, and locations of suspension points of the crane. Check for any obstacles that may interfere with the installation.

⚠ CAUTION Assemble the components on floor level as much as possible. It makes the installation easier.

General Preparation Work

Before installation of your crane system, some preparatory work is required. This involves inspecting the crane components and verifying that the necessary components are on hand. The installation site must be confirmed to be suitable for the crane installation. In the case of a freestanding light crane system, the framework for the crane must be constructed before the runway and bridge may be installed.

⚠ WARNING Before installing any ceiling suspended system, consult a structural engineer or qualified person to evaluate the supporting structure of the building to determine the suspension mount points and configurations needed. Failure to do so could result in serious injury, death or property damage.

Consult with a qualified structural engineer to determine if your support structure is adequate to support the loads generated by anchor bolt force, overturning moment, or axial load of your crane.

3.2 Freestanding Frame Installation

If the crane is the freestanding type, the freestanding frame structure must be constructed before the crane components can be installed.

Preparation of Vertical Column Bases

1. Select the layout and the locations of your freestanding system's column bases using the supplied drawings for your specific system.
2. For ease of installation, use a template representing the vertical column baseplate to mark floor for drilling anchor bolt hole locations.
3. Chemical Anchor Bolts must be used to secure all columns. (HILTI HIT HY 200 or equivalent is required). Allow epoxy to fully set prior to column installation. Refer to Anchor Bolt manufacture installation instructions for epoxy set time.

Erecting Vertical Columns

1. Install a leveling nut on each anchor bolt prior to column installation. These leveling nuts will be located under each base plate of the vertical columns. Leveling nuts will be utilized later to ensure freestanding system frame is plumb and level. Place all four leveling nuts at similar starting heights to make leveling of the column simpler. (**See Figure 3-2 and 3-3**)
2. Erect vertical columns into position using heavy lifting equipment such as forklift, extension boom, scissor lift, man lift, etc. Use lifting equipment to elevate the column up into its vertical position.
3. Install a leveling nut on each anchor bolt. These leveling nuts will be located on

top of the base plate of the vertical column. Leveling nuts will be utilized later to ensure freestanding system frame is plumb and level. Place all four leveling nuts at similar starting heights to make leveling of the column simpler. (**See Figure 3-2 and 3-3**)

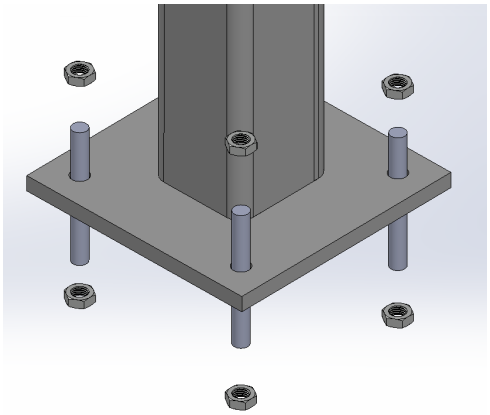


Figure 3-2 Anchor bolt layout

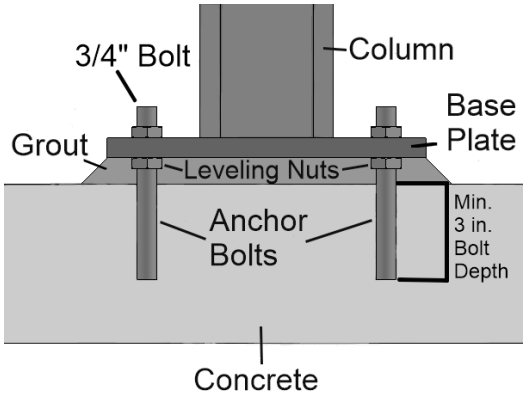


Figure 3-3 Foundation breakdown

Installation of Header Beams

1. With vertical columns erected, proceed with installing the header beams, on top of the vertical columns per the supplied drawings for your specific system. Use lifting equipment to elevate the header beam into position on top of the vertical columns. Use caution not to disturb the previously installed vertical columns. **(See Figure 3-4)**
2. Align all four holes and install hardware (**header beam hardware kit 7221001**), tighten hardware snugly in place. Hardware will be torqued in a later step.

   NOTICE (Insert bolts from the bottom of beam with nut located on top of beam. This provides space for sway beam installation. **(See Figure 3-4 and 3-5)**

Installation of Sway Beams

1. Using lifting equipment, lift sway beam into position and attach to side web shear plate located at top of vertical column. **(See Figure 3-4 and 3-5)**
2. Align both holes in the sway beam with both holes in the sway beam bracket and install hardware (**sway beam hardware kit 7221002**), snugly tighten in place.

   NOTICE Hardware will be torqued in a later step.
3. Confirm sway beams are level before proceeding.

Installation of Knee Braces

1. Bring the knee brace up into position using lifting equipment. Attach the knee braces to the knee brace plates located on the sway beam and vertical column, using the provided hardware (**knee brace hardware kit 7221003**). **(See Figure 3-4)** Take note of the orientation of the braces in comparison to the Knee brace plate below. Refer to your approval drawing for correct placement.
2. Confirm knee brace bolts are secure and snugly tighten in place.

   NOTICE Hardware will be torqued as the final step of freestanding structure installation.

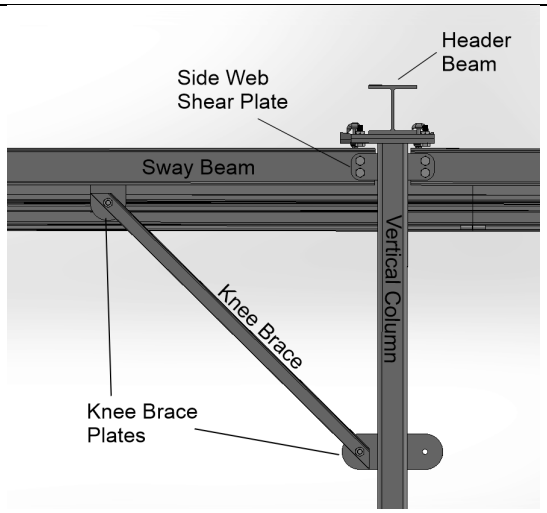


Figure 3-4 Frame components

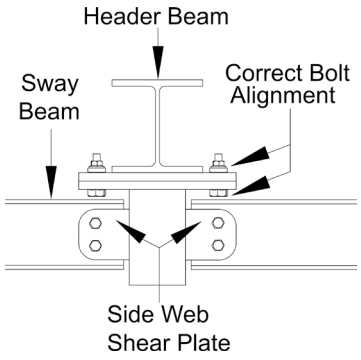


Figure 3-5 Header and sway beam

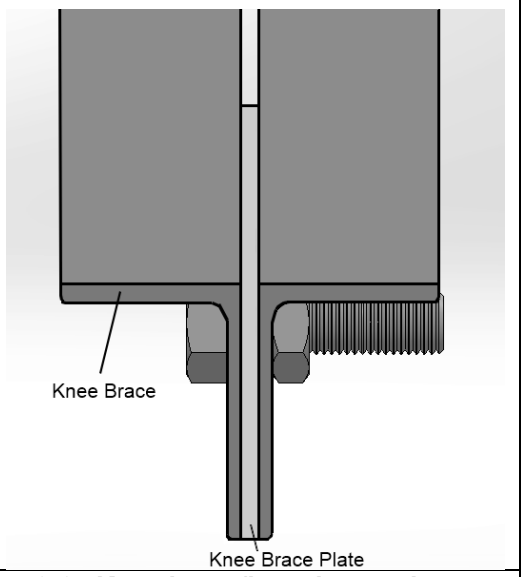


Figure 3-6 Knee brace/knee brace plate

Final torque all members of freestanding structure

⚠ WARNING Ensure leveling nuts and hardware connecting all members of the freestanding structure are torqued to specification prior to proceeding to runway installation.

1. Confirm columns, header beams and sway beams are level and square. Adjust leveling nuts as needed. Torque leveling nuts to manufactures specifications.
2. With freestanding frame level and square, torque all hardware connecting all frame members utilizing the torque range in **Table 3-1**.

Table 3-1 Free standing system torque value	
Hardware Kit Part Number	**Torque Range lbf-ft (Nm)**
7221001 – Header Beam	350 - 425 (474.5 - 576.2)
7221002 – Sway Beam	
7221003 – Knee Brace	

3.3 Runway Installation

In the case of a bridge crane, the runway consists of two parallel tracks “runway” which are connected by the crane bridge or bridges. For monorail systems, there is a singular runway track upon which the hoist trolley or trolleys travel.

⚠ WARNING To prevent the trolley and or end truck from exiting the end of the track, do not operate crane without track endplates properly installed.

3.3.1 Suspension Installation Overview

Crane suspension points are used to support the load of the crane from its supporting structure. Tiger Track workstation crane systems are supported by either a freestanding frame, or the ceiling structure of the building. How the runway track is connected is determined by the type of structure with which it is being connected. Assembly of each type of suspension is detailed in this manual.

Crane suspensions consist of three different components that make up the vertical support assembly. The bottom component is the track clamp that connects directly to the track profile. The middle component connects the track clamp to the top mounting piece and consists either of the standard suspension coupling or extended suspension coupling using varying lengths of threaded rod based on the need for different crane heights. The top component is the suspension bracket or suspension mount that connects the crane to the supporting structure based on the type of structure and connection method required. Section 3.3.3 through 3.3.9 describe these different types of suspension configurations.

Generally, the sequence of installation for runways begins with installation of the vertical suspension components for each piece of runway track, followed by joining the pieces of track from one end of the runway to the other. The installation sequence is described with more detail in section 3.3.13.

3.3.2 Suspension Coupling Types

Between the attachment to the load-bearing structure and the profile there are two types of suspension couplings available, a standard suspension coupling and extended suspension coupling. For free standing structure applications and many ceiling suspended applications the standard suspension coupling will be used. If a ceiling suspended system is being attached to a structure requiring attachment points at various heights, the extended suspension coupling is the solution. The same suspension couplings are used for steel and aluminum enclosed track applications.

NOTICE Suspension couplings are always the same regardless of the steel or aluminum track being used. If the suspension coupling has both a suspension nut and a suspension screw, a suspension nut is always recommended for the attachment of the load-bearing structure.

Standard Suspension Coupling

The standard suspension coupling type is shown in **Figure 3-7**. The design of the standard suspension allows for small height adjustments to properly level the crane runway or monorail.

The standard suspension coupling includes a suspension screw (1.1), a suspension nut (1.2), cotter pin (1.3) and a spherical plain bearing (1.4) **See Figure 3-7.**

NOTICE Always attach the suspension nut to the load-bearing structure side of the suspension coupling.

Slide the spherical plain bearing (1.4) into the suspension nut (1.2) and suspension screw (1.1).

1. Place the suspension nut (1.2) with spherical plain bearing (1.4) into suspension bracket or suspension mount being used to attach to supporting structure. Refer to the suspension section 3.3.3 through section 3.3.8 for suspension nut installation instructions with specific brackets and mounts.
2. When connecting, screw the suspension screw inside the suspension nut approximately halfway through the suspension nut's hole and lock with a cotter pin (1.3).

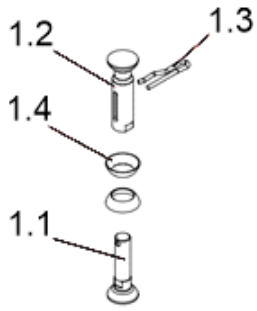


Figure 3-7 Standard suspension coupling

Table 3-2: Standard suspension coupling assembly			
Part Number	**Reference Fig #3-7**	**Quantity**	**Description**
TTE430170		1	Link suspension
	1.1	1	Suspension screw
	1.2	1	Suspension nut
	1.3	1	Spring cotter pin
	1.4	2	Spherical plain bearing

⚠ CAUTION Make sure that the hole in the suspension screw is visible through the slot in the suspension nut. Also, make sure that the spring cotter pin goes through the slot and the hole in the suspension screw, to lock into position.

Extended Suspension Coupling

Extended suspensions are used when the distance between the runway track and the supporting structure must be longer than the standard suspension distance allows.

Extended suspension is used to hang systems between the track clamp and the attachment of the load-bearing structure.

Extended suspension includes a suspension nut (1.2), cotter pin (1.3) and a spherical plain bearing (1.4). The threaded rod (2) between the suspension nuts is ordered separately according to the required length.

1. Slide the spherical plain bearing (1.4) into the suspension nuts (1.2).
2. Place the first suspension nut (1.2) on the fastening.
3. Place the other suspension nut (1.2) in a track clamp.
4. When connecting, screw the threaded rod inside the suspension nuts approximately halfway through the suspension nut's hole and lock with cotter pin (1.3).

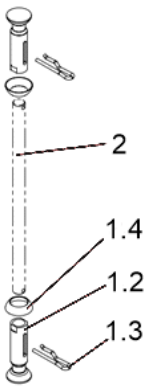


Figure 3-8 Extended suspension coupling

Table 3-3 Extended suspension coupling assembly			
Part Number	**Reference Fig #3-8**	**Quantity**	**Description**
TTE430043		1	Extended suspension with spring cotter pin
	1.2	2	Suspension nut
	1.3	2	Spring cotter pin
	1.4	2	Spherical plain bearing
TTE430161-0100	2	1	Threaded Rod M16 x 1.5mm (L=100 mm)
TTE430161-0300			Threaded Rod M16 x 1.5mm (L=300 mm)
TTE430161-0600			Threaded Rod M16 x 1.5mm (L=600 mm0
TTE430161-1000			Threaded Rod M16 x 1.5mm (L=1000 mm)

⚠ CAUTION Make sure that the hole in the suspension threaded rod is visible through the slot in the suspension nut. Also, make sure that the spring cotter pin goes through the slot and the hole in the suspension threaded rod.

3.3.3 Track Clamps

Track clamps are the components that attach to the track profile to connect the runway track to the supporting structure of the crane.

Track clamps for S200/S260 steel profiles:

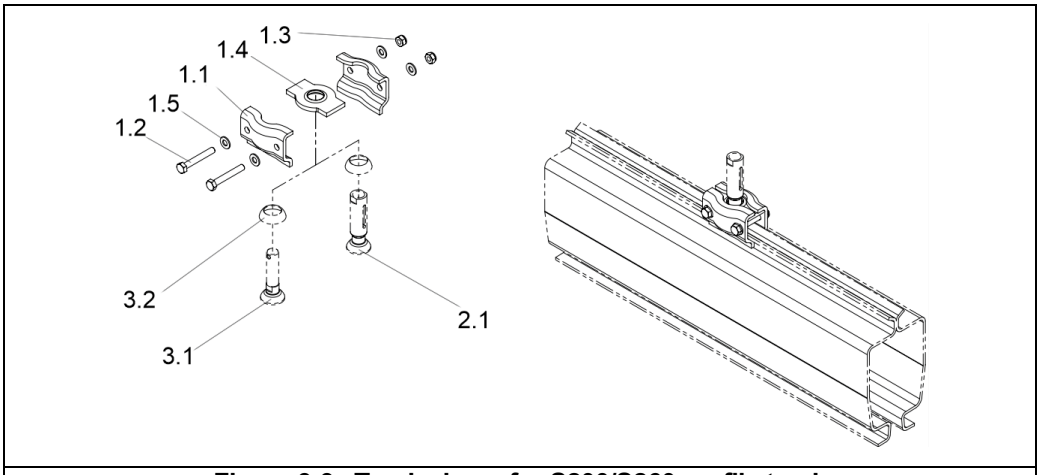


Figure 3-9 Track clamp for S200/S260 profile track

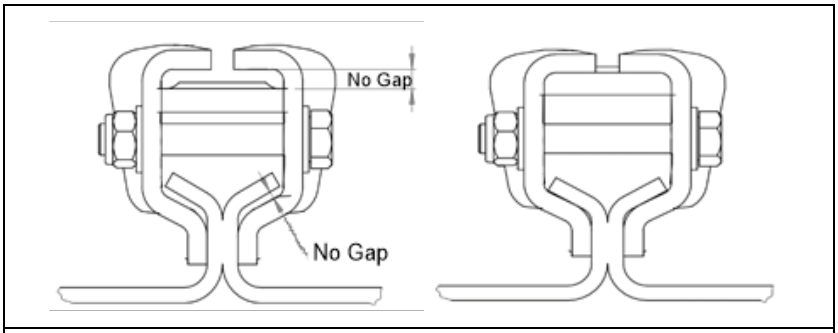


Figure 3-10 Incorrect vs. correct track clamp installation

Installing track clamps to S200/S260 profile (Refer to **Figure 3-9** and **Table 3-4**)

1. Insert the suspension screw (3.1) or the suspension nut (2.1) through the hole in the articulating plate (1.4).
   a. The suspension screw (3.1) is used with standard suspension coupling (**Figure 3-7**)
   b. The Suspension Nut (2.1) is used with extended suspension coupling (**Figure 3-8**)
2. Place the claws (1.1) around the top spine of the steel track profile and place the articulating plate (1.4) inside the claws.
3. Fasten the track clamp claws with bolts (1.2), washers (1.5) and nuts (1.3).

⚠ CAUTION Confirm no gap is between the articulating plate and the top of the track clamp claws, or between the track profile and the lower portion of the track clamp claws (Figure 3-8). If necessary, pull the link part away from the track profile to remove clearances.

4. Do not torque track clamp at this time. Torque to final specification after runway is installed in position.

NOTICE The track clamp will need the ability to slide along the top rib of the track profile to allow for alignment of the Suspension Couplings. Torque hardware after the runway track is installed and leveled. At that time torque hardware to 18.5 lbf-ft (25 N-m).

Table 3-4 Track clamp S200/S260 steel track profile				
Part Number	**Ref # Fig.3-9**	**Quantity**	**Description**	**Torque**
TTE430101	1.1	2	Claw	18.5 lbf-ft (25 Nm)
	1.2	2	Hex head bolt	
	1.3	2	Lock nut	
	1.4	1	Articulating Plate	
	1.5	4	Washer	

Track clamp for aluminum profiles:

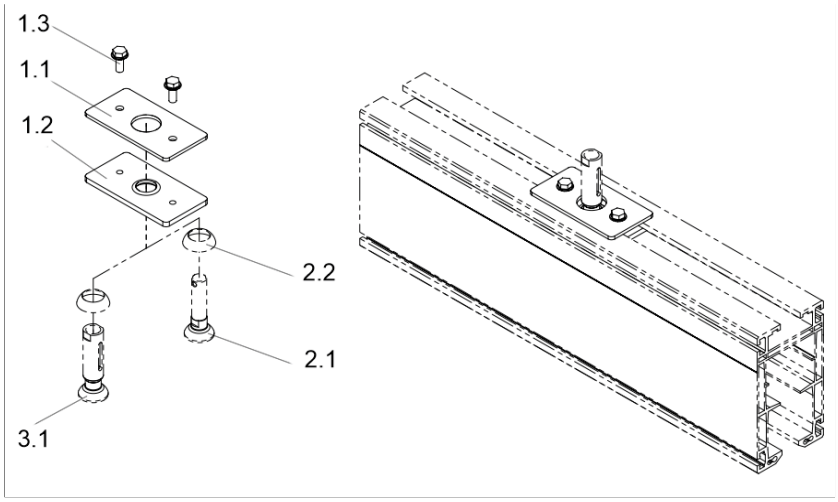


Figure 3-11 Track clamps for aluminum profiles (all sizes)

Installing track clamps for aluminum profile tracks, (Refer to **Figure 3-11** and **Table 3-5**)

1. Insert suspension screw (2.1) with spherical plain bearing (2.2) or suspension nut (3.1) with spherical plain bearing (2.2) through the hole in the bottom plate (1.2).
    a. The suspension screw (2.1) is used with standard suspension coupling (**Figure 3-7**)
    b. The suspension nut (3.1) is used with extended suspension coupling (**Figure 3-8**)
2. Slide top plate (1.1) over the suspension screw (2.1) or suspension nut and loosely install the hexagon head bolts (1.3).
3. Slide the entire track clamp assembly into the top portion of the aluminium track so bottom plate (1.2) is inside the track profile and the top plate (1.1) is on top of the track profile. (**Figure 3-9**)
4. Do not torque track clamps at this time. Torque to final specification after runway is installed in position.

NOTICE The track clamp will need the ability to slide along the track profile to allow for alignment of the suspension couplings. Torque hardware after the runway track is installed and leveled. At that time torque the hexagon head bolt to 7.5 lbf-ft (10 N-m).

Table 3-5 Track clamp for aluminum track profile (all sizes)				
Part Number	**Ref # Fig. 3-9**	**Quantity**	**Description**	**Torque**
TTEEAN17001	1.1	1	Top plate for suspension coupling	7.5 ft. lbs. (10 Nm)
	1.2	1	Bottom plate for suspension couple, M16	
	1.3	2	Hexagon head bolt with serrated flange	

3.3.4 I-Beam Bracket Suspension

The most common type of suspension attachment is the I-beam suspension. The I-beam suspension is used on freestanding workstation crane systems, and ceiling-suspended workstation crane systems that are supported by I-beams in the structure of the building.

There are three sizes of I-beam brackets for use with different ranges of beam flange widths.

Table 3-6 I-Beam brackets for different beam flange widths		
Part Number	**Description**	**Beam Flange Width Range**
TTE430023	I-Beam Bracket A	2.75-5.1 in. (70-130mm)
TTE430024	I-Beam Bracket B	3.5-7.8 in. (90-200mm)
TTE430028	I-Beam Bracket C	7.8-11.8 in. (200-300mm)

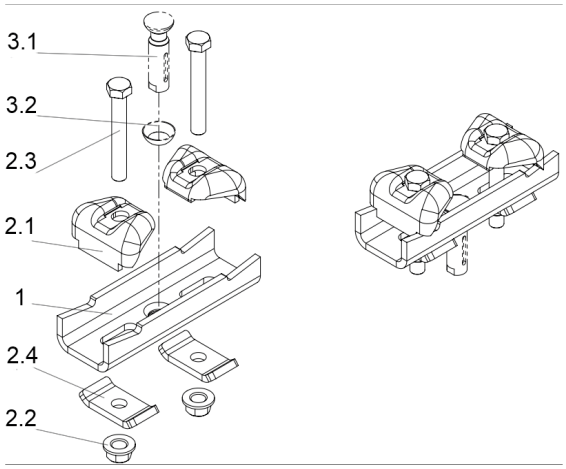


Figure 3-12 I-Beam bracket suspension

Installing the I-beam bracket suspension (Refer to **Figure 3-12** and **Table 3-7**),

1. Place the clamping claws (2.1) on the mounting plate (1).
2. Thread the bolts (2.3) through the claws and the mounting plate (1).
3. Slide the washers (2.4) on the bolts (2.3) so the washers are located under the mounting plate (1). and lock with the nut (2.2).
3. Thread the nut (2.2) on each bolt (2.3), but do not fully tighten.
4. Insert the suspension joint nut (3.1) with spherical plain bearing (3.2) into the center hole in the mounting plate (1).
5. With the hardware loosely attached, position the complete I Beam Bracket onto the beam.
6. Slide the claws inward until the bolts contact the beam flange. Ensure the mounting plate (1) is against the I beam. See **Figure 3-13**.

6. With the complete I Beam Bracket centered on the beam with the suspension joint nut (3.1) inline with the center of the beam web, ensure there is no interference creating gaps. Torque the bolts to 110 lb-ft (150 Nm).

Table 3-7 I- Beam Bracket (All Sizes)

Part Number	Reference Fig # 3-12	Quantity	Description	Torque lbf-ft (N-m)
TTE430023	1	1	Mounting plate 2.75 – 5.1 in. (70-130mm)	110.6 (150)
TTE430024		1	Mounting plate 3.5 – 7.8 in. (90-200mm)	
TTE430028		1	Mounting plate 7.8 – 11.8 in. (200-300mm)	
TTE430037	2.1	1	Clamping claws	
	2.2	2	Hex flange nut, serrated	
	2.3	2	Hexagon head bolt	
	2.4	2	Plate washer	
TTE430170 or TTE430043	3.1	1	Standard suspension coupling w/ spring cotter pin or extended suspension coupling w/ spring cotter pin	

⚠ WARNING The articulation (runway track suspension point) must be in the center line of the mounting beam. There must be no gap between the bolts (2.3) and I-beam. (See **Figure 3-11**)

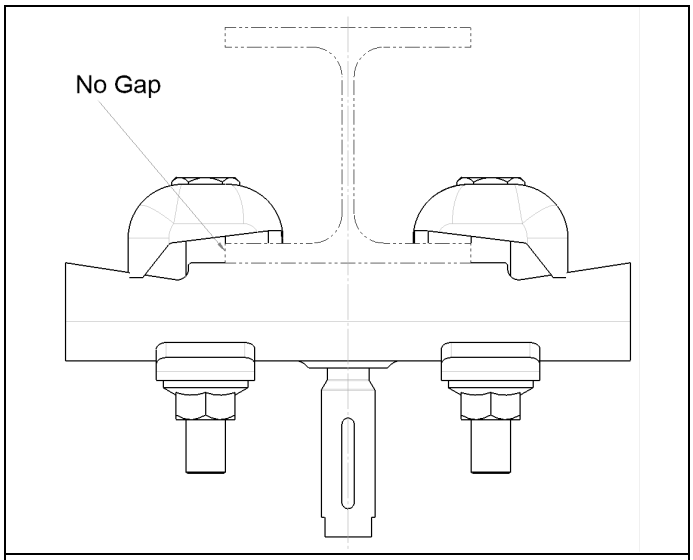


Figure 3-13 Correct Installation of the I-Beam Bracket

NOTICE If installing runway onto a freestanding structure, or if only I-beam brackets are being used as suspension mounting points, proceed to **Section 3.3.12** Track Stopper Bolts and Binding Bolts, followed by **Section 3.3.13** Runway Track Installation Sequence.

3.3.5 Flat roof suspension – through bolt attachment

This type of suspension is intended to be used when a ceiling-supported crane is mounted to the structure via through bolts. For suspensions that use a through bolt attachment type, the mounting plate is used as a mount to the ceiling structure. The clamping claws that are usually needed to attach to an I-beam are not used for this application.

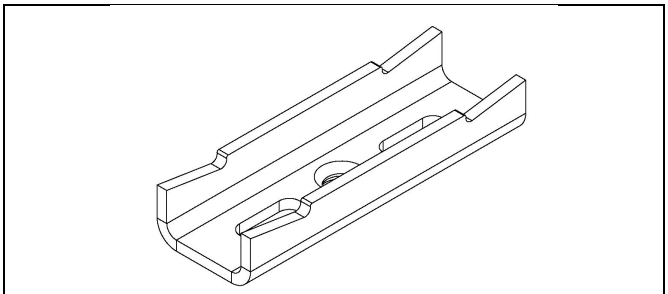


Figure 3-14 Mounting plate used as ceiling mount

3.3.6 Ceiling Mount – Chemical Anchoring

This type of suspension mount is intended for use when mounting the crane to a supporting structure via chemical anchoring bolts.

NOTICE Hardware to connect to supporting structure not included. Consult a structural engineer or qualified person to evaluate your supporting structure and specify the mounting hardware for your application.

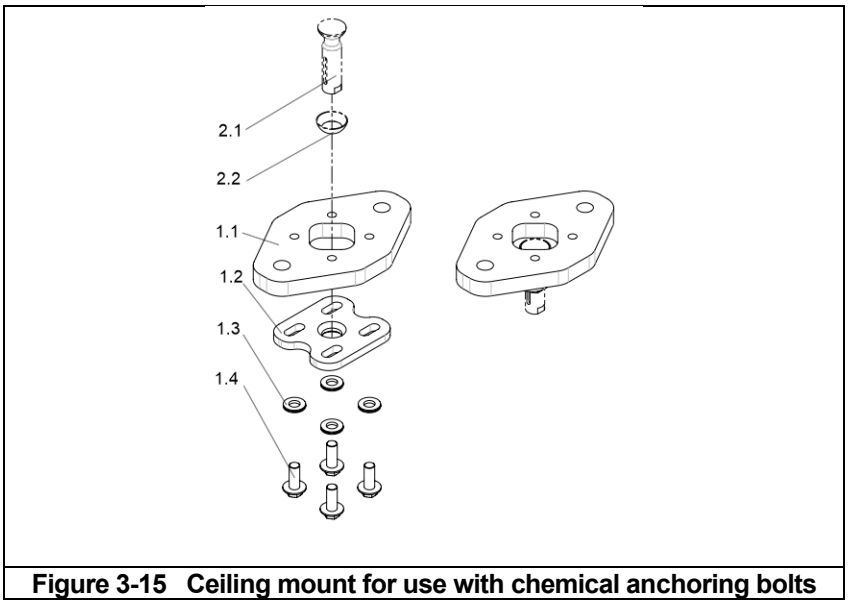


Figure 3-15 Ceiling mount for use with chemical anchoring bolts

Table 3-8 Flat Roof Suspension				
Part Number	**Reference Fig #3-13**	**Quantity**	**Description**	**Torque lbf-ft (N-m)**
TTE430125		1	I Beam bracket adjustable	70 (95)
	1.1	1	Base plate 20x240x150	
	1.2	1	Connecting plate	
	1.3	4	Nord lock washer, Large	
	1.4	4	Hexagon flange screw	

Refer to **Figure 3-15** and **Table 3-8**.

1. Slide the suspension joint nut (2.1) with spherical plain bearing (2.2) into the hole of the connecting plate (1.2).
2. Assemble the Ceiling Mount by attaching the connecting plate (1.2) to the base plate (1.1) with screws (1.4) and torque to 70 lbf-ft (95 N-m).
3. Measure and mark the location of the ceiling plate on the ceiling.

Attach to the ceiling using two anchors, tighten/torque anchors according to the anchor manufacturer's instructions.

3.3.7 L-Bracket Mount

This type of suspension mount is intended for use when mounting a suspended crane to the side of a steel or concrete supporting structure.

NOTICE Hardware to connect to supporting structure not included. Consult a structural engineer or qualified person to evaluate your supporting structure and specify the mounting hardware for your application.

Figure 3-16 L-bracket mount

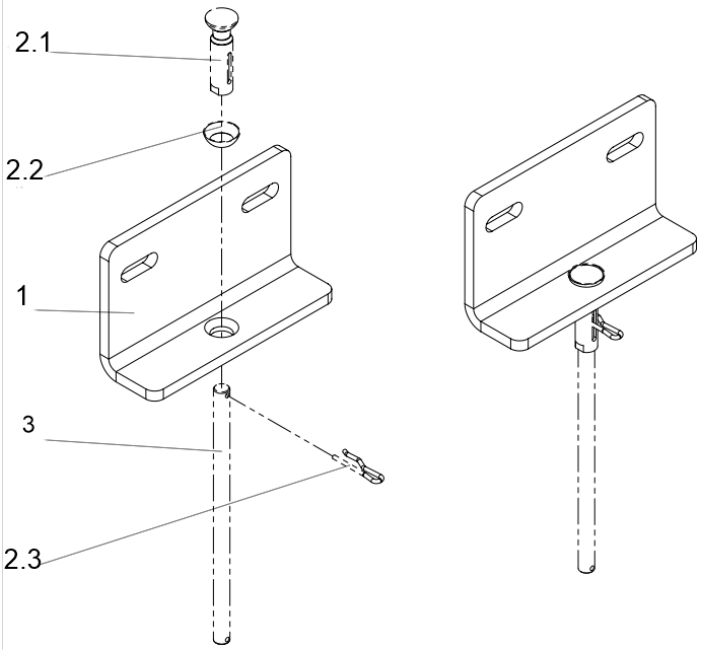


Figure 3-17 L-bracket mount

Table 3-9 L-Bracket				
Part Number	**Reference Fig #3-17**	**Quantity**	**Description**	**Torque lbf-ft (N-m)**
TTE430187	1	1	L-Bracket	Customer responsible for hardware

1. Measure and mark the location of an L-bracket mount.
2. Fasten the L-bracket suspension with two anchors according to the hardware manufacturer's instructions.

3.3.8 Side Mount

This type of suspension mount is intended for suspended cranes specifically when the supporting structure is made of structural laminated wood beams. This suspension may also be used to mount to the side of the supporting structure in cases where the L-bracket suspension is not appropriate.

NOTICE Hardware to connect to supporting structure not included. Consult a structural engineer or qualified person to evaluate your supporting structure and specify the mounting hardware for your application.

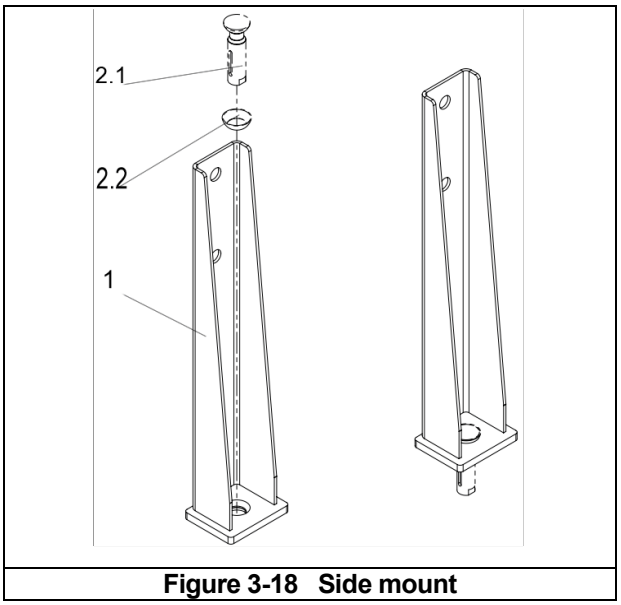


Figure 3-18 Side mount

Table 3-10 Side Mount				
Part Number	**Reference Fig #3-18**	**Quantity**	**Description**	**Torque**
TTE430111	1	1	Side Suspension	Customer responsible for hardware

1. Measure and mark the location of a side mount.
3. Fasten side suspension with two anchors according to the according to the hardware manufacturer's instructions.

NOTICE Hardware to connect to supporting structure not included. Consult a structural engineer or qualified person to evaluate your supporting structure and specify the mounting hardware for your application.

3.3.9 Inclined I-Beam Mount

Inclined I-beam mount is used when the supporting structure for a suspended crane requires attachment to I-beams that are on an incline and not perfectly horizontal.

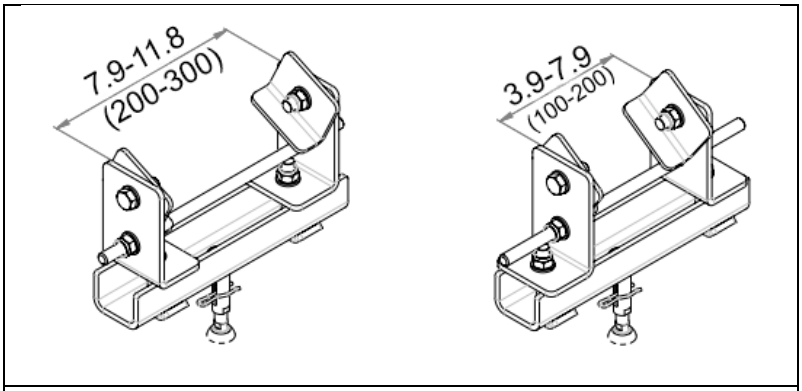


Figure 3-19 Inclined I-beam mount, both adjustment ranges Dimensions in inches (mm)

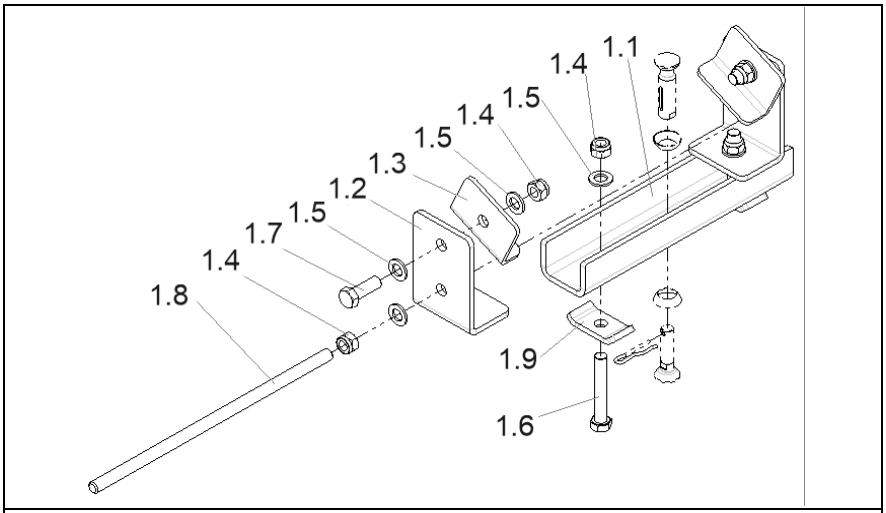


Figure 3-20 Inclined I-beam mount

Refer to **Figure 3-20** and **Table 3-11**.

1. Fasten the support brackets (1.3) to adjustment brackets (1.2) with bolts (1.7), washers (1.5), and locknuts (1.4). Do not torque the bolts at this time.

Note the orientation of the support brackets (1.3) and adjustment brackets (1.2). The two different arrangements allow the Inclined I Beam mount to accommodate a wide range of beam flanges. Arrange accordingly to accommodate the beam flange being used. (**See Figure 3-19**)

2. Place the assembled support bracket (1.3) and adjustment brackets (1.2), on mounting plate (1.1) with the bolts (1.6), plate washers (1.9), washers (1.5) and lock nuts (1.4) in the arrangement shown in (**Figure 3-20**) Do not torque the bolts at this time.
3. Place the joint nut with spherical plain bearing through center hole of mounting plate.
4. Place the mounting plate (1.1)/support brackets (1.3)/adjustment brackets (1.2) assembly on the beam. Slide support brackets to accommodate the beam flange. Confirm the assembly is centered on the beam with the suspension joint nut directly in line with the center of the beam web, ensure there is no interference creating gaps. Tighten hardware.
5. Insert threaded rod (1.8) and install washers and hex nuts (1.4).
6. Torque all hardware to 110 ft-lbs. (150 Nm) securing the assembly to the correct beam flange width.

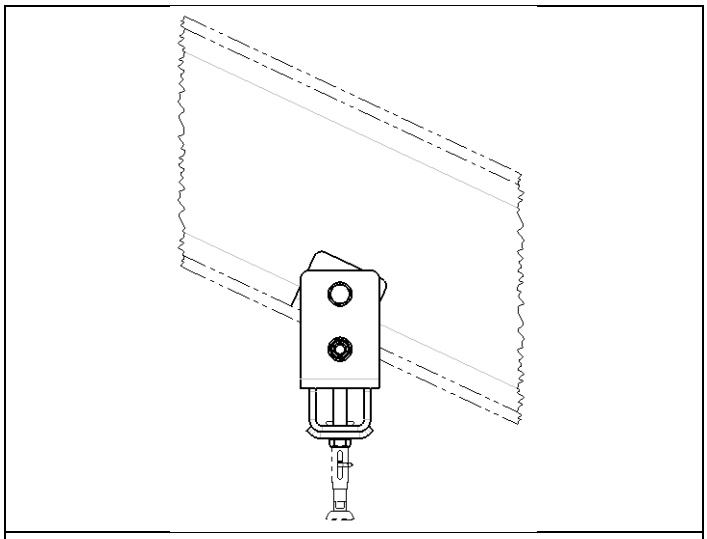


Figure 3-21 Inclined I-beams suspension, side view

6. Confirm the joint nut hangs straight downwards toward the floor (See **Figure 3-19**). Torque support brackets (1.3) to adjustment brackets (1.2)

Table 3-11 Installation of Inclined I beam				
Part Number	**Reference Fig #3-20**	**Quantity**	**Description**	**Torque lbf-ft (N-m)**
TTE430190	1	1	Suspension to Inclined I beam	110.6 (150)
	1.1	1	Ceiling Plate for Inclined suspension	
	1.2	2	Adjustment Bracket	
	1.3	2	Support Bracket	
	1.4	6	Hexagon lock nut	
	1.5	8	Washer	
	1.6	2	Hexagon head bolt	
	1.7	2	Hexagon head bolt	
	1.8	1	Threaded rod	
	1.9	2	Plate washer	

3.3.10 Heavy Duty Suspension

For higher capacities and cranes with suspension location constraints, heavy duty suspensions may be required.

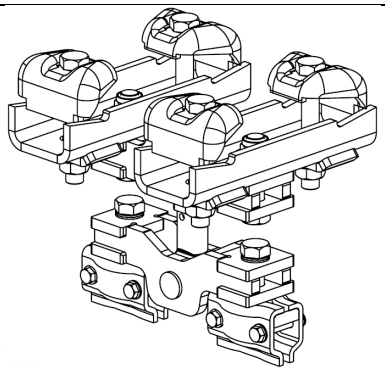


Figure 3-22 Heavy duty suspension

Assembly of heavy duty suspension and extended heavy duty suspension

NOTICE There are two types of heavy duty suspensions. A standard suspension length version refered to as heavy duty suspension and a version designed to accommodate longer suspension lengths refered to as extended heavy duty suspension. The instructions below cover both versions.

Connecting mounting plates with suspension girder (Figure 3-23 and Table 3-12)

Assemble mounting plates (3) and suspension girder (2).

Use washer (2.7) under each locking nut (2.8)

Torque the bolts (2.6) and locking nuts (2.8) to 148 lbf-ft (200 Nm).

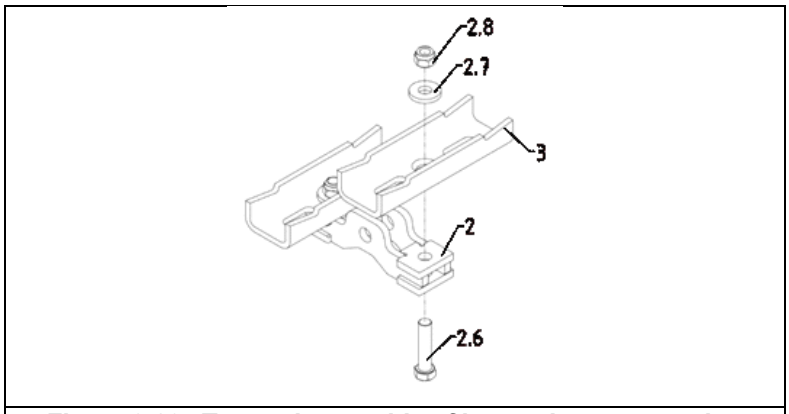


Figure 3-23 Top end assembly of heavy duty suspension

Table 3-12 Mounting of heavy duty suspension				
Part Number	**Reference Fig #3-23**	**Quantity**	**Description**	**Torque lbf-ft (N-m)**
TTE430460	2	1	Suspension girder	147.5 (200)
	2.6	2	Hexagon head bolt	
	2.7	2	Thick flat washer	
	2.8	2	Hexagon lock nut	
TTE430023	3	2	I-Beam Mount for 2.75in.<B<5.1in. 70mm < B ≤ 130mm	
TTE430024	3	2	I-Beam Mount for 5.1in.B<7.8in. 130mm < B ≤ 200mm	
TTE430028	3	2	I-Beam Mount for 7.87in.<B<11.8in. 200mm < B ≤ 300mm	

Attach mounting plates with suspension girder to I-beam (Figure 3-24 and Table 3-13)

1. Place clamping claws (4.2) on mounting plates
2. Install bolts (4.1) through claws, mounting plates and plate washers (4.3).
3. Thread nuts (4.4) on each bolt (4.1), but do not fully tighten.
4. Position the assembly on the beam. Slide clamping claws (4.2) inward until bolt (4.1) contact the beam flange.
5. Confirm no gap is left between the I-girder mount bolts and the beam flange. (**Figure 3-25**)
6. Adjust assembly so that the centerline of the suspension girder is aligned with the beam centerline (**Figure 3-26**).
7. Torque the bolts (4.1) and Nuts (4.3) to 111 lbf-ft (150 N-m).

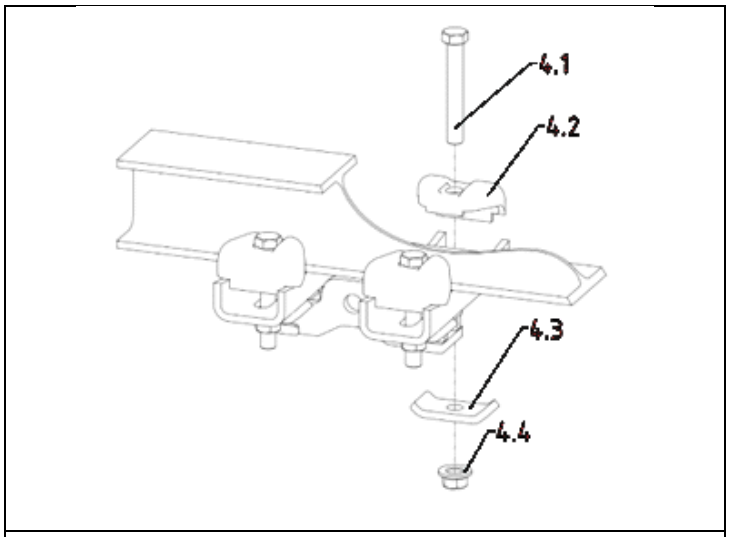


Figure 3-24 Mounting of heavy duty suspension

Table 3-13 Heavy duty suspension				
Part Number	**Reference Fig #3-22**	**Quantity**	**Description**	**Torque lbf-ft (N-m)**
TTE430037	4	4	Clamping claws	110.6 (150)
	4.1	4	Hexagon head bolt	
	4.2	2	I-Beam Mount	
	4.3	4	Plate washer	
	4.4	4	Serrated hexagon flange nut	

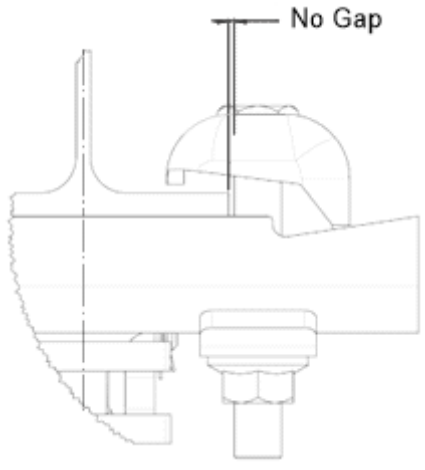


Figure 3-25 No gap is allowed between the bolts and the beam flange

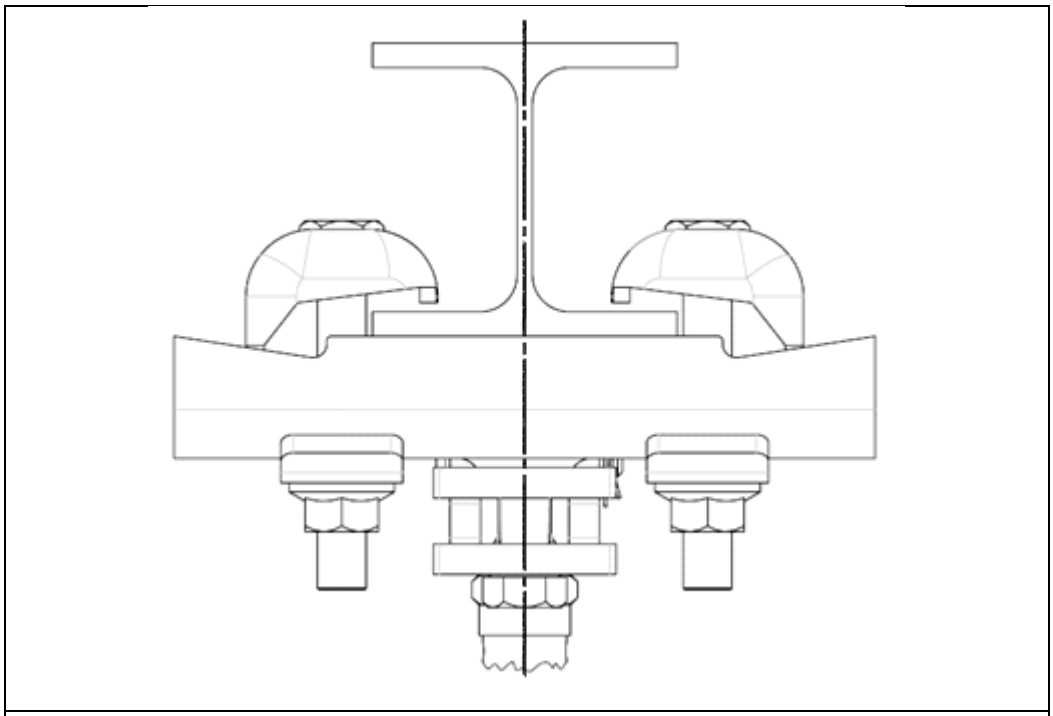


Figure 3-26 The suspension coupling must be aligned with the center of the beam

Installing lower portion of heavy duty suspension

1. Install the male rod end (2.2) for the heavy duty suspension or the female rod end (2.4) if using the extended heavy duty suspension as shown in **Figure 3-27**.
2. Use Load Pin (2.3) for heavy duty suspension or (2.1) for extended heavy duty suspension to suspend rod end from the suspension girder shown in **Figure 3-27**.
3. Install the pin clip (2.4) for heavy duty suspension or (2.2) for extended heavy duty suspension to secure the load pin in place shown in **Figure 3-27**.
4. If using the extended heavy duty suspension, install the threaded rod into the female rod end (2.4) **Figure 3-27**.

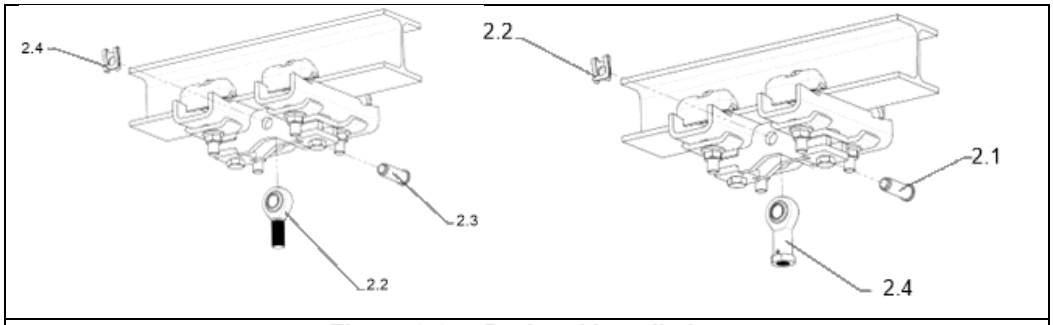


Figure 3-27 Rod end installation

5. Install one hexagon nut heavy duty suspension rod end as shown in **Figure 3-28**. If using extended heavy duty suspension, install two hexagon nuts on the threaded rod as shown in **Figure 3-28**.

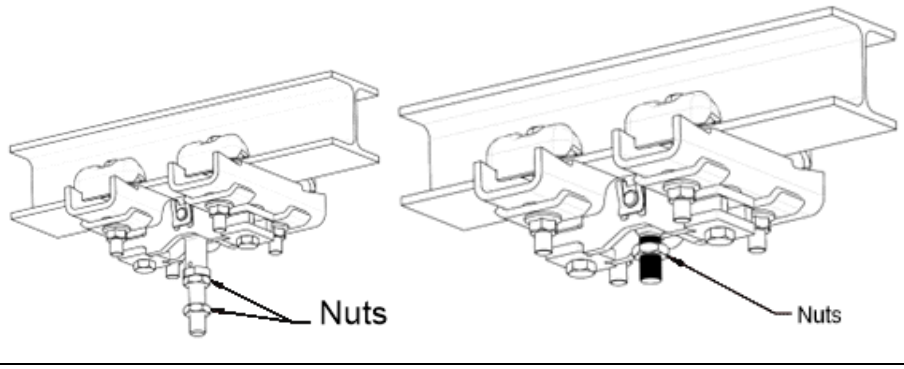


Figure 3-28 Installation of the rod end suspension coupling

6. Install lower rod ends. Ensure that thread is visible through the sight holes in the rod end(s) show in **Figure 3-29**.

⚠ WARNING Thread must be visible in the sight hole of the lower rod end when using heavy duty suspension or both upper and lower rod ends when using the extended heavy duty suspension. If thread is not visible, the rod ends or threaded rod is not screwed in deep enough. Make adjustments if necessary.

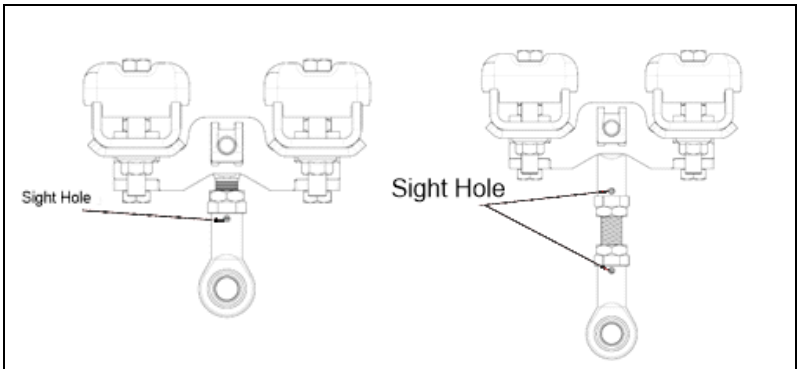


Figure 3-29 Installation of the lower rod end bearing suspension coupling

7. Pre-set rod ends so the height difference between each suspension point is within 0.080 in. (2mm) as shown in **Figure 3-30**.

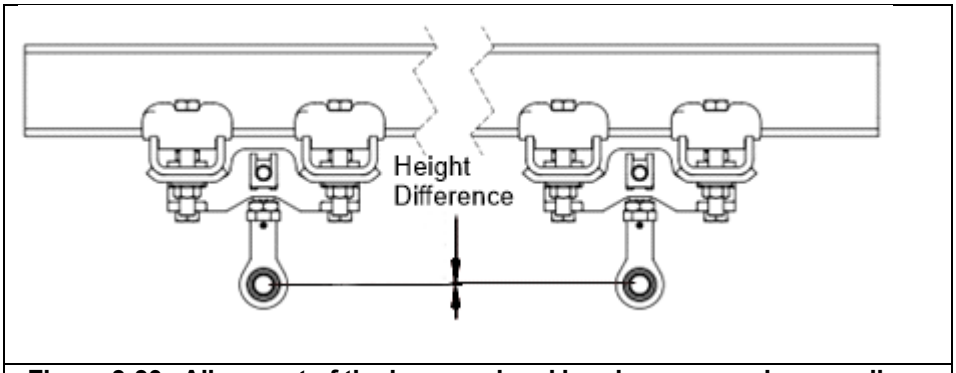


Figure 3-30 Alignment of the lower rod end bearing suspension couplings

8. Lock rod ends or screw bar in its place by tightening the hexagon nut(s) snug as shown in **Figure 3-31**.

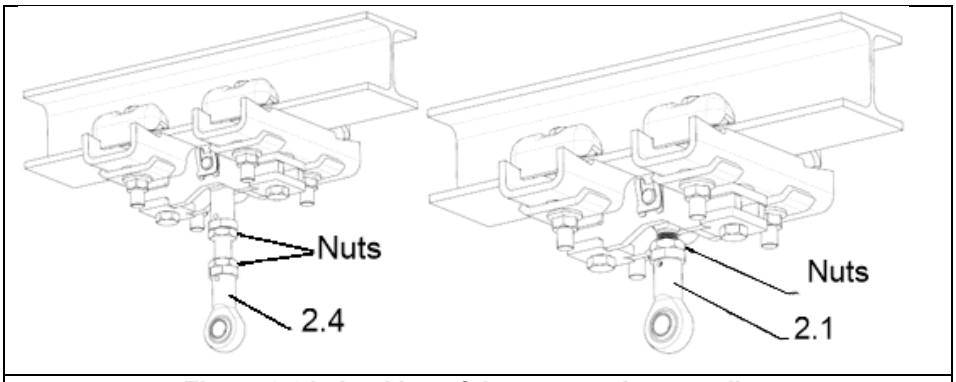


Figure 3-31 Locking of the suspension coupling

8. Assemble track clamps (1) to the track profilewith rectangular nut (2.3) between the two claws (1.1) as shown in **Figure 3 -32**.
9. Torque hardware (1.2), (1.3) to 18.5 lbf-ft (25 N-m) shown in **Table 3-14**.

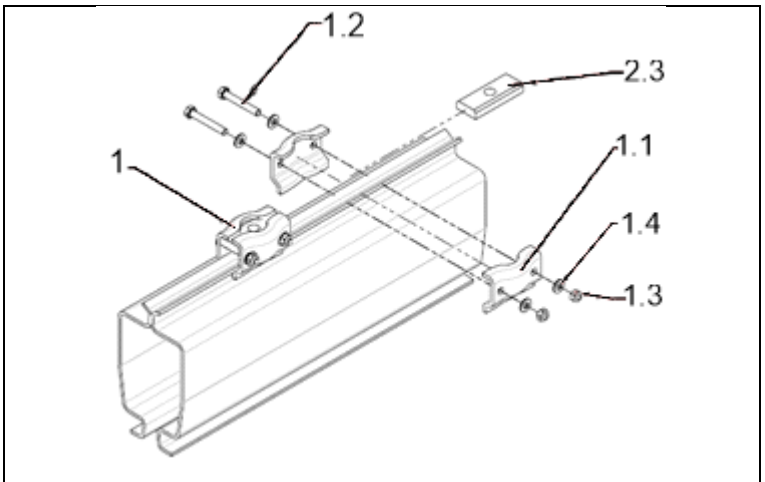


Figure 3-32 Installation of the track clamp

Table 3-14 Track clamp				
Part Number	**Reference Fig #3-32**	**Qty**	**Description**	**Torque lbf-ft (N-m)**
TTE430102		1	Track clamp, without plate	18.5 (25)
	1.1	2	Claw	
	1.2	2	Hexagon head bolt M8	
	1.3	2	Hexagon lock nut M8	
	1.4	4	Washer M8	
	2.3	1	Rectangular nut for track clamp	

⚠ WARNING Ensure track clamps are securely attached to enclosed track. There shall not be gaps between track clamps and mounting surface as well as no gap between the track clamp and rectangular nuts. See **Figure 3-33**.

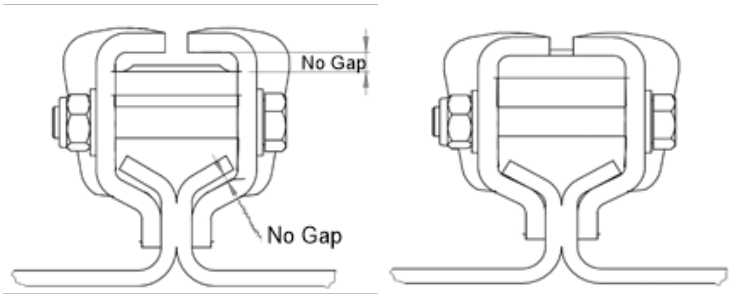


Figure 3-33 Incorrect vs. correct track clamp installation

10. Install suspension girder (1) to the previously assembled track clamps using hex head bolts (2.1) and washers (2.2) as shown in **Figure 3-34**.
11. Torque bolts to 148 lbf-ft (200 N-m).

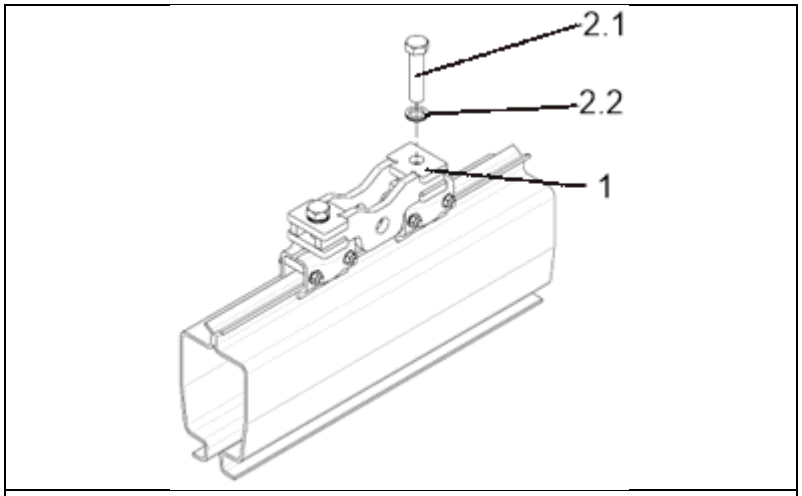


Figure 3-34 Suspension girder installation

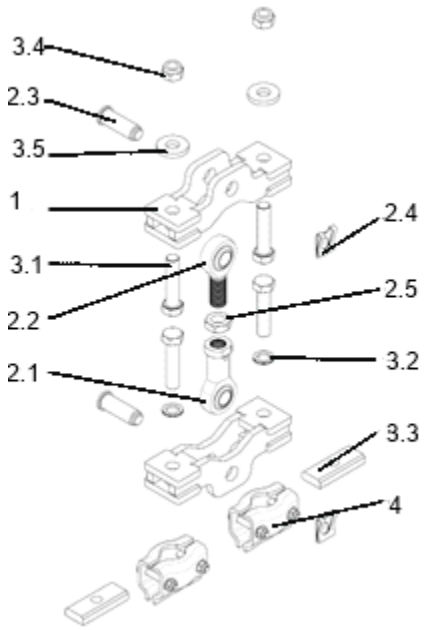


Figure 3-35 Heavy duty suspension assembly

Table 3-15 Installation of track clamp

Part Number	Reference Fig #3-35	Quantity	Description	Torque lbf-ft (N-m)
TTE430460	1	2	Suspension girder	N/A
TTE430601	2	1	Short rod end set	
	2.1	1	Rod end, female with hole	
	2.2	1	Ball joint, male	
	2.3	2	Load shaft	
	2.4	2	Safety catch	
	2.5	1	Hexagon Nut - M20x1.5	
TTE430500	3	1	Articulated double suspension bolt kit	147 (200)
	3.1	4	Hexagon head bolt – M16	
	3.2	2	Nord-lock washer – M16	
	3.3	2	Rectangular nut for track clamp	
	3.4	2	Hexagon lock nut – M16	
	3.5	2	Thick flat washer – M16	
TTE430102	4	2	Track clamp, without plate	22.1 (30)

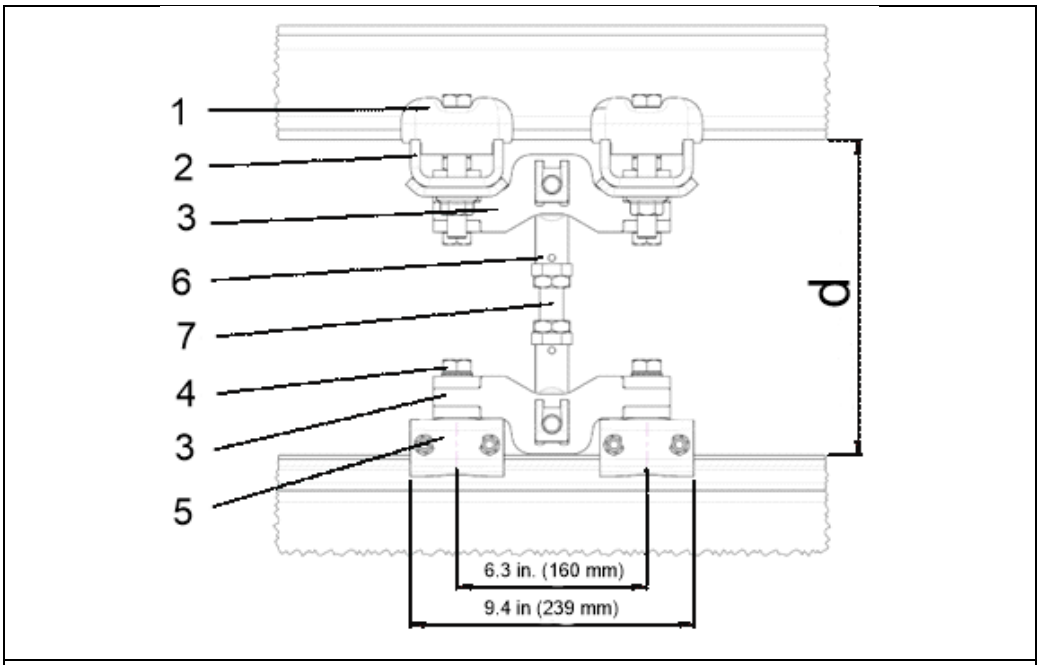


Figure 3-36 Extended heavy duty suspension

Table 3-16 Installation of track clamp

Part Number		Reference Fig #3-36	Quantity	Description	Torque lbf-ft (N-m)
TTE430037		1	2	Clamping claws	111 (150)
TTE430023	for 70 < B ≤ 130	2	2	I-Beam Bracket	N/A
TTE430024	for 130 < B ≤ 200				
TTE430028	for 200 < B ≤ 300				
TTE430460		3	2	Suspension girder	N/A
TTE430500		4	1	Articulated double suspension bolt kit	111 (150)
TTE430102		5	2	Track clamp, without plate	22 (30)
TTE430602		6	1	Distance rod end set	N/A
TTE430163-01	L=100, d= 266	7	1	Threaded Rod	
TTE430163-03	L=300, d= 466				
TTE430163-05	L=500, d= 666				

3.3.11 Angle Braces

When the height of the helical suspension (dimension D in the drawings) exceeds 19.7 in. (500 mm), the track must be supported with an angle brace. Install the diagonal bracket mountings on the hangers before attaching the profile. Angle supports and the angle between the centerline of the suspension should be 35-55 degrees. The angle support mounting must be installed hanging as low as possible.

There must be two angle supports on both lines parallel to the line. On the same side

the angle supports on the track must point in opposite directions.

Additionally, the track must be supported at an angle to the bridge, i.e. perpendicular to the track. In this case, the angle support must include at least two supports for every other suspension, the diagonal supports can be at the same time on a line or on different lines (in the figure below the diagonal supports are on the same line).

The angle support pairs must point in opposite directions.

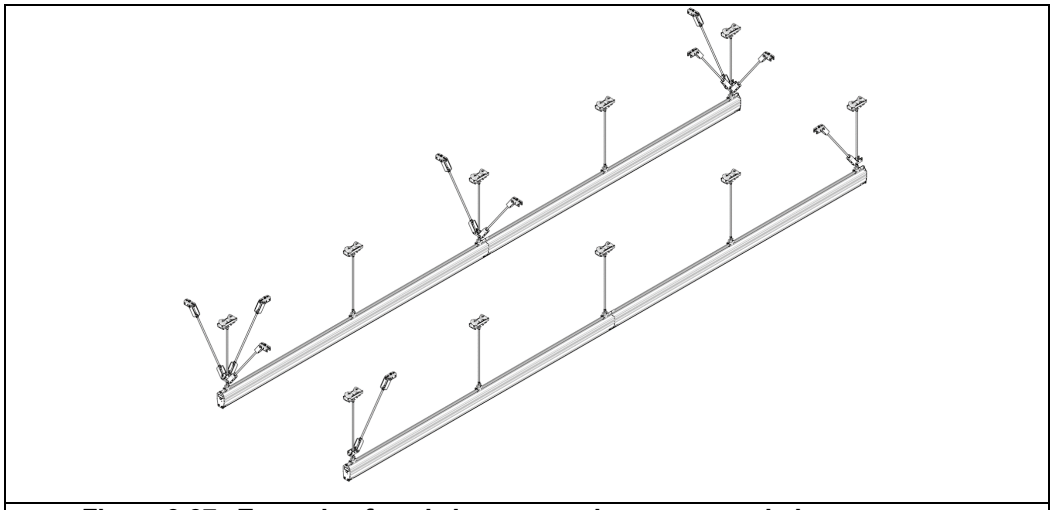


Figure 3-37 Example of angle braces used on a suspended crane runway

Install the angle support bracket (1.1) on the suspension threaded rod and lock in place with the nuts.

The threaded rod (2) is locked to the end piece with nuts and the end piece is connected to the mounting on the shaft (1.4) and on the pin (1.5).

The other end of the angle brace is assembled as described above. Finally, the angle support is attached to the building structures.

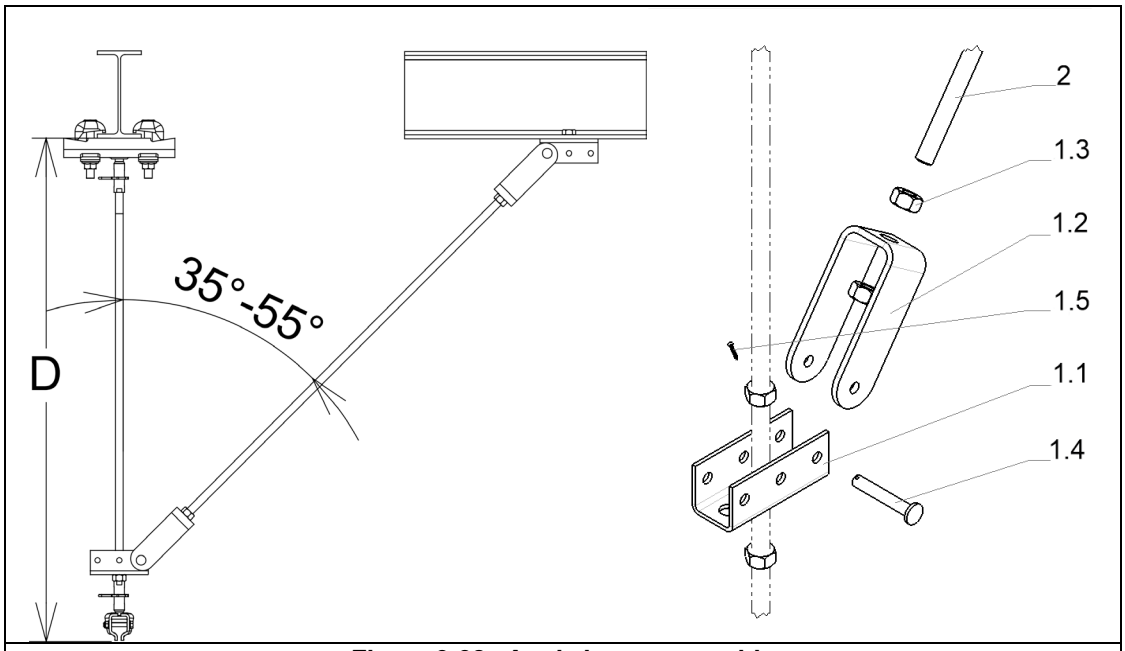


Figure 3-38 Angle brace assembly

Table 3-17: Angle brace assembly			
Part Number	**Reference Fig #3-38**	**Quantity**	**Description**
TTE430153		1	Angle Brace Universal M16*1.5
	1.1	2	Side support mount
	1.2	2	Head of side support
	1.3	8	Hexagon Nut
	1.4	2	Cotter Bolt
	1.5	2	Split Pin
TTE430161-1000	2	1	Threaded Rod M16 x1.5 mm L=1000 mm, with holes
TTE430161-3000			Threaded Rod M16 x1.5 mm L=3000 mm, with holes

3.3.12 Track Stopper Bolts and Binding Bolts

Stopper bolts (Part number TTE420130) may be used to limit bridge or hoist trolley travel along the track, as well as prevent damage to flat cable electrification festoon systems. Holes through the track will be drilled prior to delivery of the crane system.

⚠ WARNING **DO NOT** drill additional holes for installation of stopper bolts. Additional holes may cause damage to the track profile.

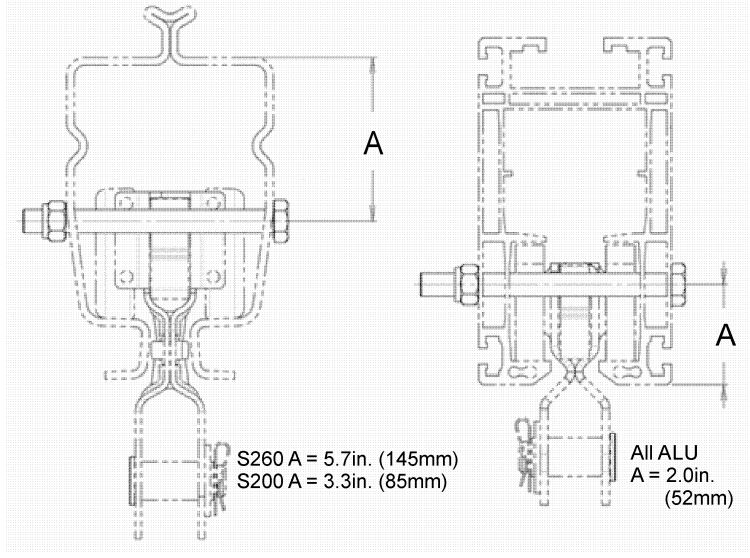


Figure 3-39 Stopper bolt installation location

Stopper bolts must be installed after installation of the end truck trolleys and hoist trolleys. After tightening, it should be almost possible to turn the bolt with your fingers. Do not overtighten the stopper bolts.

Binding bolts (Part number TTE420131) shall be installed in S260 profiles. Binding bolts add additional rigidity to the tall S260 enclosed track. Each length of S260 enclosed track is supplied pre-drilled to accept binding bolts.

- If the crane has a hoist saddle (double girder bridge), it is recommended to install the binding bolts by pushing the bolts in to the profiles from the same side of the hoist saddle.

- Tighten the bolts and avoid compressing the track. After tightening, it should be almost possible to turn the bolt with your fingers. Do not overtighten the binding bolts.
- Make sure the trolley moves smoothly in the profile.

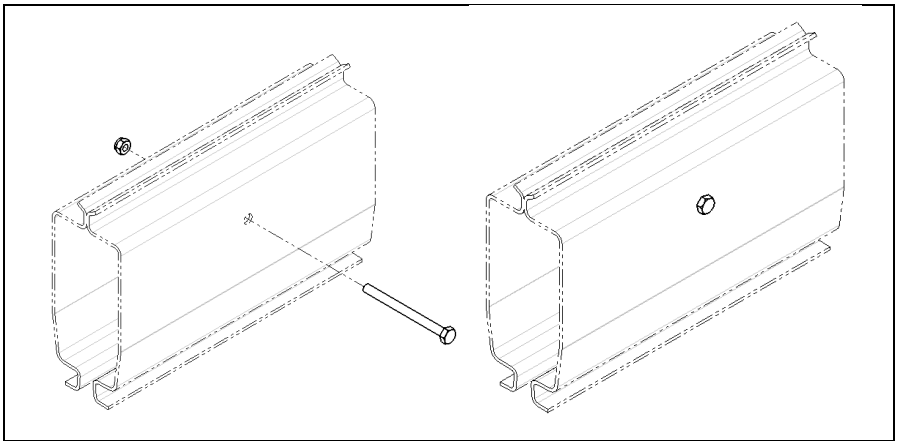


Figure 3-40 Binding bolts for S260 profile

3.3.13 Runway Track Installation Sequence

All track types are installed according to the same instructions and tolerances. Tighten the bolts to indicated torques, see section 3.6.

⚠ WARNING Avoid collisions between lifting equipment (end trucks, man lift, etc.) and the supporting crane structure. Keep fingers and hands clear of any potential pinch points or objects that can slide within the enclosed track, such as trolleys.

1. Lift the profiles up individually and connect the standard or extended suspension couplings to secure them.
    a. Screw the suspension screw of the suspension coupling into the suspension nut so that the hole in the safety pin comes to the middle of the suspension nut's groove.
2. Check the horizontal levelling of the track by using e.g., a laser and a tape measure.
    a. If necessary, adjust the height of the suspension coupling after assembling the whole track.
    b. One turn changes the height by 1/16 in. (1.5 mm).
3. Lock the suspension couplings with pins.

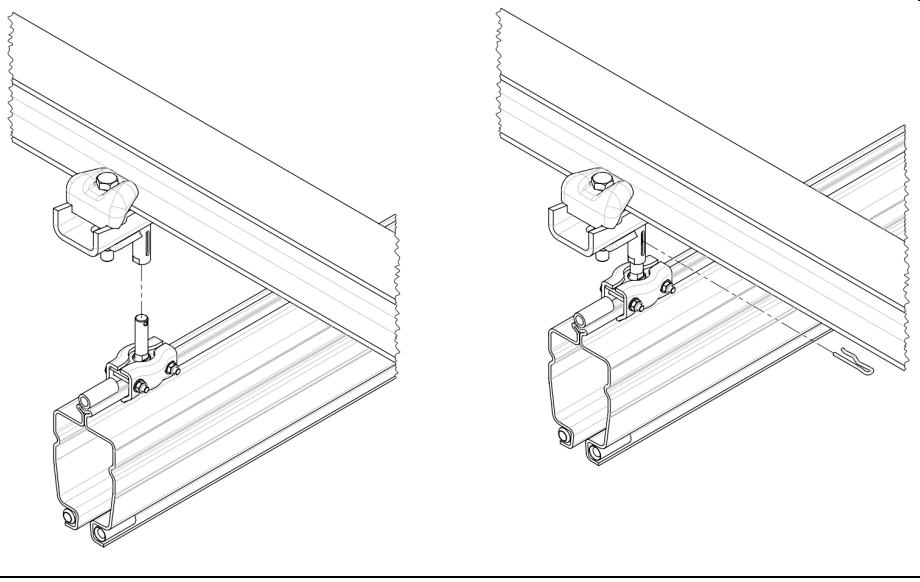


Figure 3-41 Standard link suspension installation

Runway Track Connection Joints

Many segments of track may be attached together to achieve long runway distances. These segments of track must be attached properly to achieve a rigid connection.

Location of connection joints

Consult the crane system drawing to determine the locations of track connection joints relative to suspension locations. This distance is referred to as the "I" dimension.

⚠ WARNING The minimum "I" dimension for all profiles is 4 inches (100mm).

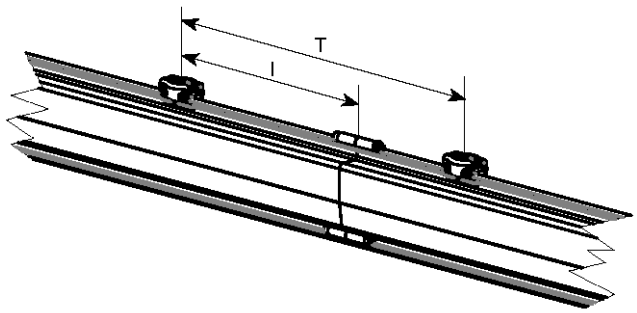


Figure 3-42 "I" distance between track connection joint and suspension location

For steel profile tracks, refer to Figure 3-43,

1. For steel profiles, use joint kit TTE400411.
2. Align the ends of the profiles.
3. Insert the top bolt and screw the nut into the thread by hand at first.
4. Insert the bottom bolts and screw the nuts into the threads by hand.
5. Check that the travel surfaces of the trolleys in the profiles to be connected come to the same level without stepping.

6. Tighten the 2 lowest bolts alternately to correct torque, then tighten the top connection bolt to correct torque.
   - The torque to be used is **18.4 lbf-ft (25Nm).**
7. Check that the travel surfaces of trolleys in the profiles to be connected come to the same level without stepping and that the track line of the profiles to be connected continues in parallel.
   - If necessary, open and tighten the profile connection joints again in different order.

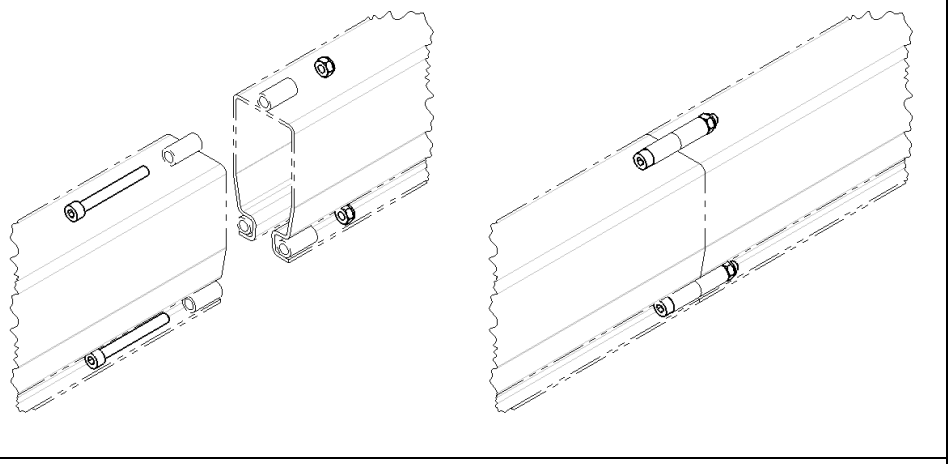


Figure 3-43 Profile connection for steel profile

For Aluminum profile tracks, refer to Figure 3-44,

There are two different profile connection joint sets for aluminium. EAN13001 has a loading capacity of 1100 lbs (500 kg) and an EAN13011 has a loading capacity of 2200 lbs (1 000 kg). Both profile connection joint sets contain parts for one profile connection joint. In the profile connection joint, the profiles are connected with plates entering the grooves in four different places. One profile connection joint contains four identical plate sets (joint parts). Installation procedure in both sets is identical.

1. The parts of the profile connection joint set have been pre-assembled. Loosen the connection bolts to make the sets easier to slide into place.
2. Slide the profile connection joint parts into the grooves on both sides of the profile.
3. Align the ends of the profiles so that there is no gap in the connection point of the profiles.
4. Slide the profile connection joint parts into place so that the centreline of the profile connection joint is at the end surfaces of the profiles.
5. Pre-tighten the bolts, outwards and alternately, from the centre line of the connecting part on both sides, so that the profiles cannot separate from each other.
6. Check that the travel surfaces of trolleys in the profiles to be connected come to the same level without stepping.
7. Tighten all bolts in the profile connection joint to final torque; the tightening order is always outwards from the centre line of the profile connection joint set.

- TTEEAN13001 torque must be **18.4 lbf-ft (25Nm)**
- TTEEAN13011 torque must be **18.4 lbf-ft (25Nm)**

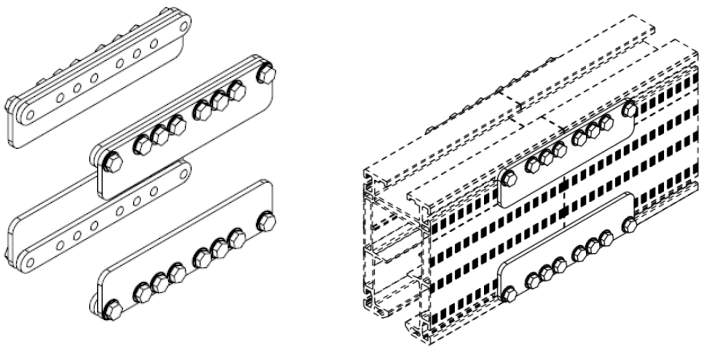


Figure 3-44 Profile connection for aluminum profile

Internal Conductor Electrification Joint Connections

For crane systems that use internal conductor electrification, connections must be made to maintain continuity between sections of enclosed track. This connection instruction is covered in **Section 3.5.1 Internal Conductor Electrification**.

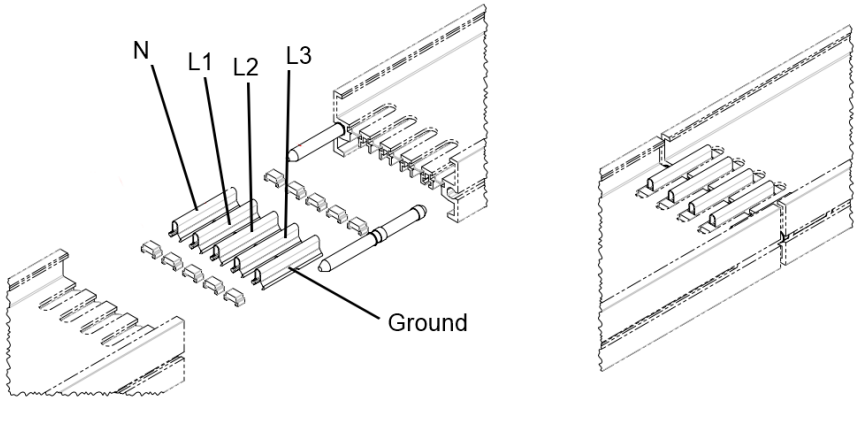


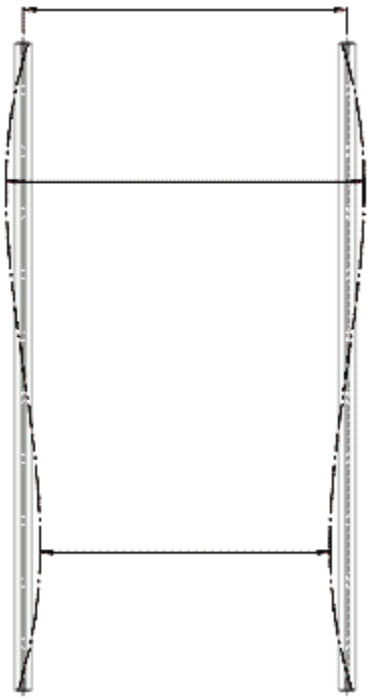
Figure 3-45 Internal conductor electrification joint connection

Height Adjustments

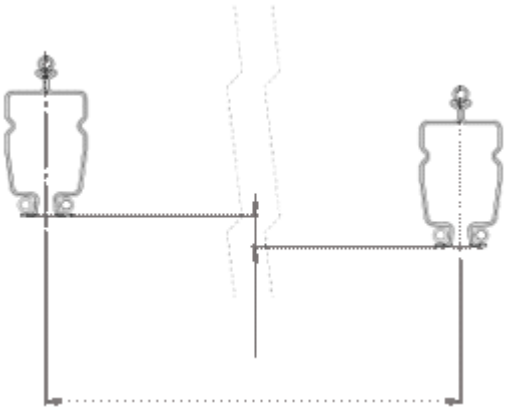
Only original Harrington parts may be used for the assembly of the workstation crane system. The normally intended locking elements may not be replaced by other types of elements. All fittings with threaded bolts must be secured, depending on respective specifications.

The track profiles must be installed so that the profiles are level, trolleys must stay still with and without a load. If a trolley moves by itself, check the installation of the crane and adjust the suspensions if needed so that the trolley stays in place.

⚠ WARNING – A trolley moving by itself without input from the operator may result in significant material damage and serious or fatal injury. Verify that a trolley does not move by itself with a load and without a load.



The span must be constant along the entire length of the runway. The tolerance for range of span is 0.4 inches (10 mm).



The maximum height difference between both sides of the runway track is 0.4 inches (10 mm) and/or 0.002 x Span.

The actual height of the track must be within 0.4 inches (10 mm) from the desired height.

Figure 3-46 Maximum height differences

End Truck Trolleys

Bogie Girders (Double Trolley)

If the nominal load exceeds the load capacity of one trolley, connecting two trolleys together with a bogie girder increases capacity and reduce the horizontal force required to move the load.

The TTE440216S is recommended to be installed with the grooves pointing upwards. See **Figure 3-47** and **3-48.**

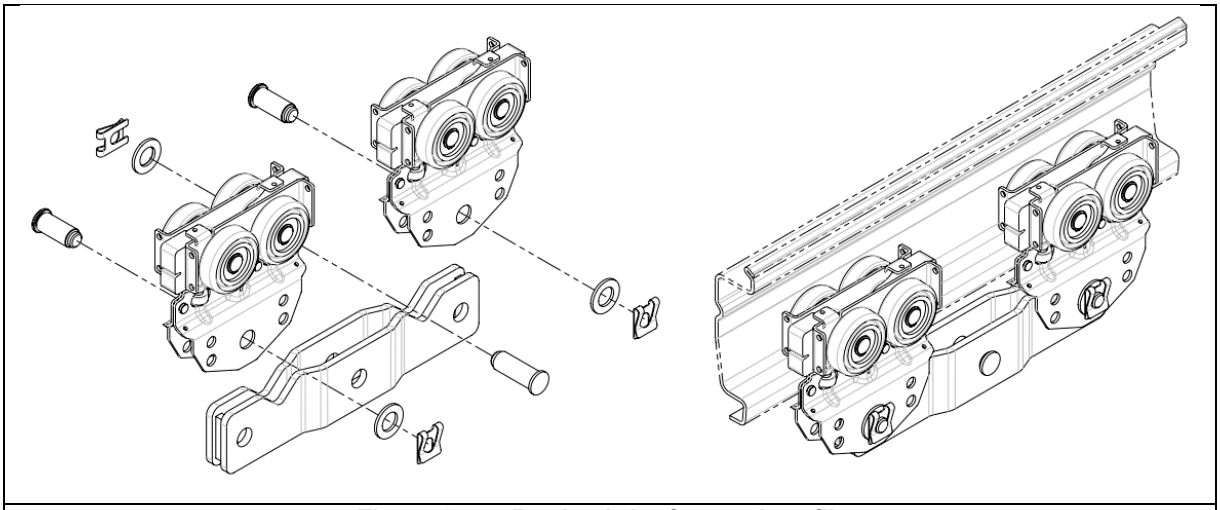


Figure 3-47 Bogie girder for steel profiles

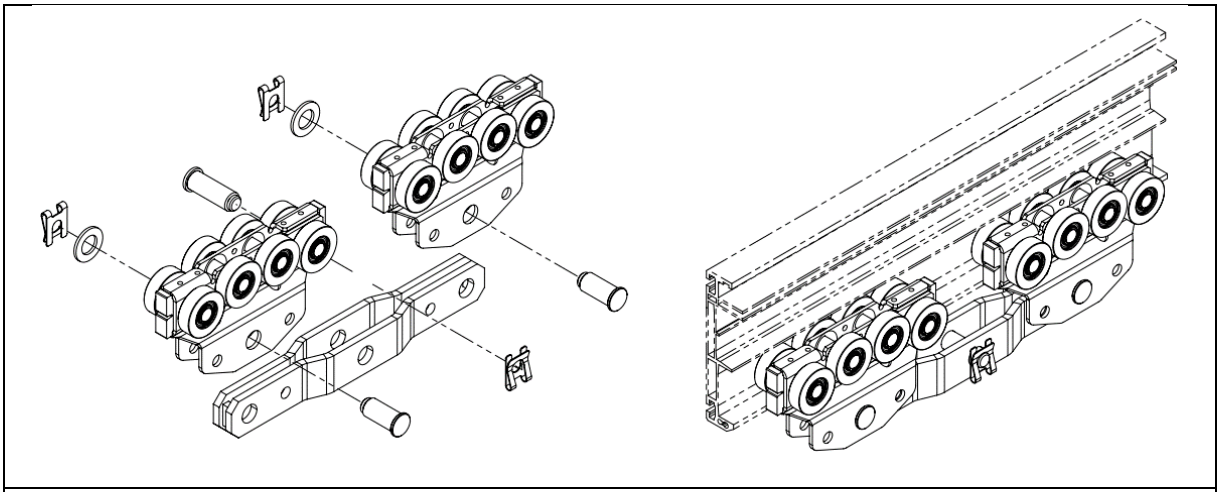


Figure 3-48 Bogie girder for aluminum profiles

Spacer Trolleys

The purpose of a distance trolley is to separate two bridges on the same track to prevent collisions of hoists and to adjust possible suspension distances. A spacer trolley is installed on each side of the runway track to keep bridges separated. A spacer trolley may also be used to separate multiple hoists on the same bridge or track. See **Figure 3-49** and **3-50**.

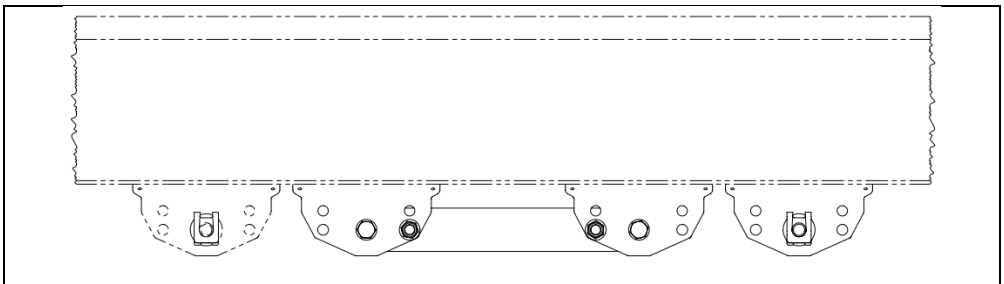


Figure 3-49 Example of a spacer trolley

Spacer trolley for steel profiles

The spacer trolley for steel profiles consists of two products: “Distance trolley set without tube” and “Distance trolley tube”. The distance trolley tubes are available in different lengths. The tube is connected to the half trolleys with bolts. See **Figure 3-50** and **Table 3-18**.

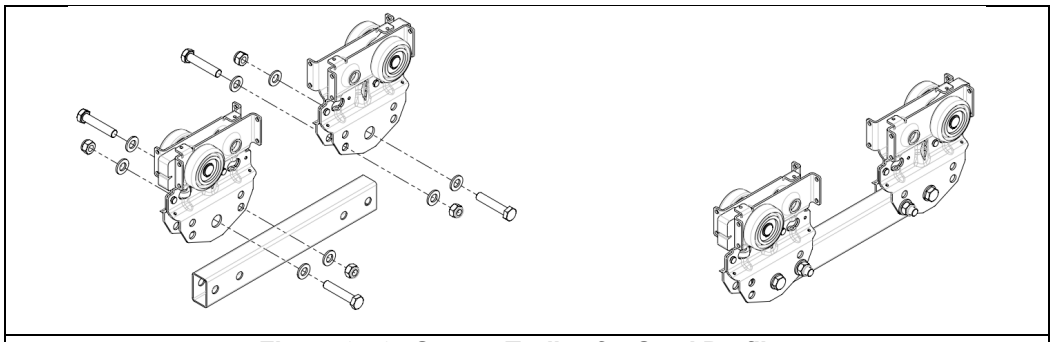


Figure 3-50 Spacer Trolley for Steel Profiles

Table 3-18 Spacer Trolley Lengths

Part Number	Description	Part Number	Description	Total Length in. (mm)
TTE440122	Distance trolley set without tube	TTE440123-0350	Distance trolley tube 500 (L=13.7in.(350mm))	19.7 (500)
TTE440122	Distance trolley set without tube	TTE440123-0850	Distance trolley tube 1000 (L=33.5in.(850mm))	39.4 (1000)
TTE440122	Distance trolley set without tube	TTE440123-1350	Distance trolley tube 1500 (L=53.2in.(1350mm))	59 (1500)
TTE440122	Distance trolley set without tube	TTE440123-1850	Distance trolley tube 2000 (L=72.8in.(1850mm))	78.4 (2000)
TTE440122	Distance trolley set without tube	TTE440123-2350	Distance trolley tube 2500 (L=92.5in.(2350mm))	98.4 (2500)

Spacer trolley for aluminum profiles,

The spacer trolley for aluminum profiles is a single product (TTEEAN01025). The length of the product depends on the configuration of the crane. See **Figure 3-51**.

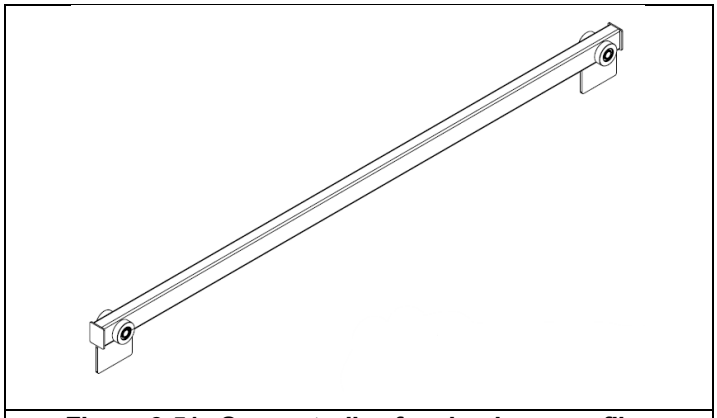


Figure 3-51 Spacer trolley for aluminum profiles

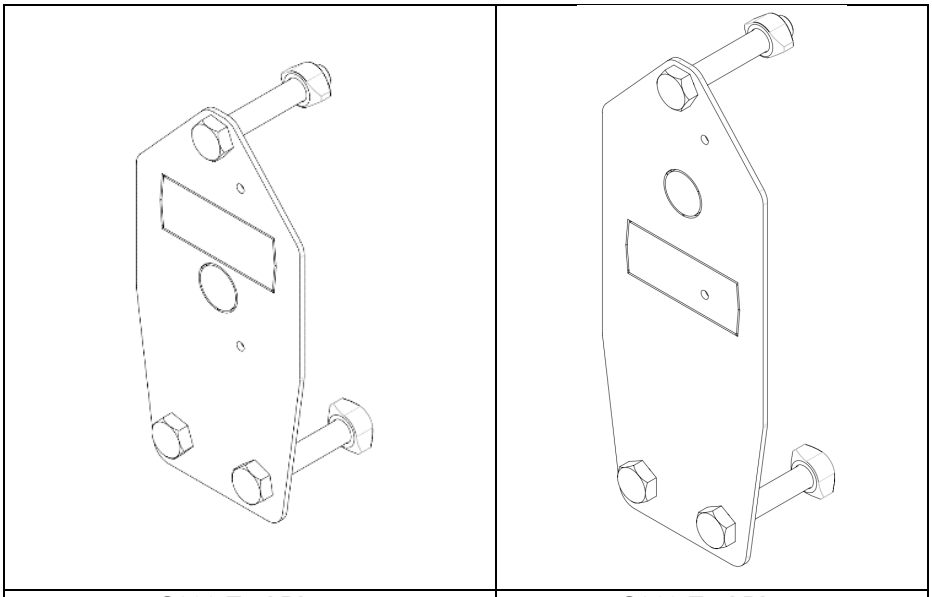
End Plates

Each track with an open end must be closed with an end plate. Before attaching the end plates, make sure that the necessary trolleys and cable trolleys are inside the profile.

NOTICE See the instructions for electrification (**Section 3.5**) before attaching the end plates.

For steel profiles,

1. Place the end plate at the end of the profile.
2. Fit the top fastening bolt and tighten by hand.
3. Install the two lower bolts.
4. Tighten all fastening bolts to 59 lbf-ft (80 N-m).



S200 End Plate	S260 End Plate

Figure 3-52 End Plates for Steel Profiles

For Aluminum profiles,

Slide the brackets into the profile grooves to install the plate to the end of the profile. Tighten all fastening bolts to 18.4 lbf-ft (25 N-m).

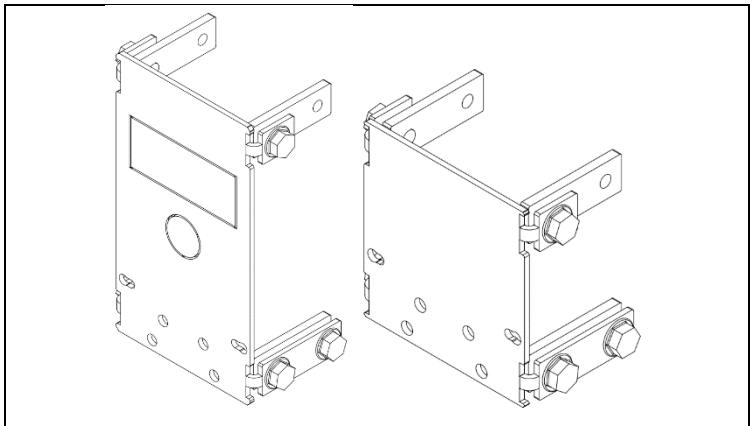


Figure 3-53 Aluminum profile end plates

End Plates with Internal Conductor Electrification

For crane systems that use an internal conductor electrification power supply system, the power supply is connected to the internal conductor bar through the track end plates.

To install the power supply connection,

1. Prepare the end plates. See **Figure 3-54**.
   - Remove the rectangular protection plate (1) from the end plate.
   - If the power supply comes through the end plate to the profile's conductor rail, also remove the round protection plate (2) for cable clamp.
   - The plates can be removed by hitting lightly with a hammer.
2. Install the end plate normally.
   - If the power supply comes through the end plate, see **Section 3.5**.

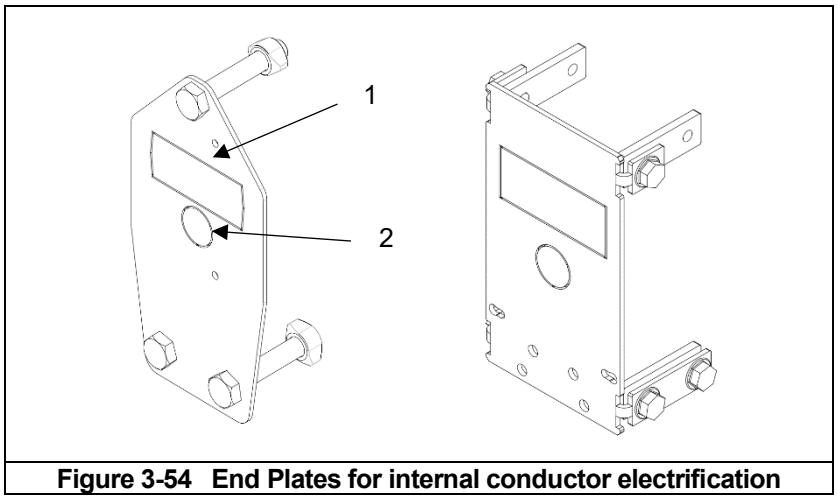


Figure 3-54 End Plates for internal conductor electrification

3.4 Step Four: Bridge Assembly and Installation

After the runway is fully installed including the end truck trolleys, the bridge(s) can be installed.

The assembly of the bridge will be easier if the bridge track can be lifted on supports. It is also recommended to complete assembly of the bridge prior to lifting into position for attachment to the runway.

Typical bridge types:

- Single-girder bridge
- Double-girder bridge
- Raised single-girder bridge
- Raised double-girder bridge

The suspension coupling for trolley (rod end joint) is used on all bridges, excluding raised bridges. Measure and attach bridge suspensions according to the indicated track span; the suspension spacing of the bridge must be the same as the track's span. The overhang of the bridge profile at both ends must be equal, or in accordance with the dimensioning drawings.

NOTICE Hoist trolley **MUST** be installed on the bridge track prior to attaching the bridge track end plates and lifting the bridge into place for attachment to the end truck trolleys on the runway. If equipped with internal conductor electrification, the power collector **MUST** be attached on the hoist trolley and installed on the bridge prior to attaching the bridge track end plates and lifting the bridge into place for attachment to the end truck trolleys on the runway.

NOTICE If flat cable electrification is used on the bridge(s), flat cable and flat cable trolleys **MUST** be installed on the bridge prior to attaching the bridge track end plates and lifting the bridge into place for attachment to the end truck trolleys on the runway.

NOTICE If internal conductor electrification is used on the bridge(s), the power cable that connects the bridge junction box to the internal conductor bar on the bridge **MUST** be installed on the bridge prior to lifting the bridge into position and connecting it to the runway. For specific instructions on installing the power cable, refer to **Section 3.5.5**.

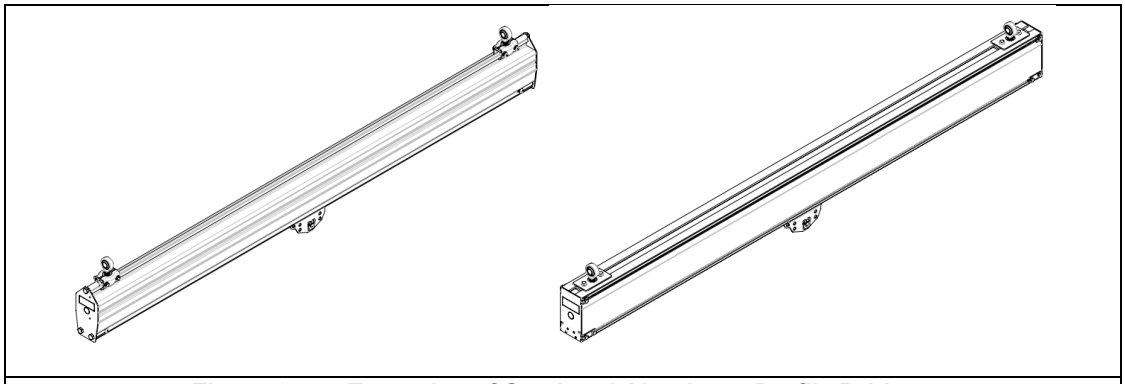


Figure 3-55 Examples of Steel and Aluminum Profile Bridges

Refer to **Figure 3-56** for attachment of the bridge track to the runway end truck trolley. The end truck trolley suspension pin is installed through the rod end suspension of the bridge track.

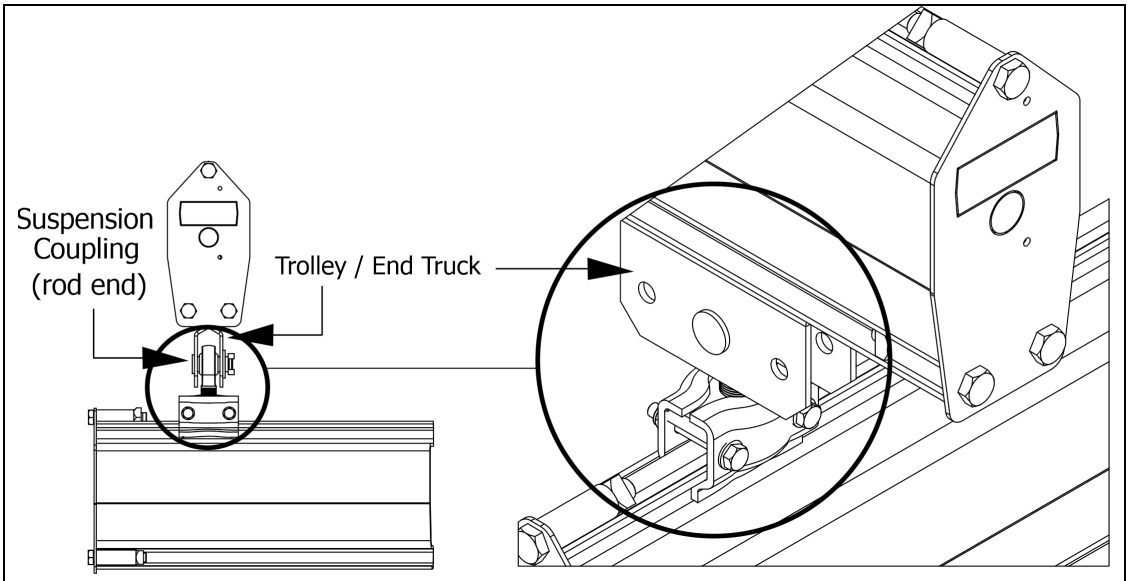


Figure 3-56 Bridge connection to the runway

Steel profile 200 / 260

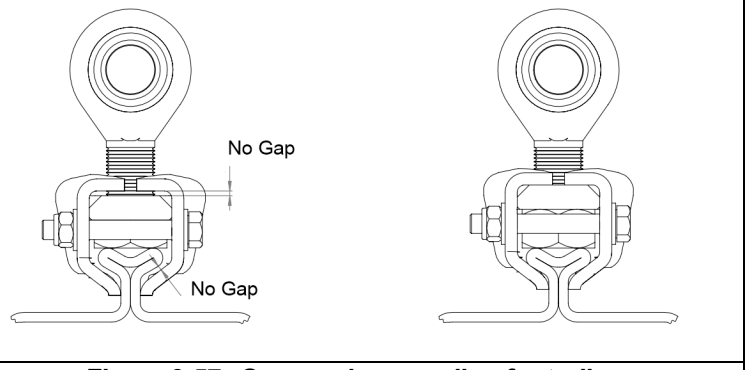


Figure 3-57 Suspension coupling for trolley

⚠ CAUTION Confirm **NO GAP** between track clamp, suspension coupling, and profile. See **Figure 3-57**.

Triangle Support

Triangle supports are recommended for use when the bridge is more than 19.7 ft. (6 m) long. Two trolleys and a bogie girder are used with the triangle support.

1. Lightly attach the track clamps to the profile top. A long nut will be inserted inside the track clamp.
2. Place the triangle support's plate on top of the profile so that the flanges on the triangle support plate point upwards inside the bogie girder.
3. Lightly attach the triangular support's plate to the track clamps.
4. Pull the plate towards the center of the bridge until the flanges on the triangle support's plate contact the inner edge of the bogie girder.
5. Tighten the track clamps to 18.4 lbf-ft (25 N-m).
6. Tighten the mounting bolts on the triangular support's plate to 110 lbf-ft (150 N-m).

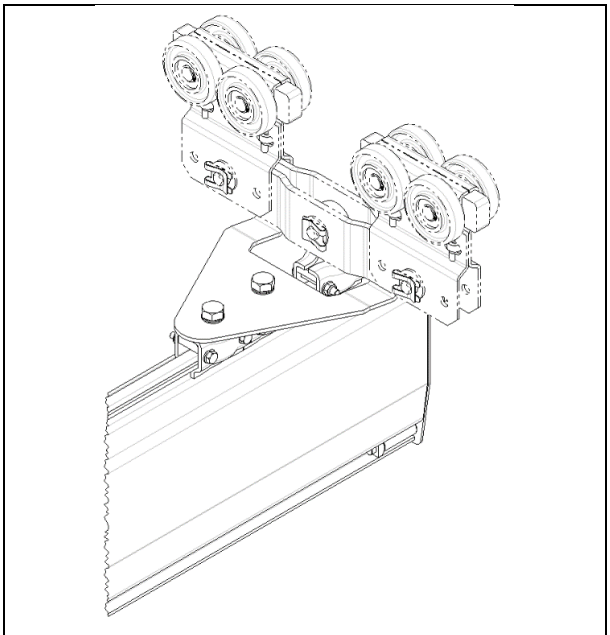


Figure 3-58 Triangle support

When installing the triangle support, the flanges of the triangle support's plate must be touching to the inner edge of the bogie girder at both ends of the bridge. See **Figure 3-59** and **3-60.**

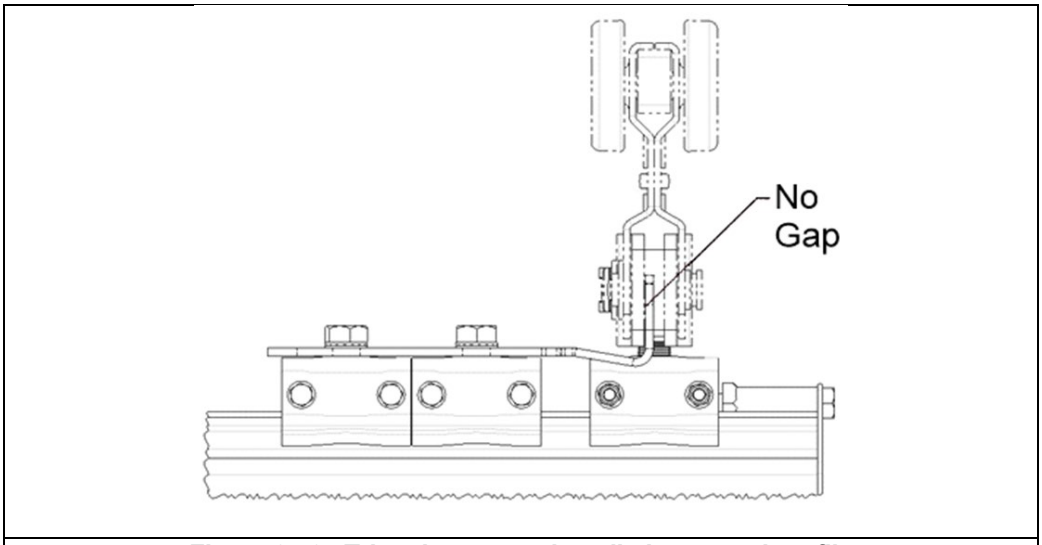


Figure 3-59 Triangle support installation – steel profile

Table 3-19 Triangle Support Assembly – Steel Profile S200/260

Part Number	Qty	Description	Torque lbf-ft (N-m)
TTE430307	1	Plate for triangle support	110 (150)
TTE430315	1	Bolt kit for triangle support	
TTE430101	2	Track Clamp 200/260	18 (25)
TTE430313	2	Rectangular nut	

⚠ WARNING Avoid collisions between lifting equipment (end trucks, man lift, etc.) and the supporting crane structure. Keep fingers and hands clear of any potential pinch points or objects that can slide within the enclosed track, such as trolleys.

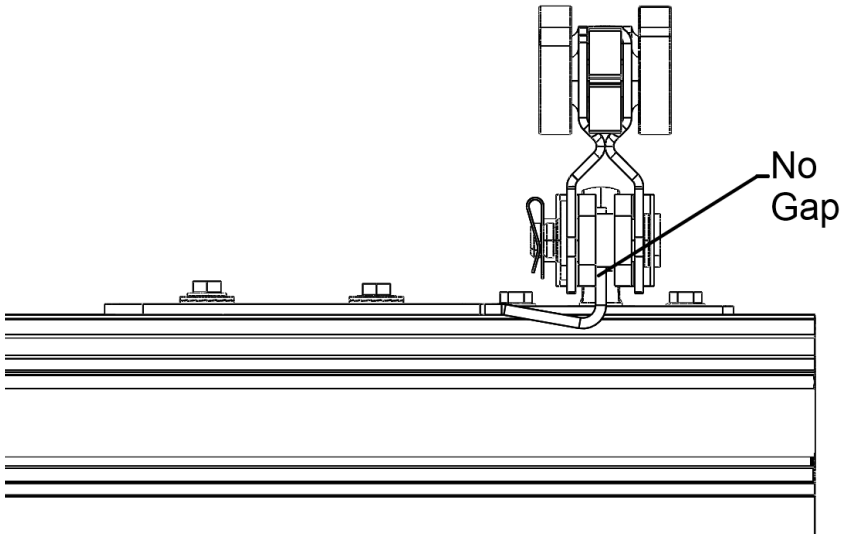


Figure 3-60 Triangle support installation – aluminum profile

Table 3-20 Triangle support assembly – aluminum profile			
Part Number	**Qty**	**Description**	**Torque lbf-ft (N-m)**
TTE430307	1	Plate for triangle support	110 (150)
TTE430315	1	Bolt kit for triangle support	
TTEEAN18010	2	Nut plate	

Bridge Assembly, raised bridge, single or double-girder bridge.

1. Install the hoist trolley(s) or hoist saddle and any cable trolleys into the profile.
2. Close profile ends with raising parts.
3. Install the end supports on the raising parts.

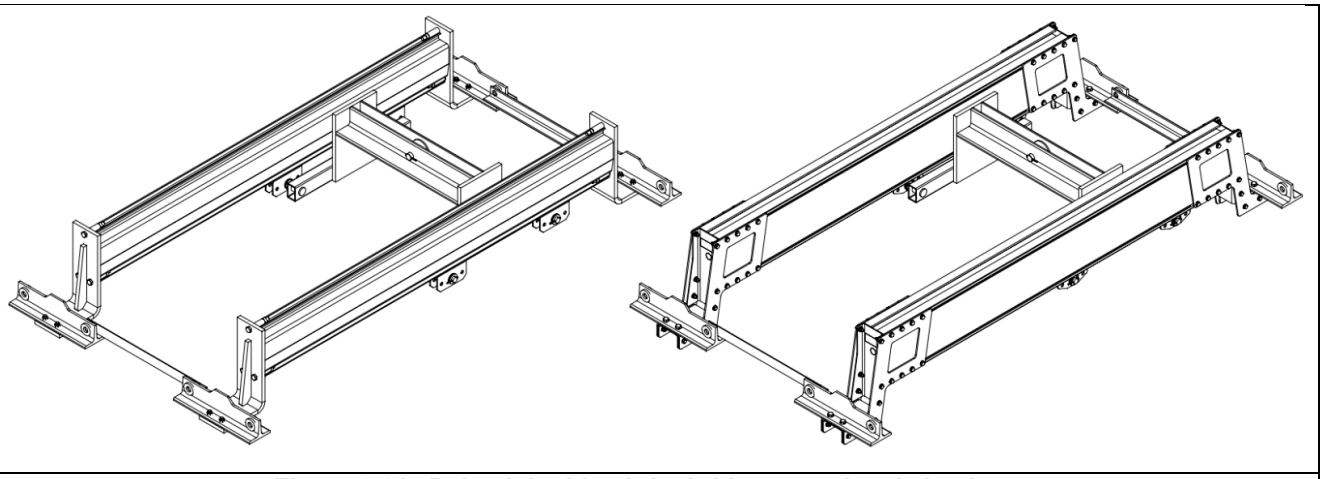


Figure 3-61 Raised double girder bridges, steel and aluminum

(The distance rod between bridges is shown in the pictures at this stage for illustrative purposes.)

1. Install the hoist on the bridge.
2. Lift the bridge in place so that the end supporters go into the trolleys on the track.
3. Lock the bridge into the trolleys with suspension shafts and add the distance rod. Lock the bridge in the trolleys with locking pins.

⚠ WARNING Avoid collisions between lifting equipment (end trucks, man lift, etc.) and the supporting crane structure. Keep fingers and hands clear of any potential pinch points or objects that can slide within the enclosed track, such as trolleys.

3.5 Electrification Installation

There are two different power supply electrification types available when a crane is configured with an electric hoist: internal conductor electrification (ICE), and festooned flat cable electrification.

The power supply of the crane must always be connected to the property's power grid via a power disconnect switch. A power disconnect switch must be installed in the immediate vicinity of the crane. The disconnect switch must be accessible, and it is recommended to be installed at chest height (follow national regulations).

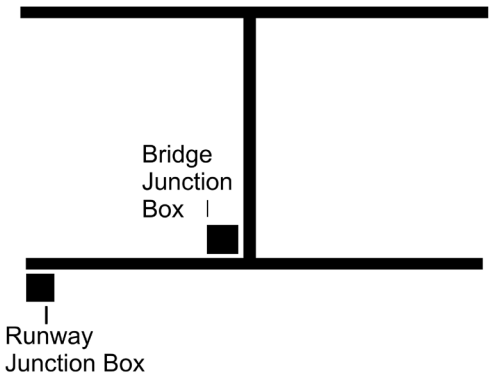
NOTICE Always follow national regulations and guidelines.

NOTICE The power supply of the crane must always be connected to the property's power grid via a power disconnect switch.

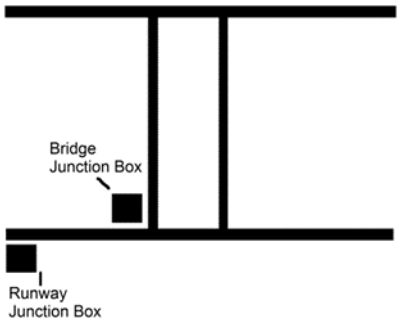
NOTICE Only an authorized electrician may connect the power supply to the crane.

⚠ WARNING Connecting the crane to the property's power grid should always be the final step. **DO NOT** energize system during installation.

Tiger track workstation cranes that are equipped with electric hoists employ junction boxes located at the end of the runway and on each bridge to distribute power to the hoist.



Single girder bridge



Double girder bridge

Figure 3-62 Top view of crane system junction box layout

3.5.1 Internal Conductor Electrification Track Installation

⚠ WARNING The internal conductor rail must always be equipped with a service switch.

Connecting track pieces equipped with an internal conductor rail

1. Slide the conductor guides (1.3) on to the end of the copper strips of the conductor rails.
   a. Make sure the plastic conductor profiles are inside the metal track profile approximately 1/16 in. (1.5 mm). This allows a 1/8 in. (3 mm) gap between the plastic profiles for thermal expansion.
2. Place the cable connectors (1.1) and guide pins (1.2) as shown.
   a. Push the guide pins, into the same conductor rail up to the collars in the middle of the pins (1.2).
3. Install the ends of profiles against each other. The grounding lines must be on the same side and the profiles must be parallel.
4. Slide the ends of track pieces slowly against each other.
   a. The guide pins go first to the opposite conductor rail.
   b. Next, the copper strips of the conductor rail enter the wire connectors (guide the wire connectors, if necessary, for example by using a screwdriver).
5. Connect track pieces using connecting bolts (joining pieces for aluminum profiles). If necessary, see the **Section 3.3.13** for track joint assembly instructions.

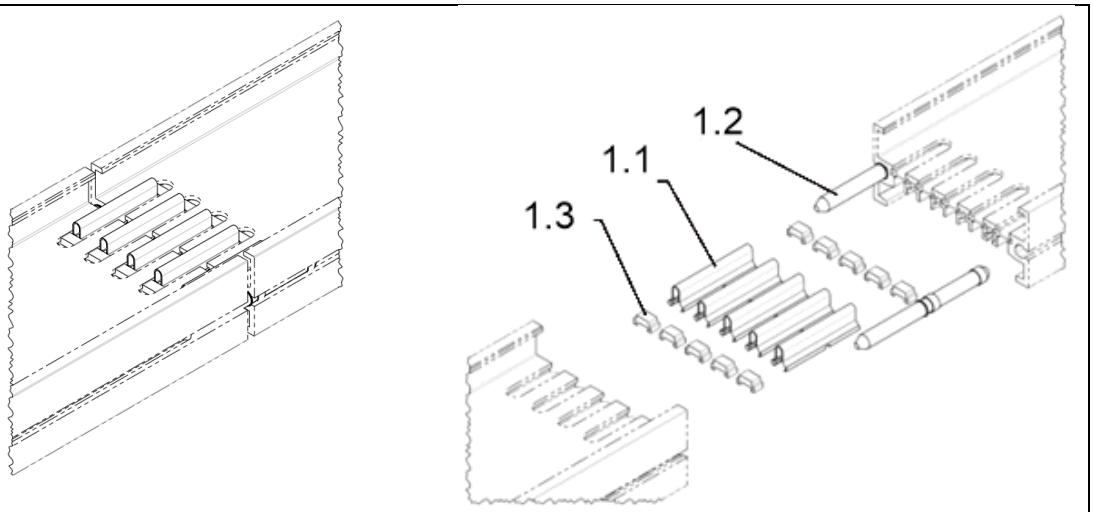


Figure 3-63 Joint for combining sections of internal conductor electrification

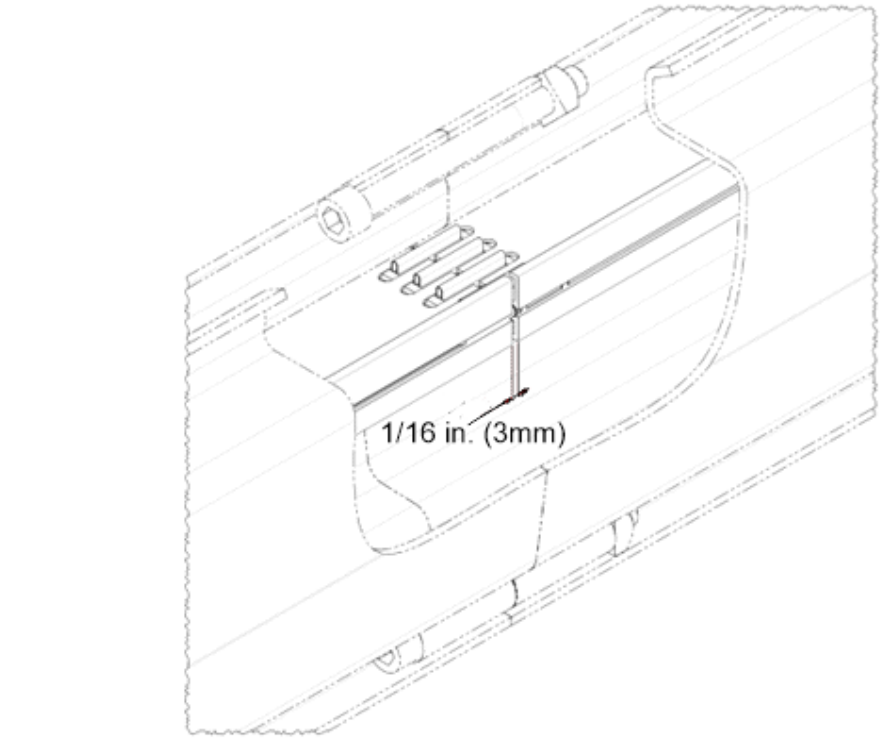


Figure 3-64 Gap between PVC segments when fully assembled

Installation of the Current Collector on the Trolley

The current collector is installed in the towing arm that comes with the trolley. The installation of the current collector on the conductor rail is carried out during the installation of the trolleys. The current collector can only be mounted on the conductor rail in the right direction (the alignment pin comes on the opposite side of the grounding line).

Current collector with trolley for aluminium profile, TTEEAN01001

Remember to attach the grabber pins (1.2) to both sides of the aluminium trolley. The current collector comes between these pins in the aluminium trolley. Lock the pins with nuts.

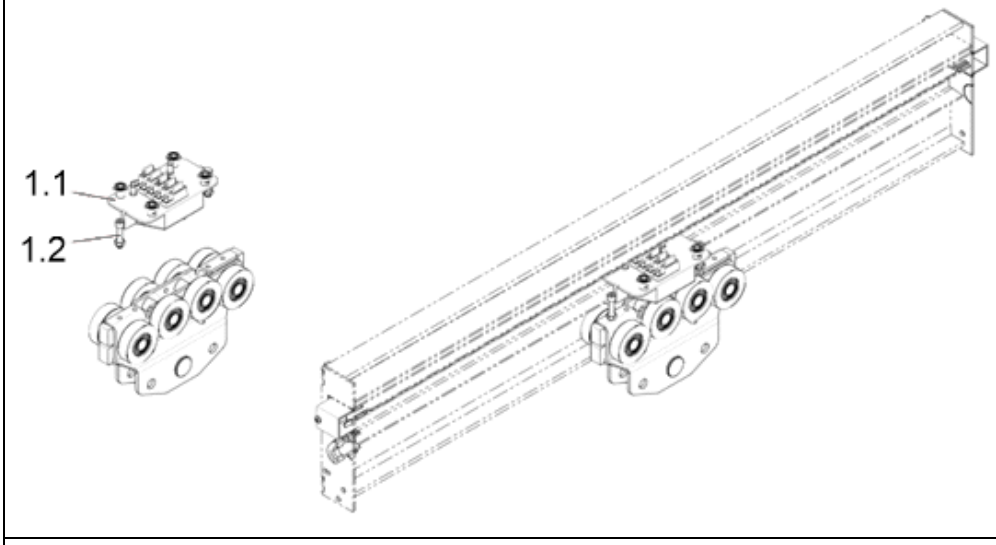


Figure 3-65 Collector Mounted on Trolley

Feed the collector cable through the center of the trolley and secure the power cable with a zip tie by using the holes in the trolley body. See **Figure 3-65** below.

Table 3-21: Collector and collector retainer mounted on trolley

Part Number	Reference Fig #3-65	Quantity	Description
TTEVGE35516C	1.1	1	Collector, GE35, 16A 5 poles
TTEEAN18200	1.2	1	Collector retainer kit - Aluminum
TTEVGE35516C	1.2	1	Collector retainer kit - Steel

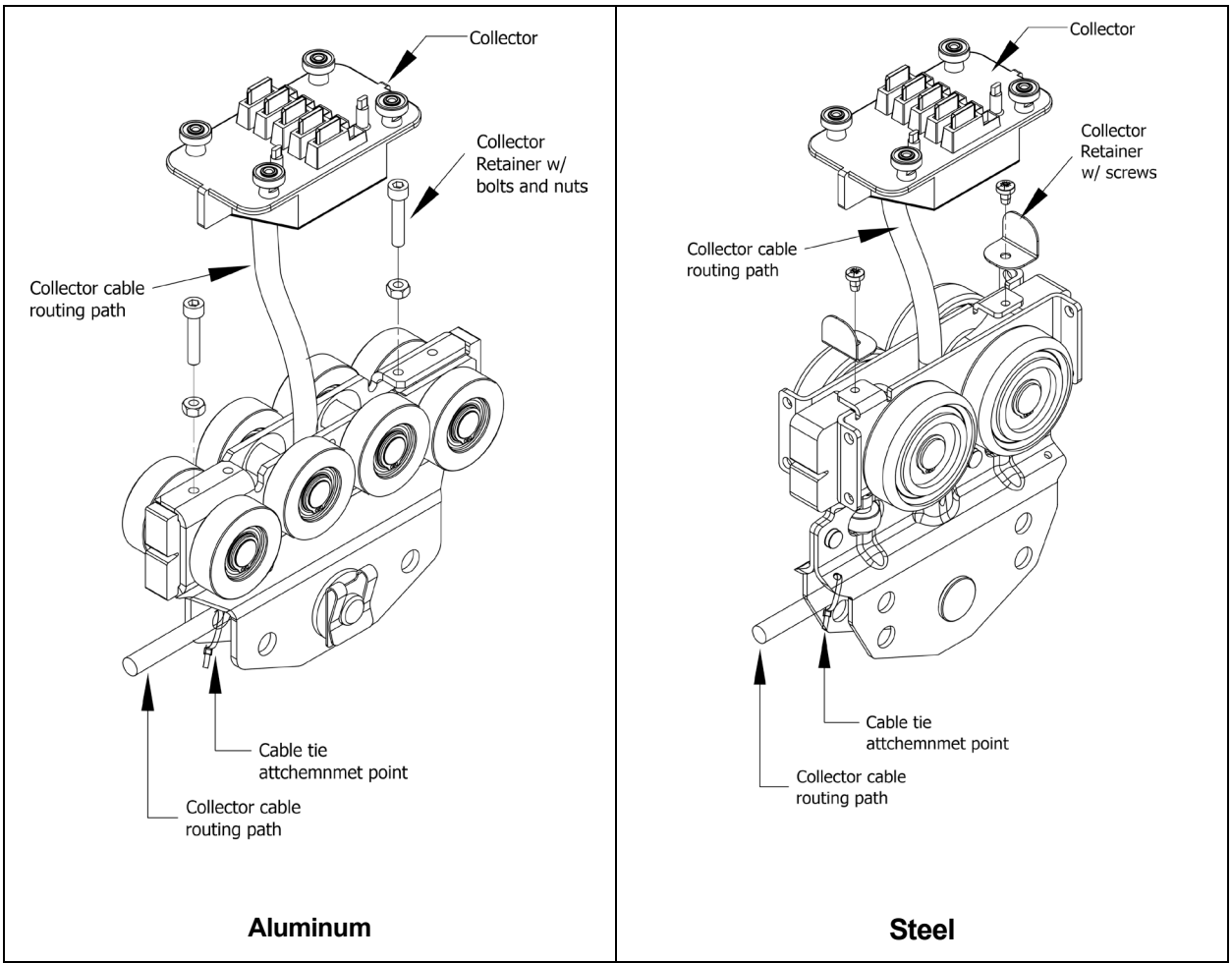


Figure 3-66 Collector Mounted on Trolley

Strip the end of the collector cable 4 in. (100mm) to expose the wires to connect to the terminal block. Each of the connecting wires are to be stripped back 3/8 in.(10mm) +/- 1/16 in. (2mm). Make sure to fully insert the stripped wires to reach the bottom of the terminal block.

3.5.2 Flat Cable Electrification

When the crane utilizes flat cable festooning for power distribution, cable trolleys as well as a tow cable must be used. The trolleys should be installed every 5 ft. (1.5m) for the length of the cable.

NOTICE If flat cable electrification is used on the bridge(s), flat cable and flat cable trolleys **MUST** be installed on the bridge prior to attaching the bridge track end plates and lifting the bridge into place for attachment to the end truck trolleys on the runway.

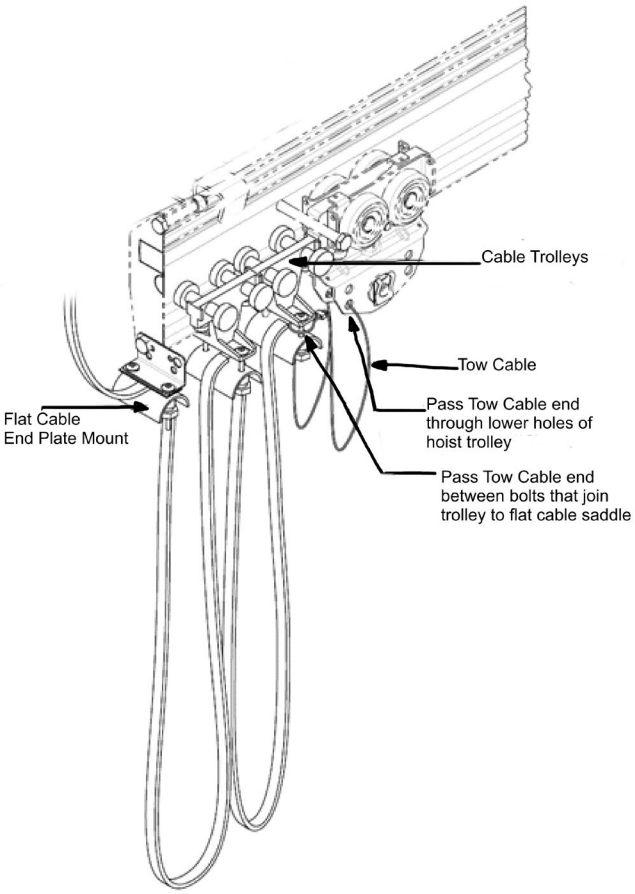


Figure 3-67 Tow cable and Flat Cable Festooning

The tow cable must be installed between the hoist trolley and the adjacent cable trolley located behind it. Thread one of the looped ends of the cable through the lower hole in the trolley. Bring the looped ends of the cable to the bolts of the cable trolley above the cable saddle. See **Figure 3-67** above.

3.5.3 Power Supply to the Crane System

It is the customer's responsibility to properly connect a power source to Tiger Track Workstation cranes when configured for electric hoist power. Properly sized conductors must be used to accommodate the maximum current draw for the crane system.

⚠ WARNING Refer to total AMP draw and NEC® (ANSI/NFPA 70, "National Electric Code") guidelines when sizing appropriate Power Supply Cable gauge. Always consult with a qualified person when appropriate Power Supply Cable sizing is in question.

⚠ CAUTION Use a flexible conduit to connect facility power supply to runway junction box. This will prevent binding and allow articulation of the runway track.

⚠ CAUTION Fuse/Breaker Capacity - The crane's power supply should be equipped with current overload protection such as fuses, which should be selected for 110% to 120% of total listed full load amperage, and should be dual element time-delay fuses. Refer to the hoist owner's manual for the full load amperage draw.

⚠ DANGER Before proceeding with maintenance or inspection of crane system, ensure that the electrical supply for the crane and hoist has been de-energized (disconnected).

Lock out and tag out in accordance with ANSI Z244.1 “Personnel Protection -Lockout/Tagout of Energy Sources”.

⚠ DANGER To avoid a shock hazard, **DO NOT** perform **ANY** mechanical or electrical maintenance on the crane or hoist within 5 minutes of de-energizing (disconnecting) the trolley or hoist. This time allows the internal VFD capacitor to safely discharge.

⚠ CAUTION Ensure that the voltage of the electric power supply is proper for the trolley hoist.

⚠ WARNING If the power supply does not comply with NEC standards or is otherwise incorrectly installed, serious injury or death could occur.

3.5.4 Runway Electrification Installation

For Steel Profiles (S200, S260) and Aluminum Profiles with Internal Conductor Electrification

The runway junction box will be shipped with the appropriate output fittings, cable and wire terminal ends installed. It is the customer’s responsibility to install an appropriate power input fitting according to the chosen power supply cable flexible conduit. See **Figure 3-68** below.

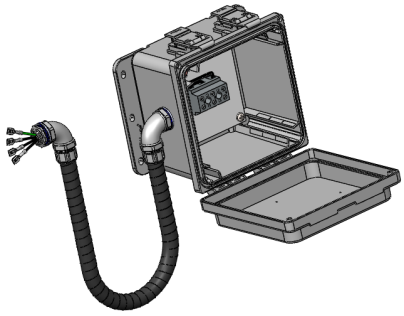


Figure 3-68 Runway Junction Box with Internal Conductor Electrification (Steel S200,260 and ALU4, ALU5)

Step 1: Preparing the End Plate (For Internal Conductor Electrification)

Prior to assembly, the end plate on the power supply side of the runway must be prepared for crane systems that use internal conductor electrification. This preparation includes knocking out the location for the right angle fitting and the ICE conductor rail end cap. These two locations are perforated and can be knocked out with a hammer and a drift. See **Figure 3-69** and **3-70**.

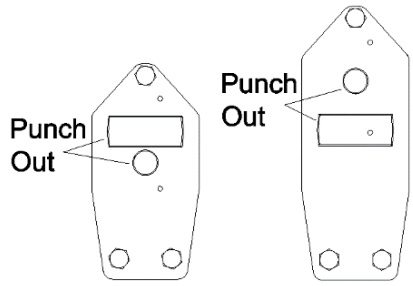


Figure 3-69 Punch out locations for Steel Profile End Plates (S200, S260)

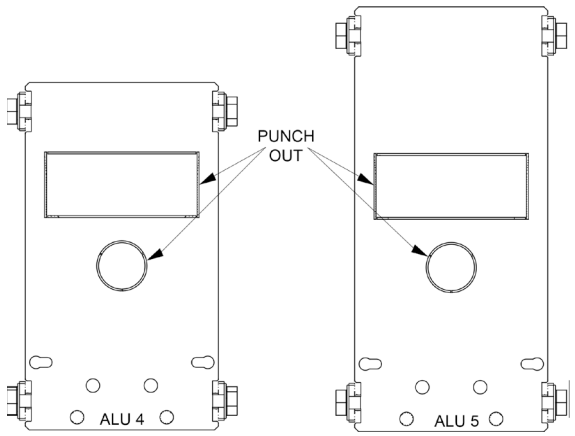
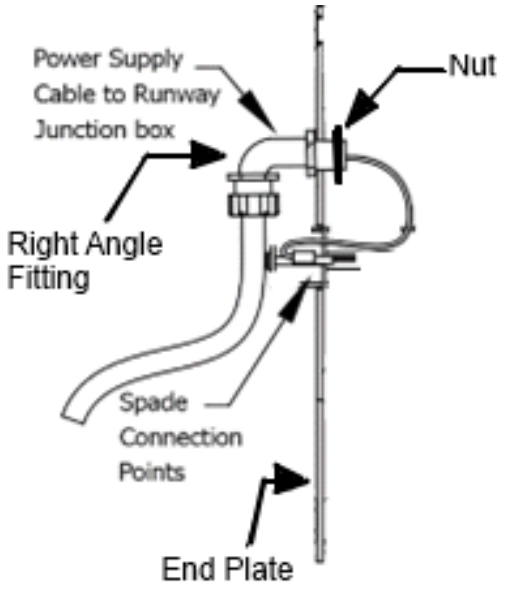


Figure 3-70 Punch out locations for aluminum profile end plates (ALU4, ALU5)

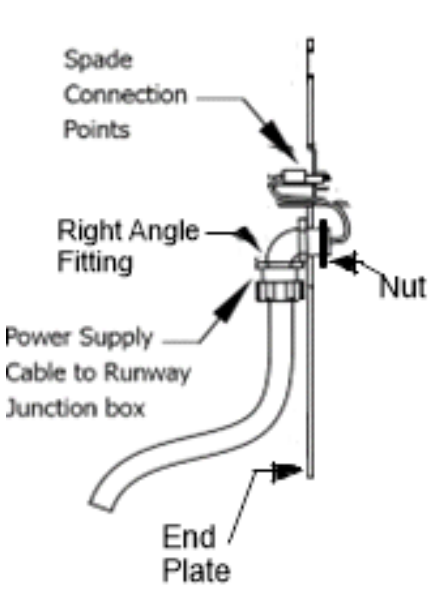
Step 2: Attach Flexible Conduit Right Angle Fitting to Profile End Plate

Attach flexible conduit with right angle fitting to the round hole opened in step 1. Place the nut from the right angle fitting on the inner side of the profile end plate and tighten snug.

⚠ CAUTION Take particular care not to damage electical wires and spade connectors.



Steel S260



Steel S200

Figure 3-71 Conduit to Profile End Plate Connection

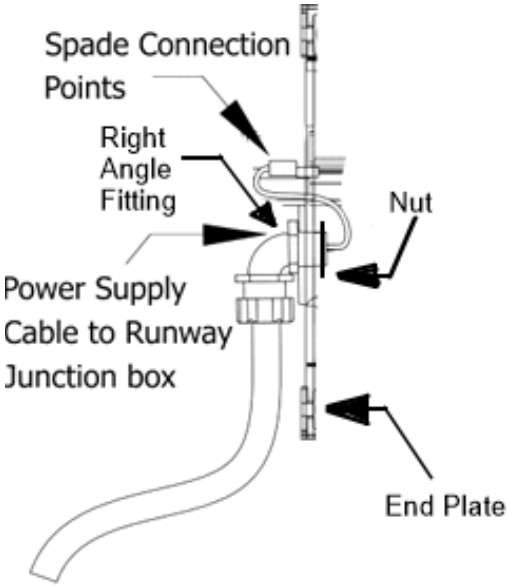


Figure 3-72 Aluminum Profile ALU4 & ALU5 Conduit to Profile End Plate Connection

Step 3: Prepare Junction Box for Installation on Runway

For Steel and Aluminum Profile:

Attach the Mounting Bracket to the Junction Box using the supplied hardware (M6x16, P/N 9091249), and spring washers (M6, Part Number 9012709) attach the mounting bracket to the junction box see **Figure 3-73**.

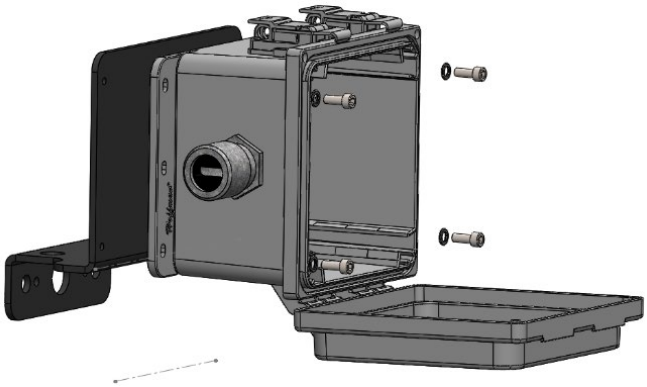


Figure 3-73 Attachment of mounting bracket to junction box – All Profiles Steel Profile (S200 and S260) and Aluminum Profiles (ALU4 and ALU5)

For Steel Profile Only:

Attach L-Bracket to the Universal Mounting Bracket. Using M16x16 hardware (P/N 9091249), attach the L-Bracket (P/N 8360602) to the Universal Mounting Bracket (P/N 8360601) see **Figure 3-74**.

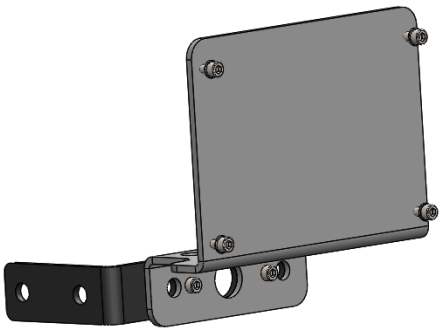


Figure 3-74 Mounting Bracket with L-Bracket Steel Profile Only S260 and S200

For Aluminum Profile Only:

Install a quantity of 2, M16x16 hardware (P/N 9091249) in mounting bracket holes and loosely attach a T- Nut (P/N 9015917) on each M16 bolt. L-Bracket see **Figure 3-75**.

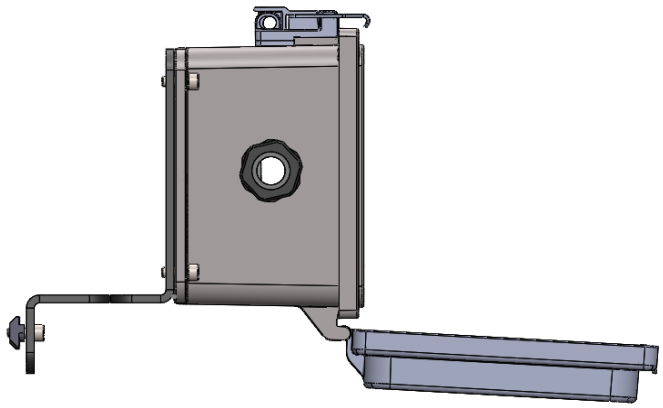


Figure 3-75 Mounting Bracket with L-Bracket Aluminum Profile Only

Step 4: Attaching the junction box assembly to the runway track end plate

For Steel Profile Only (S200 and S260)

Using the included hardware (M12x70 Hex Head Cap Screw, part number 9093151) attach the junction box and mounting bracket assembly to the end of the electrified runway track as seen in **Figure 3-76**. Tighten end plate bolts to **59 lbf-ft (80 N-m).**

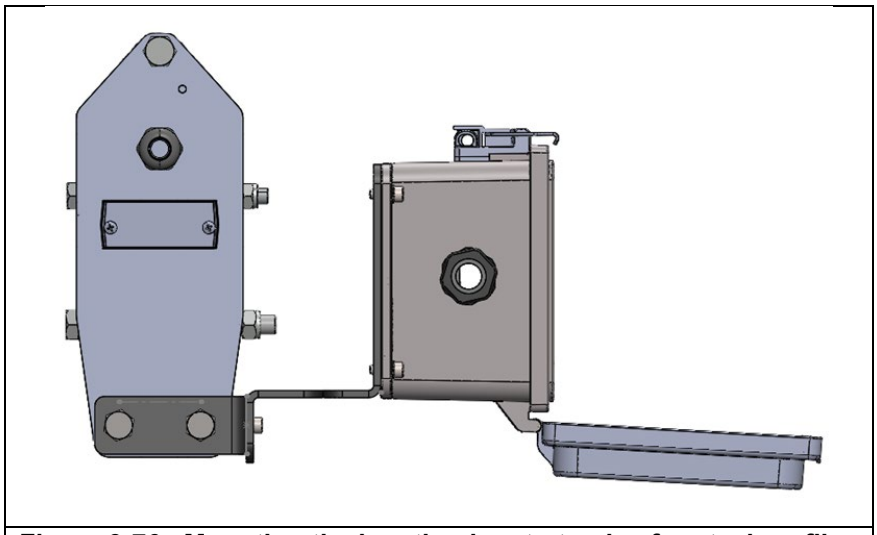


Figure 3-76 Mounting the junction box to track – for steel profiles

For Aluminum Profile Only

Slide the T-Nuts into the profile slots at the end of the track as shown in **Figure 3-77**. Attach end plate with supplied end plate hardware. Tighten end plate bolts to **18.4 lbf-ft (25 N-m).**

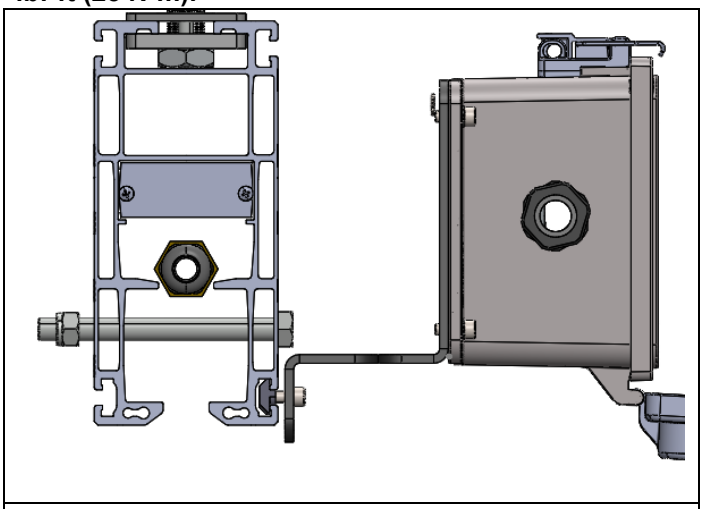


Figure 3-77 Mounting the junction box to track – for aluminum profiles

Step 5: Connect power supply cable to ICE

Feed the power supply cable through the end plate as shown in **Figure 3-78** and **3-79**.

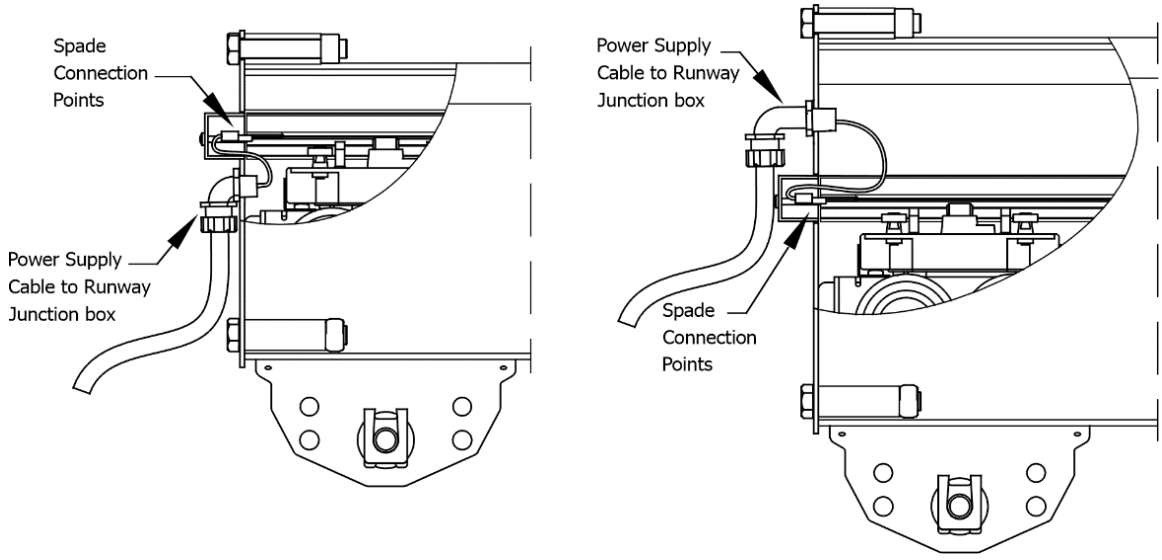


Figure 3-78 Connecting power supply to runway track
Steel Profile S260 and S200 internal conductor electrification

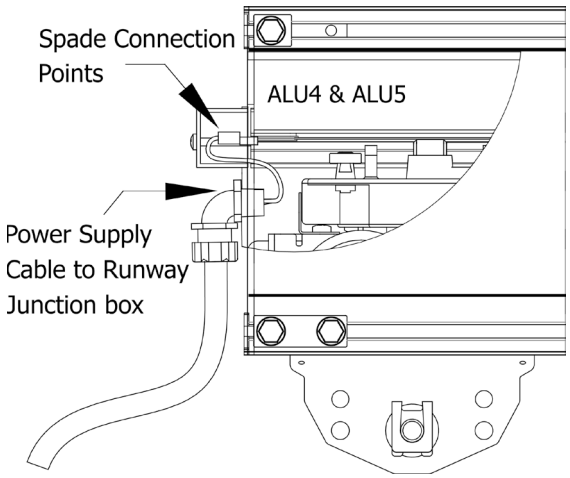


Figure 3-79 Connecting power supply to runway track
ALU4 and ALU5 internal conductor electrification

Attach the conductors of the power supply cord wires to the copper strips on the PVC track according diagram. The terminal connection for three phase power systems are shown in **Figure 3-80**. The terminal connections for single phase power are shown in **Figure 3-81**.

⚠ CAUTION For systems equipped with internal conductor electrification, the ground side of the track is indicated with a sticker label reading “GROUND SIDE” at the end of the track piece.

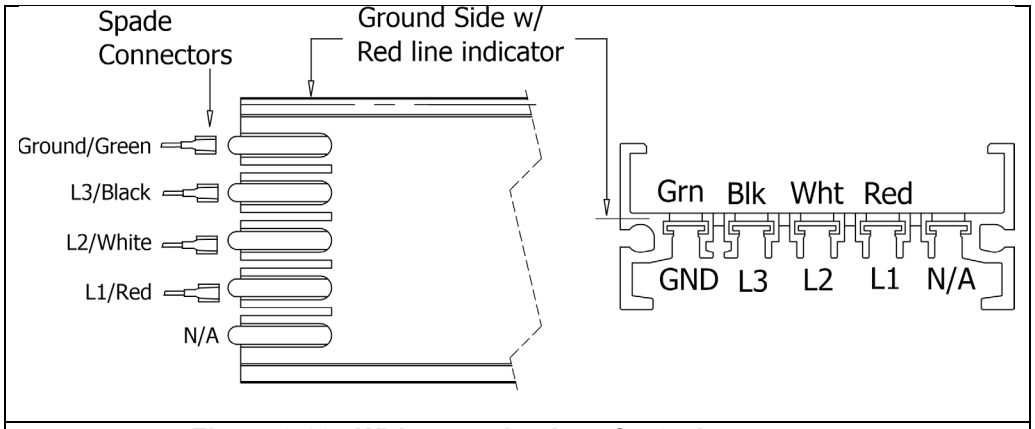


Figure 3-80 Wiring terminations for 3-phase power

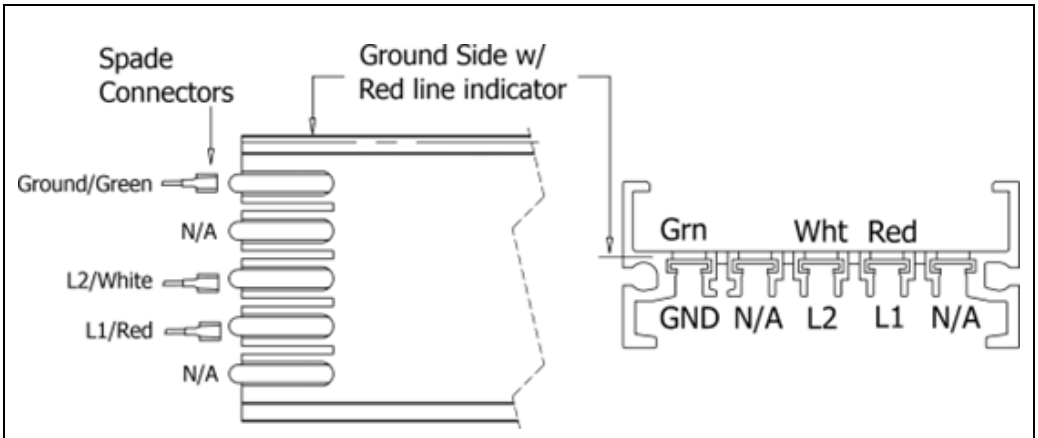
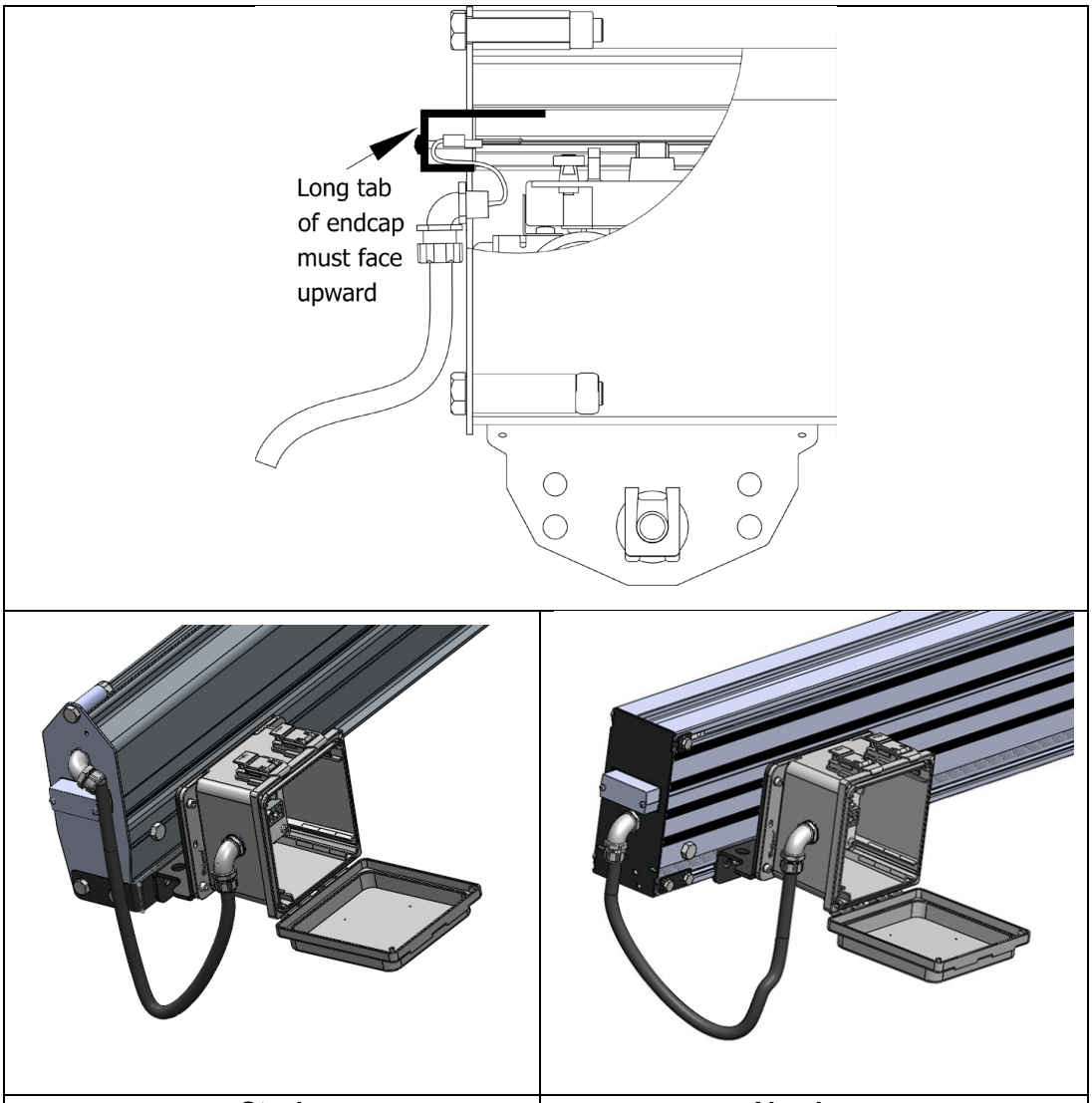


Figure 3-81 Wiring terminations for single-phase power

Install rectangular end cap over the wiring connections (part of kit, part number TTE45001) with the longer tab upward, and tighten both screws. See **Figure 3-82** for reference.



Steel	Aluminum

Figure 3-82 Wiring connection from junction box to runway track

NOTICE It is the user's responsibility to provide input power to the junction box. This may include drilling holes for cable fitment and intalling cable glands to accommodate power input cable installation.

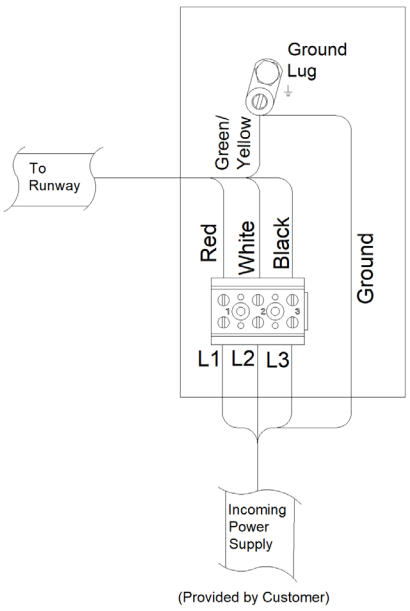


Figure 3-83 Wiring diagram for 3 phase power - ICE

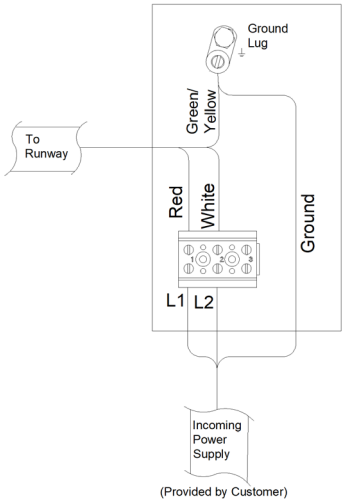


Figure 3-84 Wiring diagram for single phase power - ICE

For Flat Cable Electrification

Flat cable electrification uses a festoon system that is anchored to the end of the track using a flat cable clamp. The flat cable clamp is mounted to the end of the track as shown in **Figures 3-85** and **3-86**. After exiting the junction box, the flat cable is fed through the flat cable clamp and tightened in place.

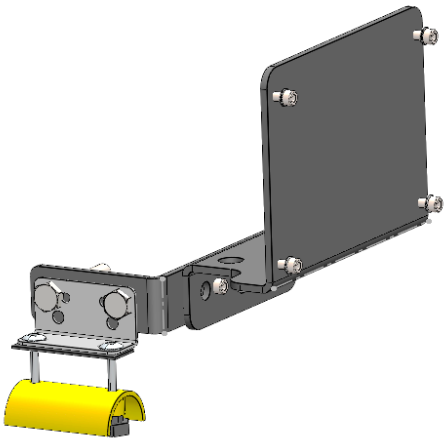


Figure 3-85 Connecting power supply to runway track – flat cable electrification – steel profiles

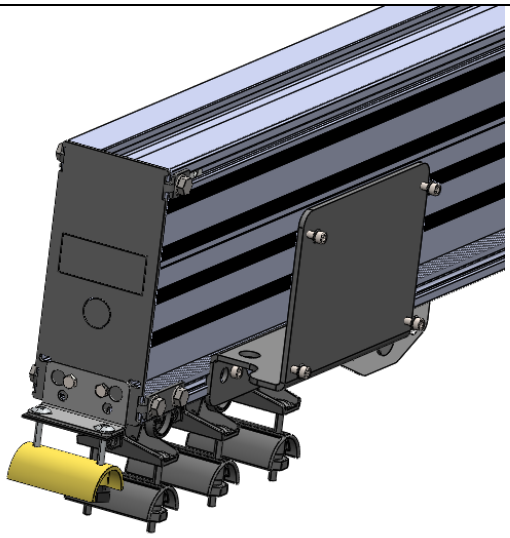


Figure 3-86 Connecting power supply to runway track – flat cable electrification – aluminum profiles

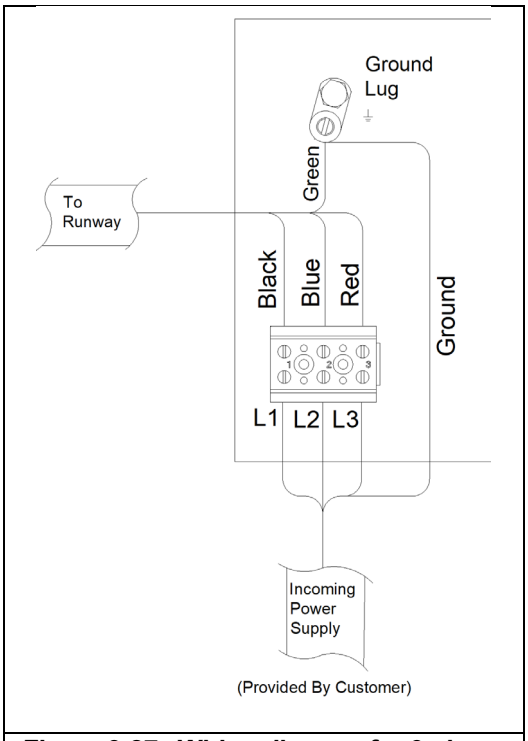


Figure 3-87 Wiring diagram for 3 phase power – flat cable

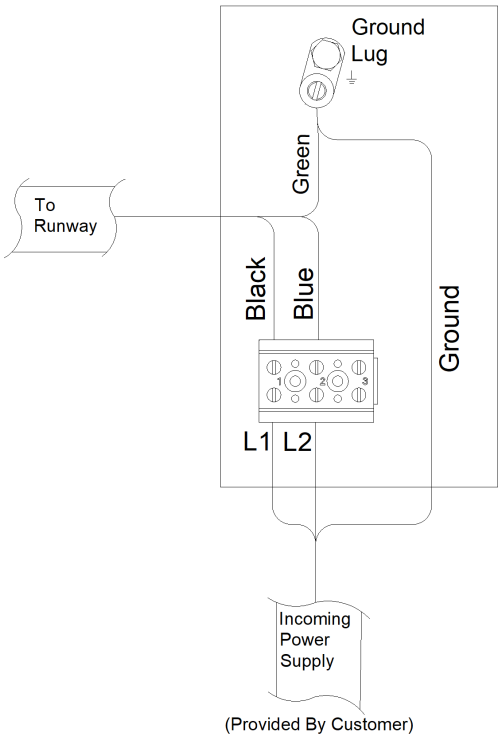


Figure 3-88 Wiring diagram for Single phase power – flat cable

3.5.5 Junction Box Assembly and Installation – Bridge

To determine the proper installation of the bridge junction box and electrification, first determine the type of bridge configuration used on the workstation crane system.

There are two headroom heights available,

Headroom Types
Standard
Low Headroom

There are two profile materials available, and all sizes of either steel or aluminum profiles apply to the applicable installation instructions.

Profile Materials
Steel
Aluminum

There are two girder configurations available,

Girder Orientations
Single
Double

There are two electrification styles available,

Electrification Styles
Internal Conductor Electrification (ICE)
Flat Cable Electrification

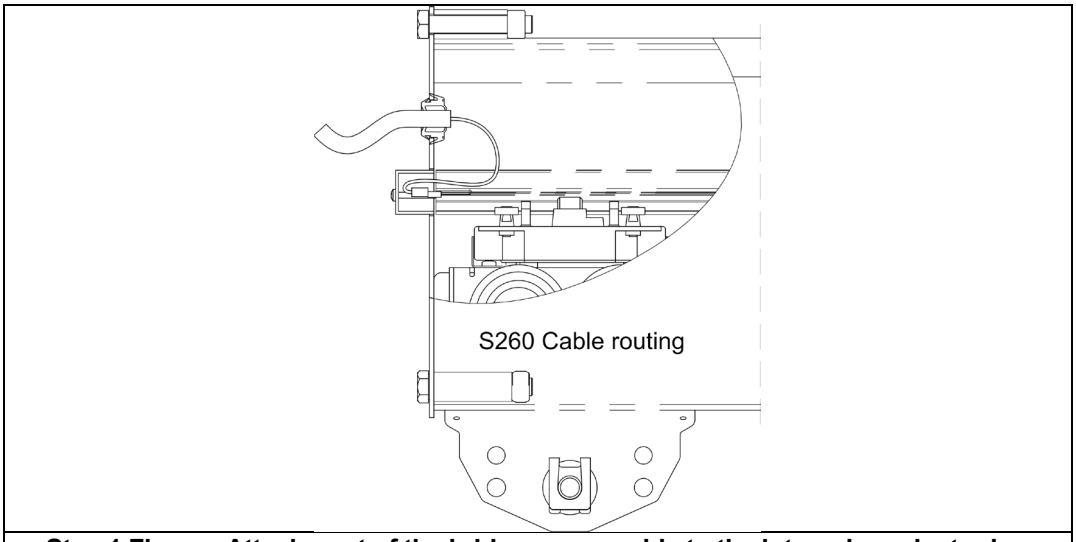
Once the bridge configuration is determined, proceed through the following section of this manual to find installation instructions for the particular configuration.

Standard Headroom Bridges
Standard Headroom
Steel Profile Single Girder Bridge with Internal Conductor Electrification

Step 1: Attach the power cable to the bridge internal conductor bar

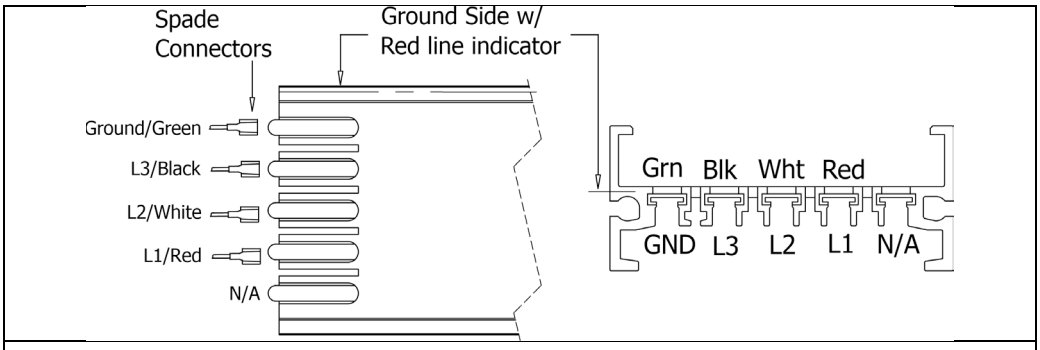
Before proceeding with bridge installation, install the bridge power cable to the bridge internal conductor bar as shown in the figure below.

NOTICE When internal conductor electrification is used on the bridge(s), the power cable that connects the bridge junction box to the internal conductor bar on the bridge **MUST** be installed on the bridge prior to lifting the bridge into position and connecting it to the runway.

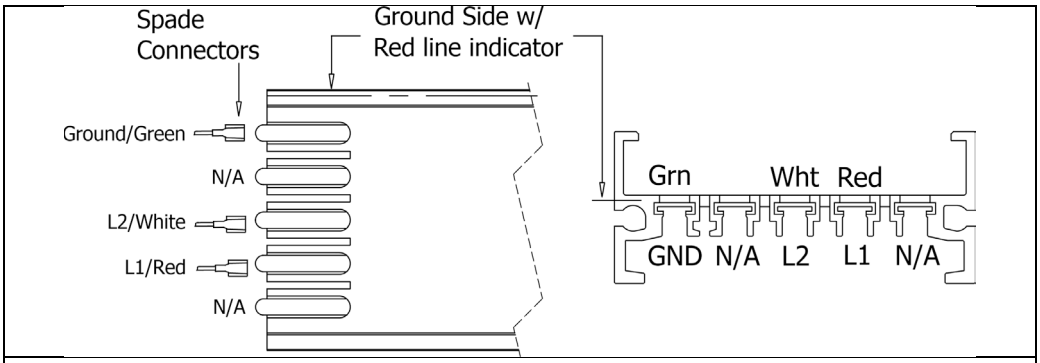


Step 1 Figure Attachment of the bridge power cable to the internal conductor bar

⚠ CAUTION For systems equipped with internal conductor electrification, the ground side of the track is indicated with a sticker label reading “GROUND SIDE” at the end of the track piece.



Wiring connections for 3-phase power

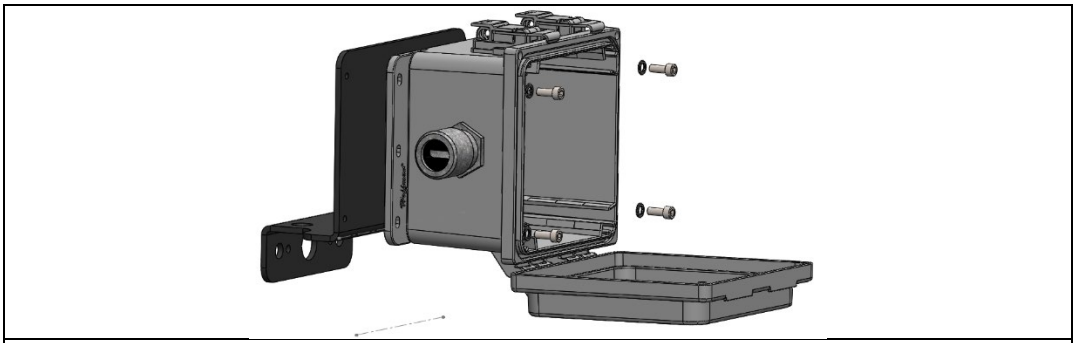


Wiring connections for single-phase power

Step 1 Figure Individual conductor attachments for bridge internal conductor bar

Step 2: Attach the junction box to the universal mounting bracket

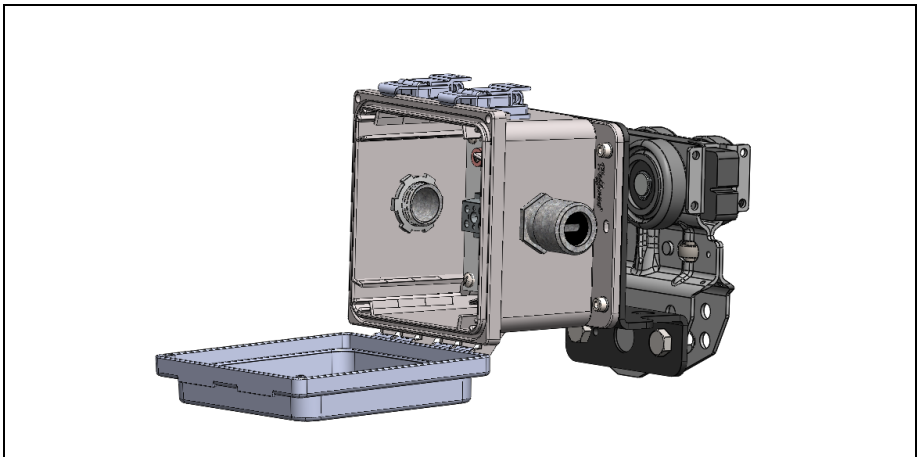
Using the supplied screws (M6x16, Part Number 9091249), and spring washers (M6, Part Number 9012709) attach the junction box to the universal mounting bracket as shown in the figure below.



Step 2 Figure Attachment of the junction box to the universal mounting bracket

Step 3: Attach the junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

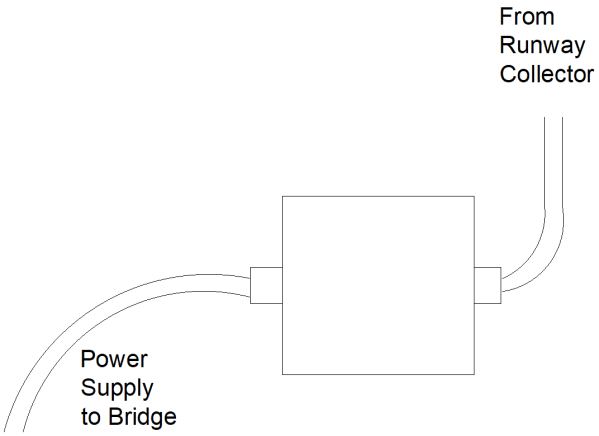


Step 3 Figure Installation of the junction box and bracket assembly onto the end truck trolley

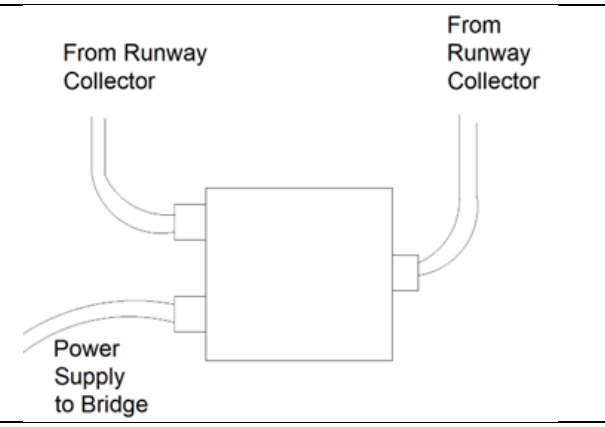
Step 4: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



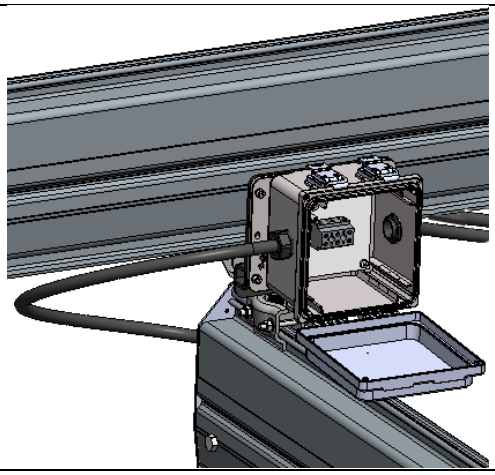
Step 4 Figure Junction box connections diagram – flat cable or ICE single collector runway



Step 4 Figure Junction box connections diagram – ICE dual runway collectors

Step 5: Connect bridge ICE cable into junction box

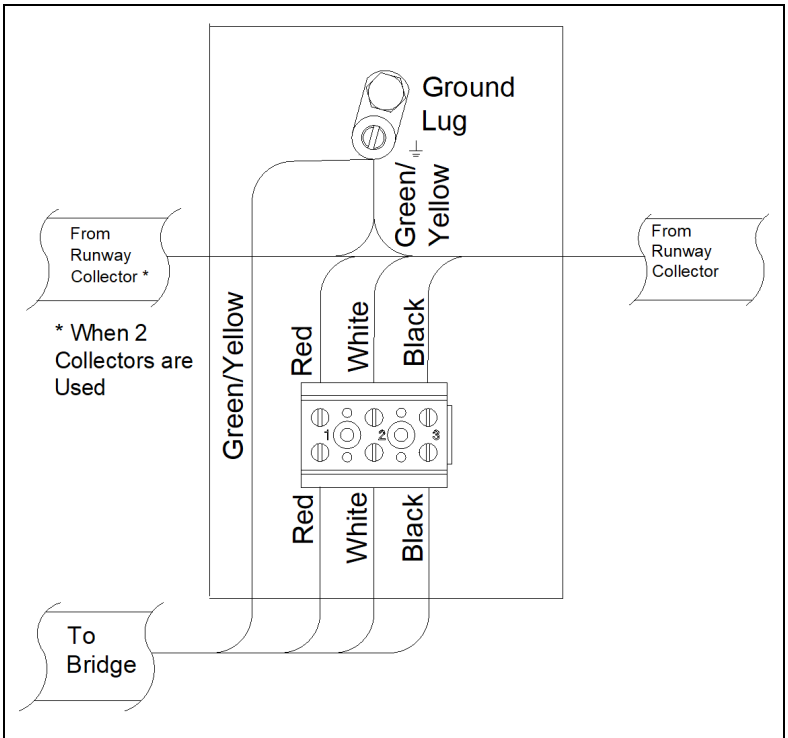
As shown in the image below, feed the already installed ICE power cable from the bridge into the junction box through the cable fitting on the lower left side of the junction box.



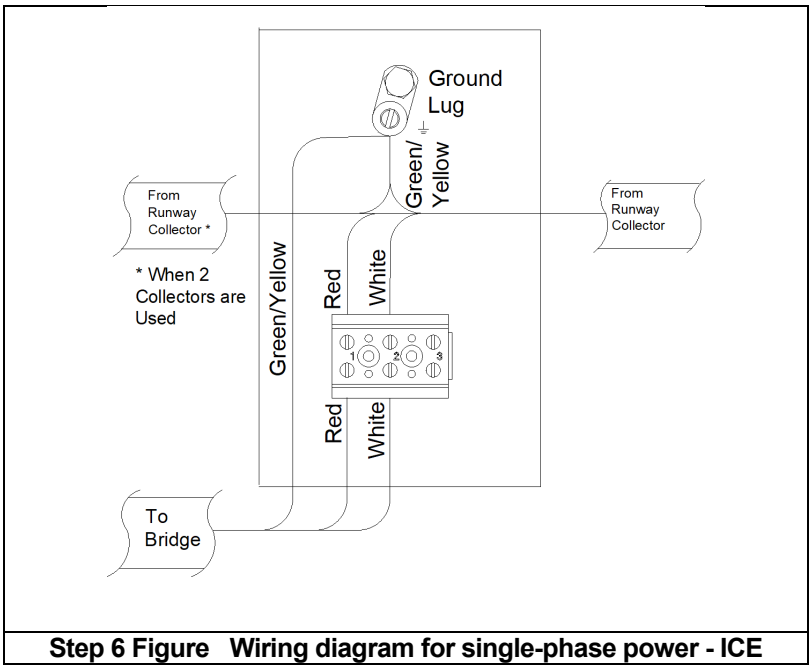
Step 5 Figure Power cable connection between junction box and bridge

Step 6: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the image below.



Step 6 Figure Wiring diagram for 3-phase power - ICE



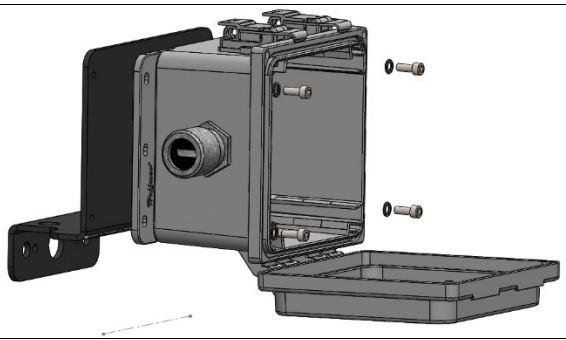
Step 6 Figure Wiring diagram for single-phase power - ICE

Standard Headroom
Steel Profile Single Girder Bridge with Flat Cable Electrification

NOTICE Before proceeding, verify that the flat cable and flat cable trolleys are installed on the bridge. The following steps for electrification installation cannot be completed unless the flat cable is installed.

Step 1: Attaching junction box to universal mounting bracket

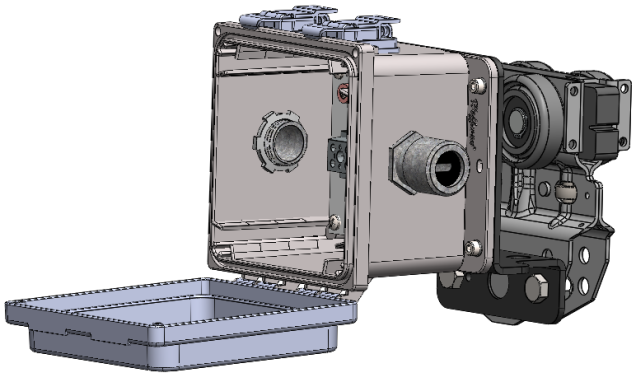
Using the supplied hardware (M6x16, Part Number 9091249),and spring washers (M6, Part Number 9012709), fix the junction box to the universal mounting bracket as shown in the figure below.



Step 1 Figure Attachment of the junction box to the universal mounting bracket

Step 2: Attaching junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

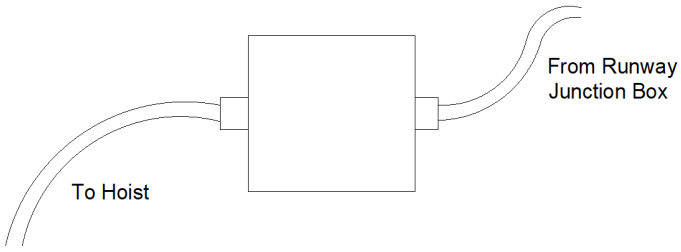


Step 2 Figure Installation of the junction box and bracket assembly onto the end truck trolley

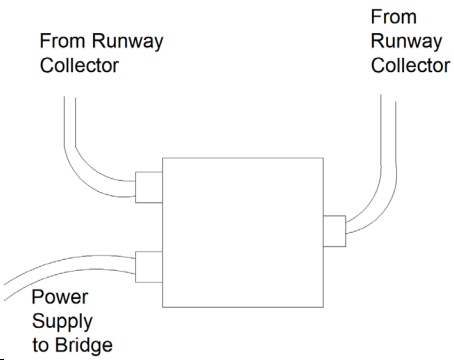
Step 3: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



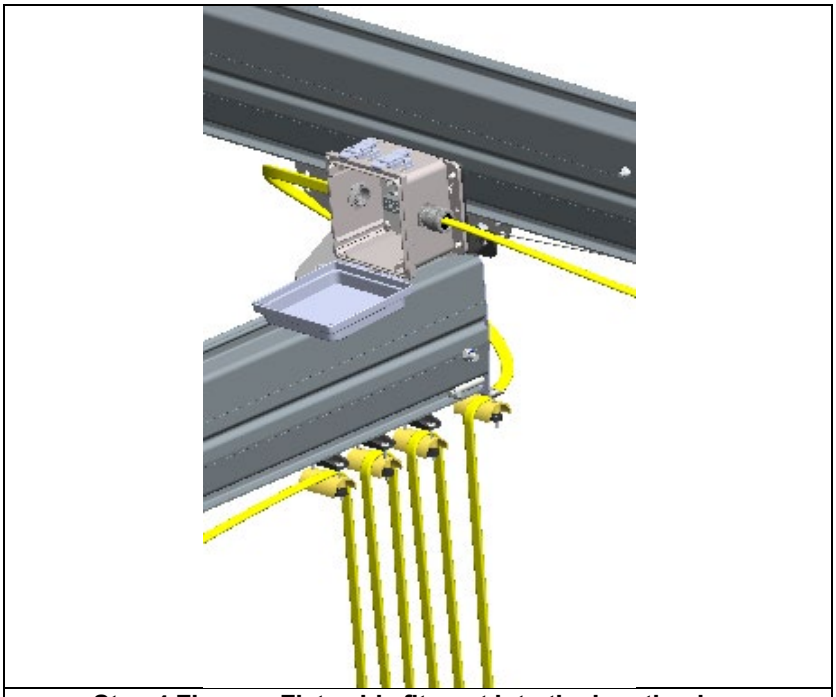
Step 3 Figure Flat cable fitment into the junction box – flat cable or ICE single collector runway



Step 3 Figure Flat cable fitment into the junction box – ICE dual runway collectors

Step 4: Connect bridge flat cable into junction box

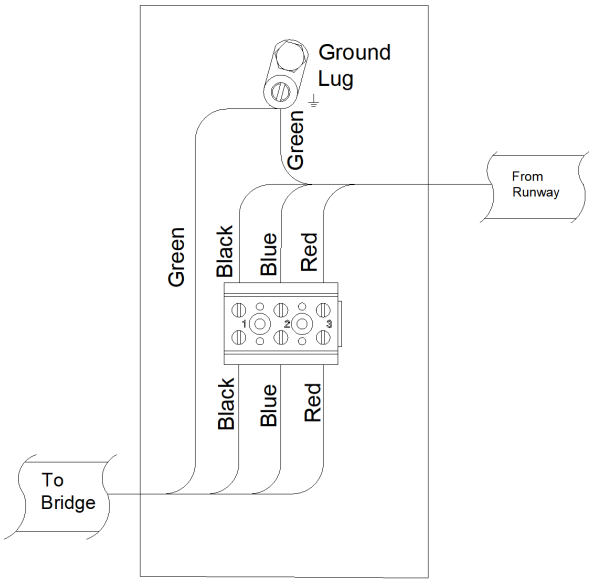
As shown in the figure below, feed the flat cable from the bridge cable festoon, into the cable fitting on the left side of the junction box.



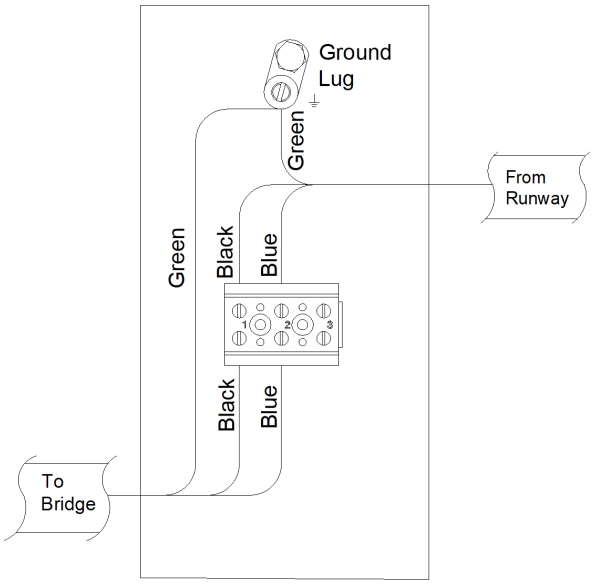
Step 4 Figure Flat cable fitment into the junction box

Step 5: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the figures below.



Step 5 Figure Junction box wiring configurations for 3-phase power – flat cable



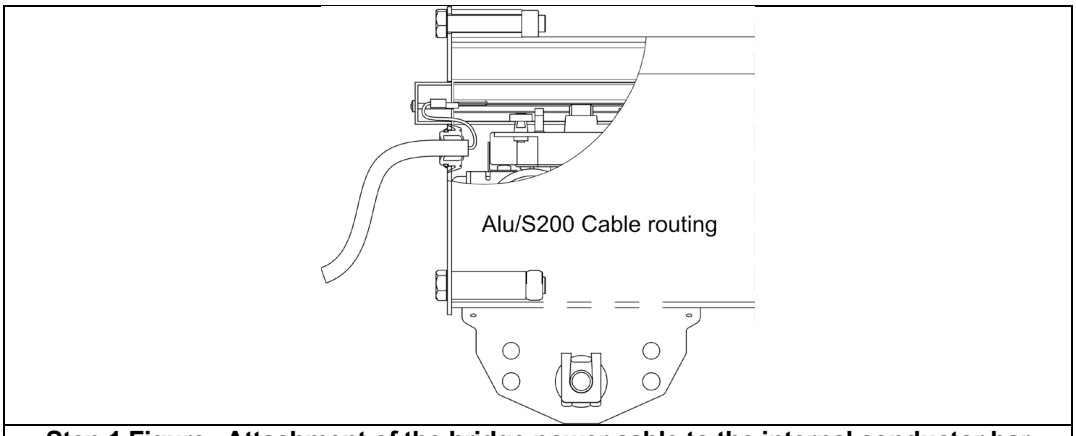
Step 5 Figure Junction box wiring configurations for single-phase power – flat cable

Standard Headroom
Aluminum Profile Single Girder Bridge with Internal Conductor Electrification

Step 1: Attach the power cable to the bridge internal conductor bar

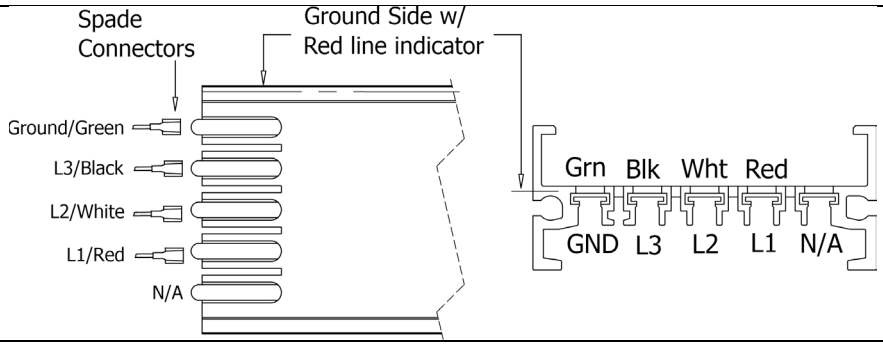
Before proceeding with bridge installation, install the bridge power cable to the bridge internal conductor bar as shown in the figure below.

NOTICE When internal conductor electrification is used on the bridge(s), the power cable that connects the bridge junction box to the internal conductor bar on the bridge **MUST** be installed on the bridge prior to lifting the bridge into position and connecting it to the runway.

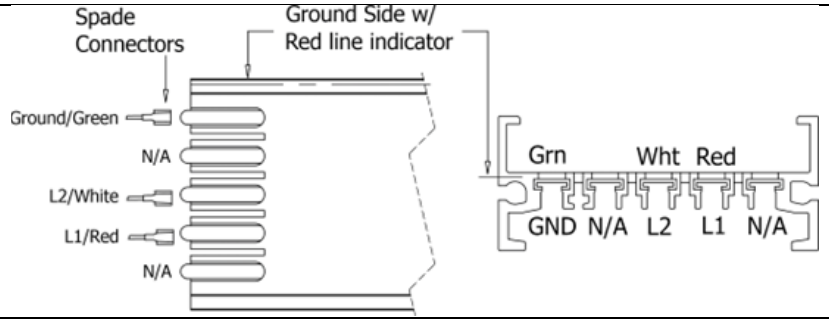


Step 1 Figure Attachment of the bridge power cable to the internal conductor bar

⚠ CAUTION For systems equipped with internal conductor electrification, the ground side of the track is indicated with a sticker label reading “GROUND SIDE” at the end of the track piece.



Wiring connections for 3-phase power

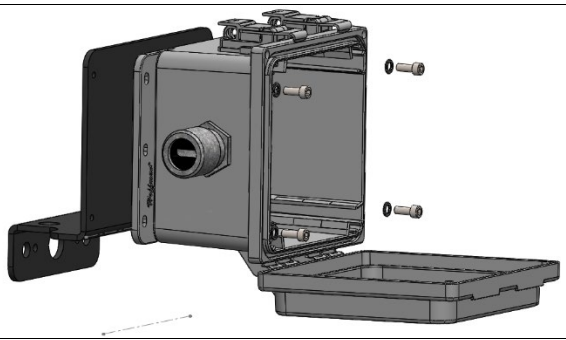


Wiring connections for single-phase power

Step 1 Figure Individual conductor attachments for bridge internal conductor bar

Step 2: Attach the junction box to the universal mounting bracket

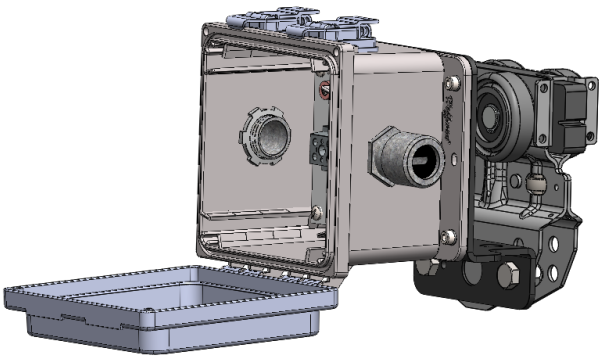
Using the supplied screws (M6x16, Part Number 9091249), and spring washers (M6, Part Number 9012709) attach the junction box to the universal mounting bracket as shown in the figure below.



Step 2 Figure Attachment of the junction box to the universal mounting bracket

Step 3: Attach the junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

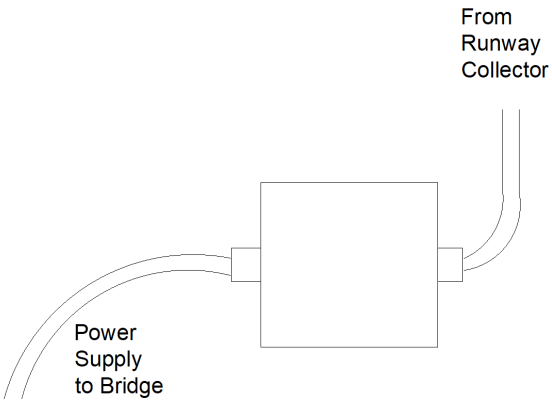


Step 3 Figure Installation of the junction box and bracket assembly onto the end truck trolley

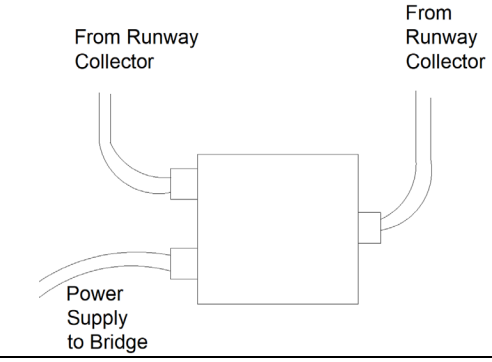
Step 4: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



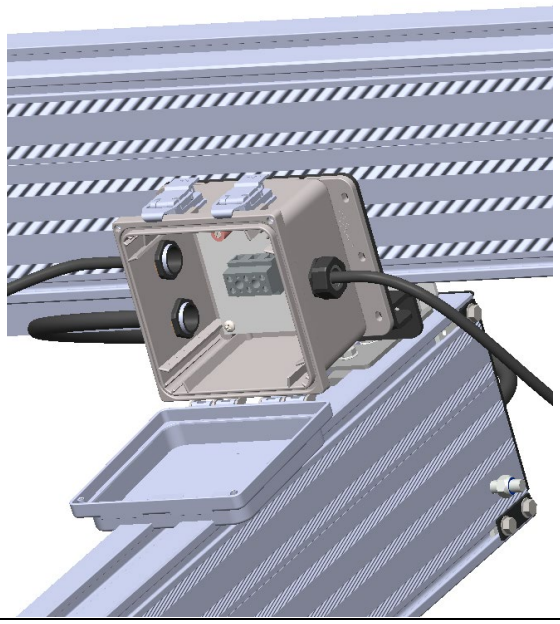
Step 4 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 4 Figure Junction box connection diagrams – ICE dual runway collectorws

Step 5: Connect bridge ICE cable into junction box

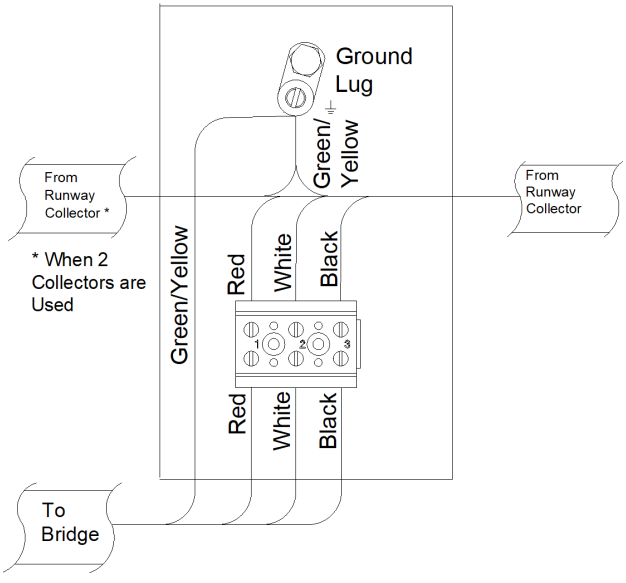
As shown in the image below, feed the already installed ICE power cable from the bridge into the junction box through the cable fitting on the lower left side of the junction box.



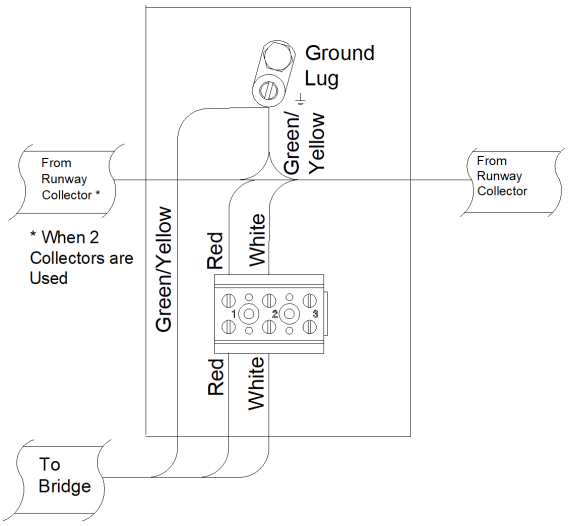
Step 5 Figure Power cable connection between junction box and bridge

Step 6: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the image below.



Step 6 Figure Wiring diagram for 3-phase power



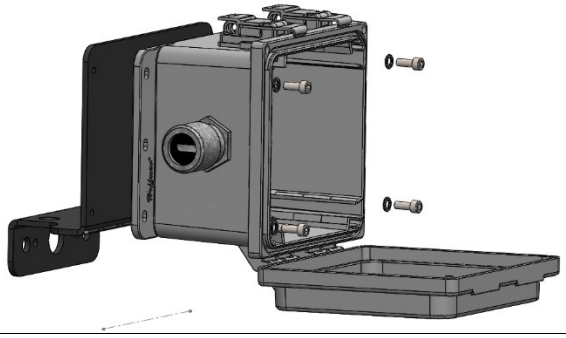
Step 6 Figure Wiring diagram for single-phase power

Standard Headroom
Aluminum Profile Single Girder Bridge with Flat Cable Electrification

NOTICE Before proceeding, verify that the flat cable and flat cable trolleys are installed on the bridge. The following steps for electrification installation cannot be completed unless the flat cable is installed.

Step 1: Attaching junction box to universal mounting bracket

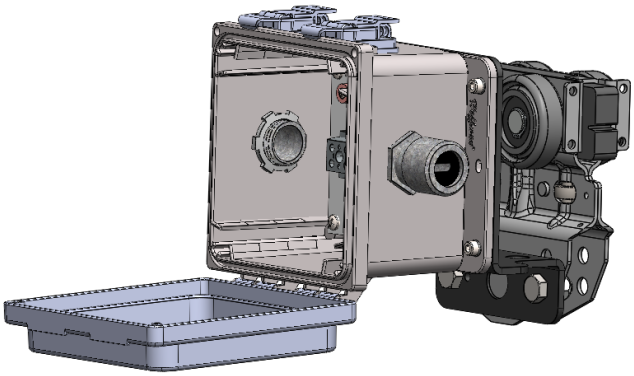
Using the supplied hardware (M6x16, Part Number 9091249),and spring washers (M6, Part Number 9012709), fix the junction box to the universal mounting bracket as shown in the figure below.



Step 1 Figure Attachment of the junction box to the universal mounting bracket

Step 2: Attaching junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

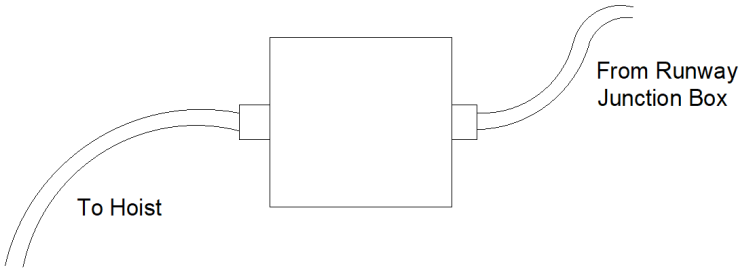


Step 2 Figure Installation of the junction box and bracket assembly onto the end truck trolley

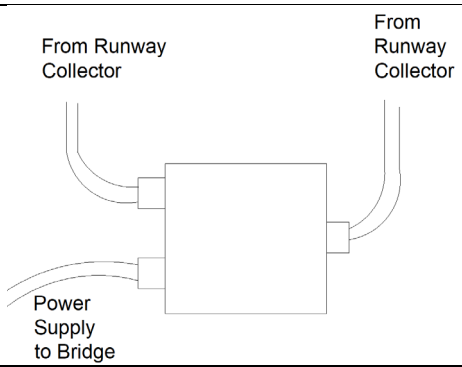
Step 3: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



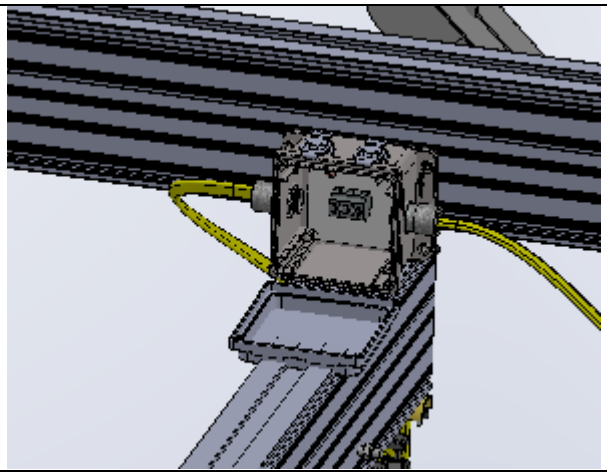
Step 3 Figure Cable fitment into the junction box – flat cable or ICE single collector runway



Step 3 Figure Cable fitment into the junction box – ICE dual runway collectors

Step 4: Connect bridge flat cable into junction box

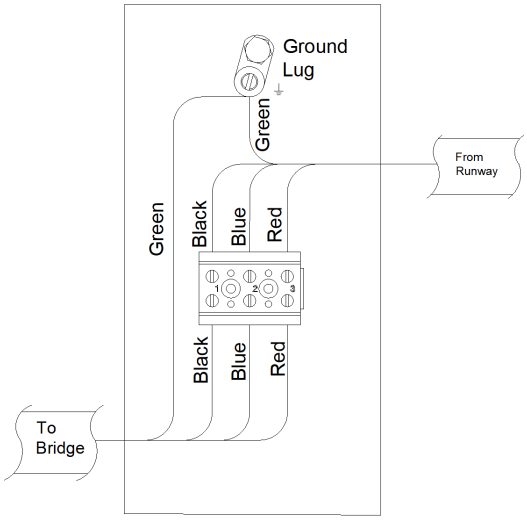
As shown in the figure below, feed the flat cable from the bridge cable festoon, into the cable fitting on the left side of the junction box.



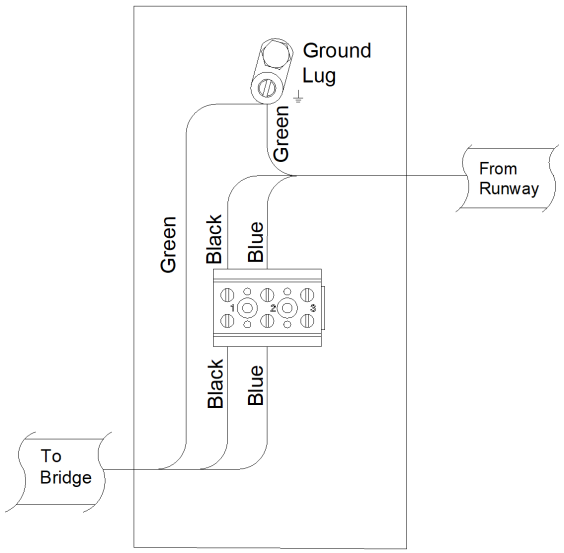
Step 4 Figure Flat cable fitment into the junction box

Step 5: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the figures below.



Step 5 Figure Junction box wiring configurations for 3-phase power



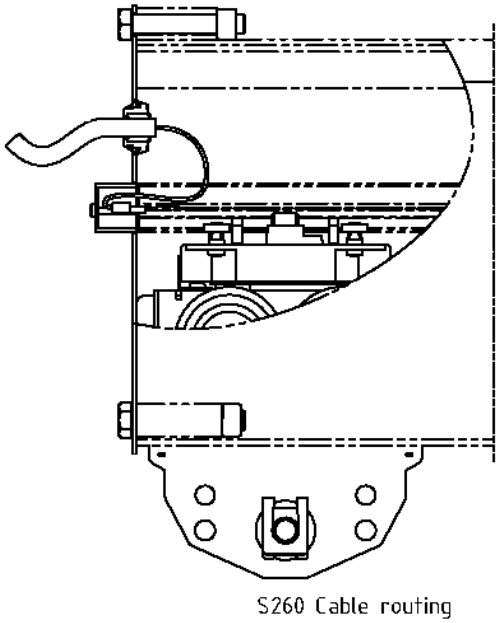
Step 5 Figure Junction box wiring configurations for single-phase power

Standard Headroom
Steel Double Girder Bridge with Internal Conductor Electrification

Step 1: Attach the power cable to the bridge internal conductor bar

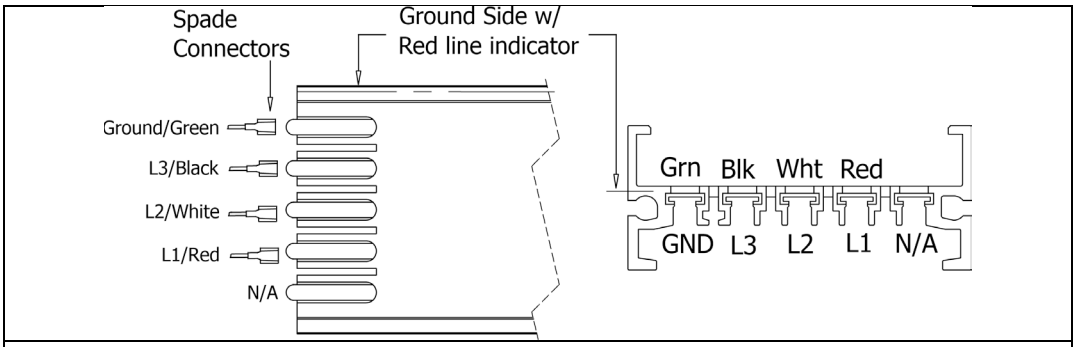
Before proceeding with bridge installation, install the bridge power cable to the bridge internal conductor bar as shown in the figure below.

NOTICE When internal conductor electrification is used on the bridge(s), the power cable that connects the bridge junction box to the internal conductor bar on the bridge **MUST** be installed on the bridge prior to lifting the bridge into position and connecting it to the runway.

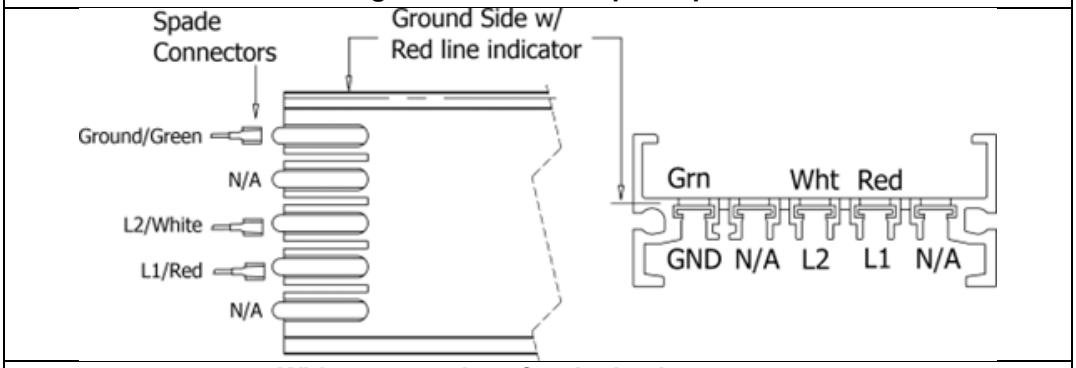


Step 1 Figure Attachment of the bridge power cable to the internal conductor bar

⚠ CAUTION For systems equipped with internal conductor electrification, the ground side of the track is indicated with a sticker label reading “GROUND SIDE” at the end of the track piece.



Wiring connections for 3-phase power

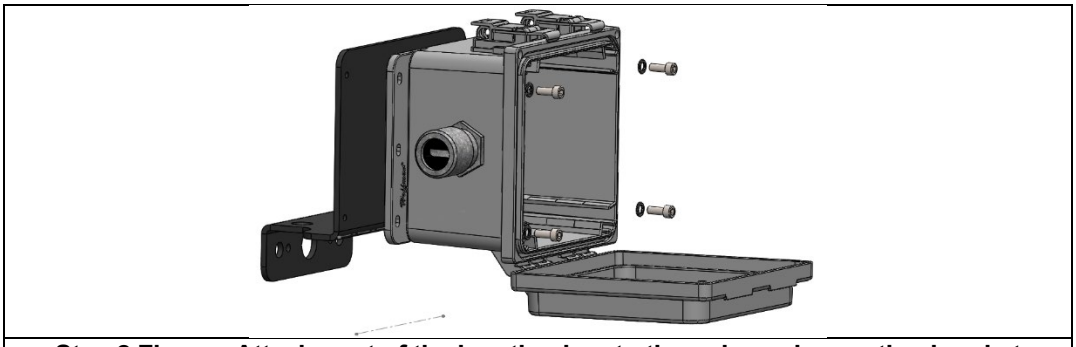


Wiring connections for single-phase power

Step 1 Figure Individual conductor attachments for bridge internal conductor bar

Step 2: Attach the junction box to the universal mounting bracket

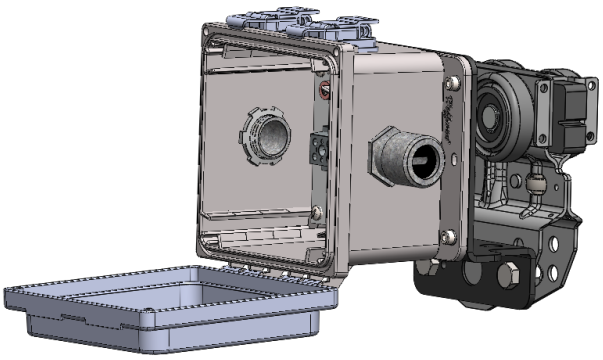
Using the supplied screws (M6x16, Part Number 9091249), and spring washers (M6, Part Number 9012709) attach the junction box to the universal mounting bracket as shown in the figure below.



Step 2 Figure Attachment of the junction box to the universal mounting bracket

Step 3: Attach the junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

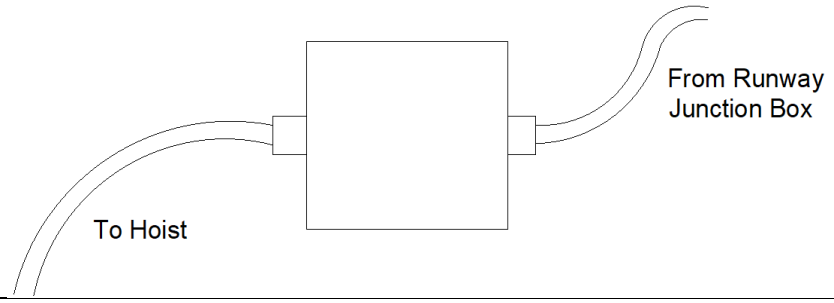


Step 3 Figure Installation of the junction box and bracket assembly onto the end truck trolley

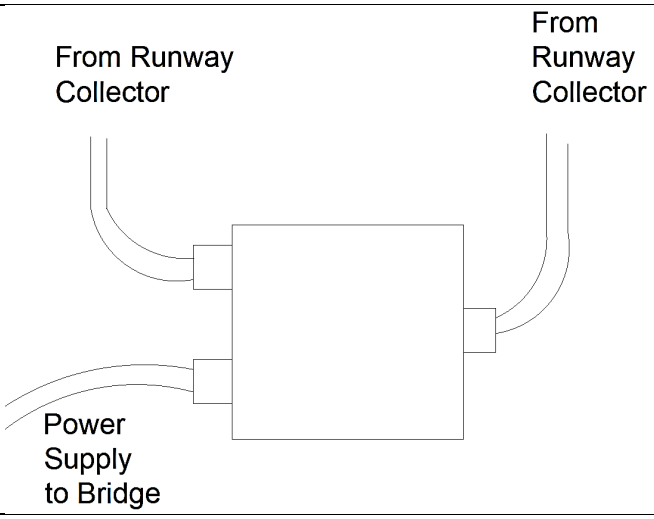
Step 4: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



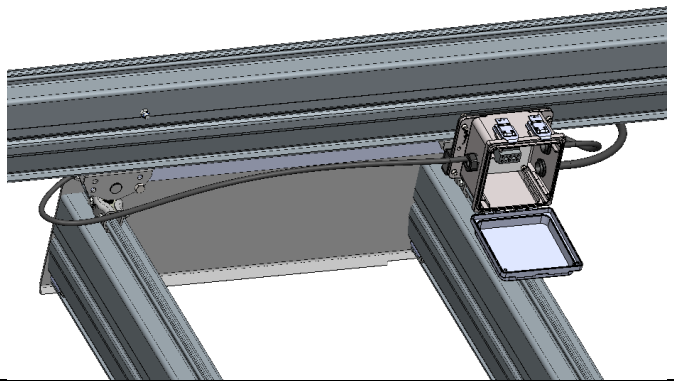
Step 4 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 4 Figure Junction box connection diagrams – ICE dual runway collectors

Step 5: Connect bridge ICE cable into junction box

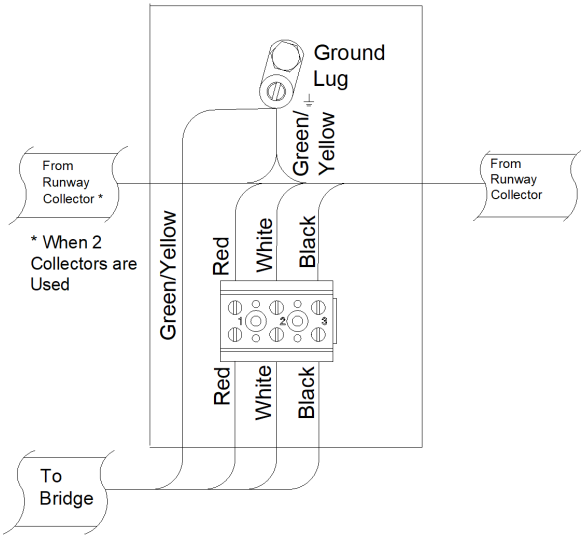
As shown in the image below, feed the already installed ICE power cable from the bridge into the junction box through the cable fitting on the lower left side of the junction box.



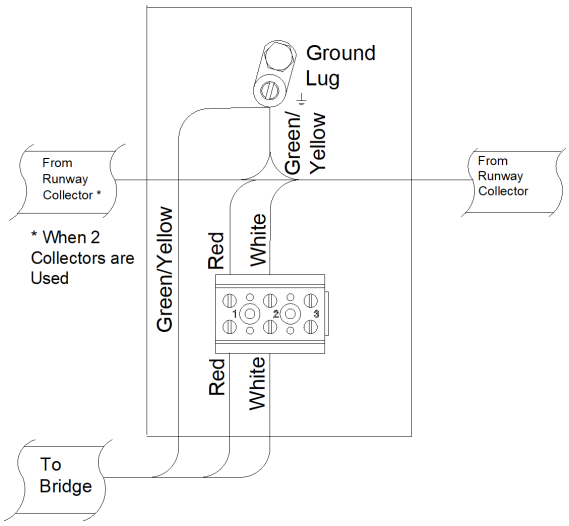
Step 5 Figure Power cable connection between junction box and bridge

Step 6: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the image below.



Step 6 Figure Wiring diagram for 3-phase power



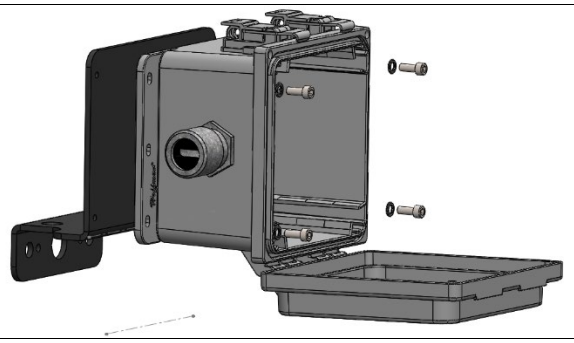
Step 6 Figure Wiring diagram for single-phase power

Standard Headroom
Steel Double Girder Bridge with Flat Cable Electrification

NOTICE Before proceeding, verify that the flat cable and flat cable trolleys are installed on the bridge. The following steps for electrification installation cannot be completed unless the flat cable is installed.

Step 1: Attaching junction box to universal mounting bracket

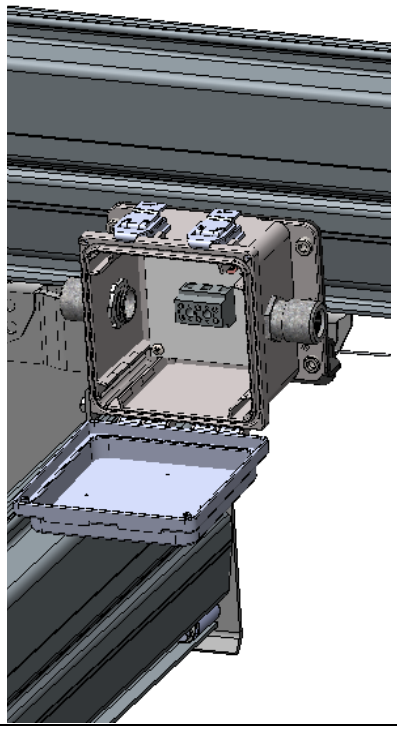
Using the supplied hardware (M6x16, Part Number 9091249),and spring washers (M6, Part Number 9012709), fix the junction box to the universal mounting bracket as shown in the figure below.



Step 1 Figure Attachment of the junction box to the universal mounting bracket

Step 2: Attaching junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

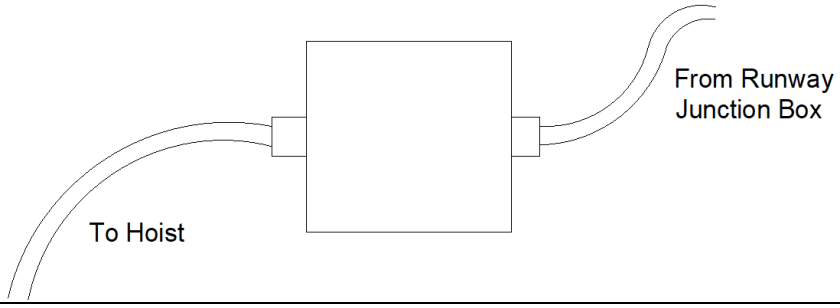


Step 2 Figure Installation of the junction box and bracket assembly onto the end truck trolley

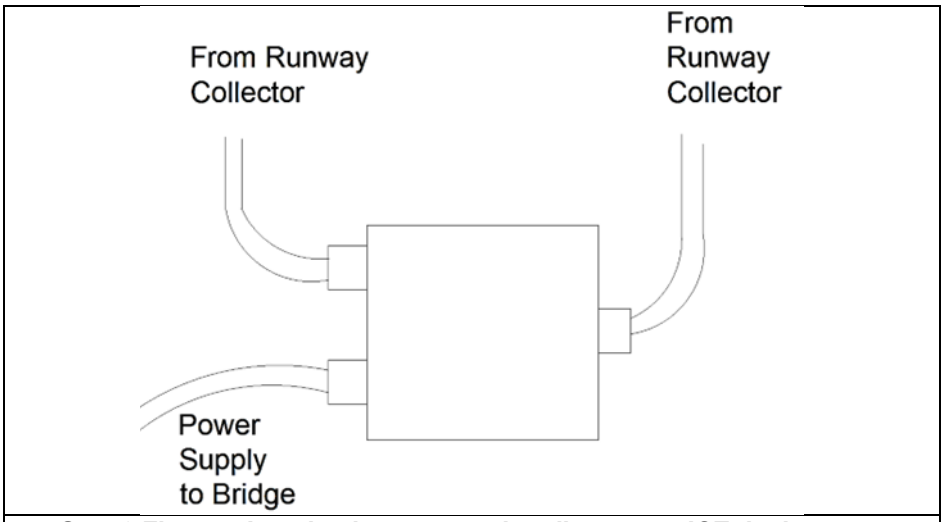
Step 3: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



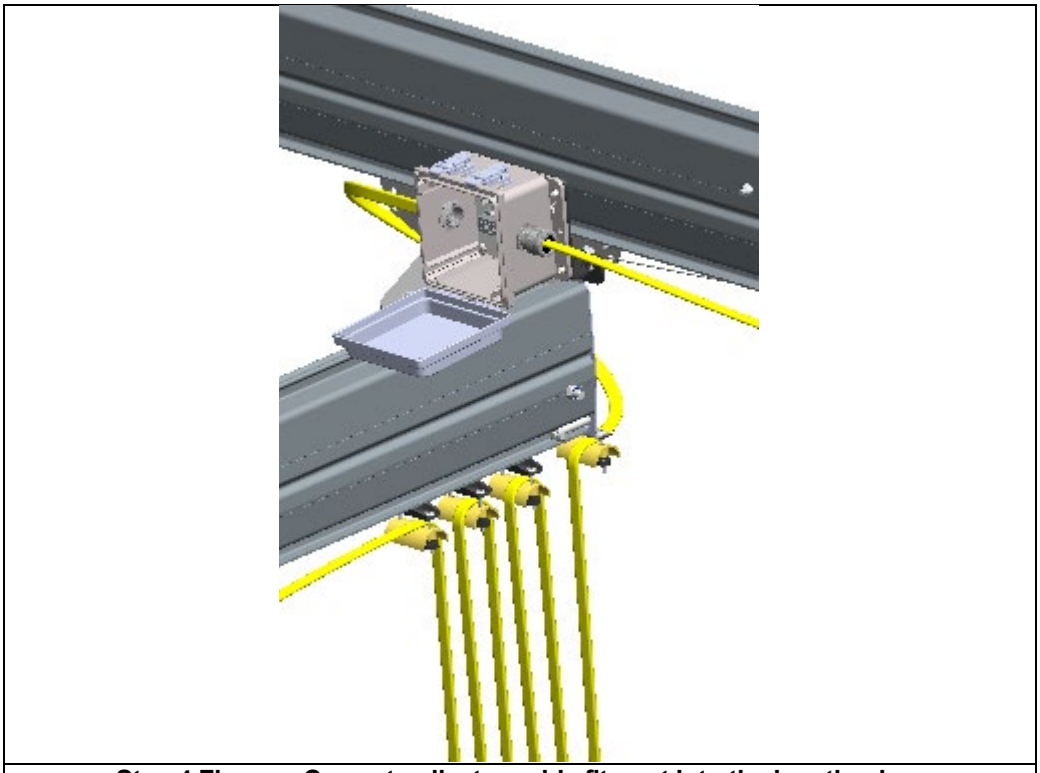
Step 3 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 3 Figure Junction box connection diagrams – ICE dual runway collectors

Step 4: Connect bridge flat cable into junction box

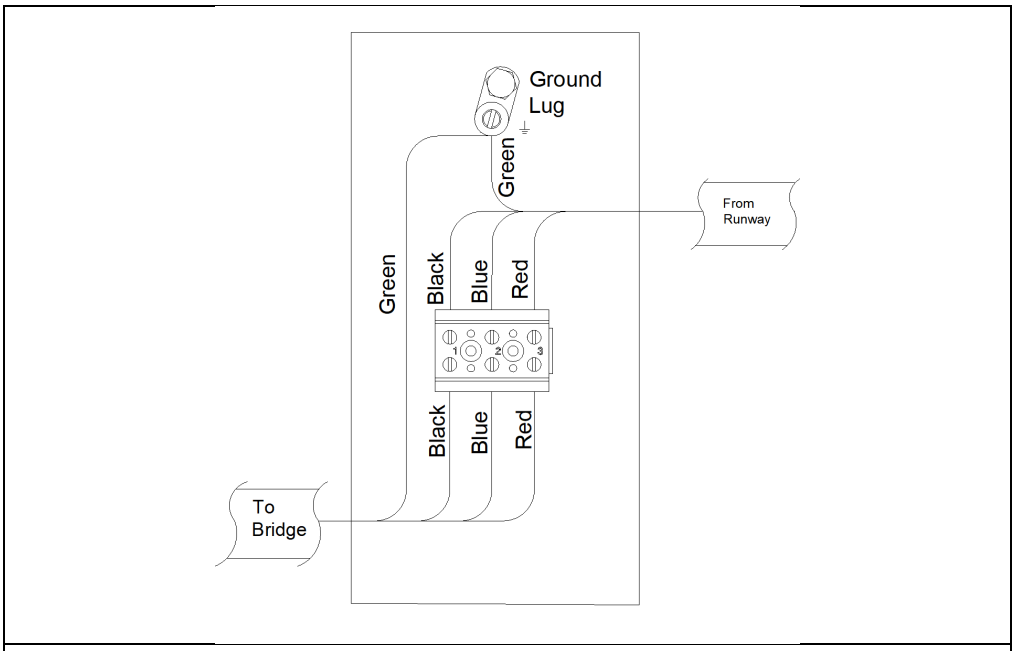
As shown in the figure below, feed the flat cable from the bridge cable festoon, into the cable fitting on the left side of the junction box.



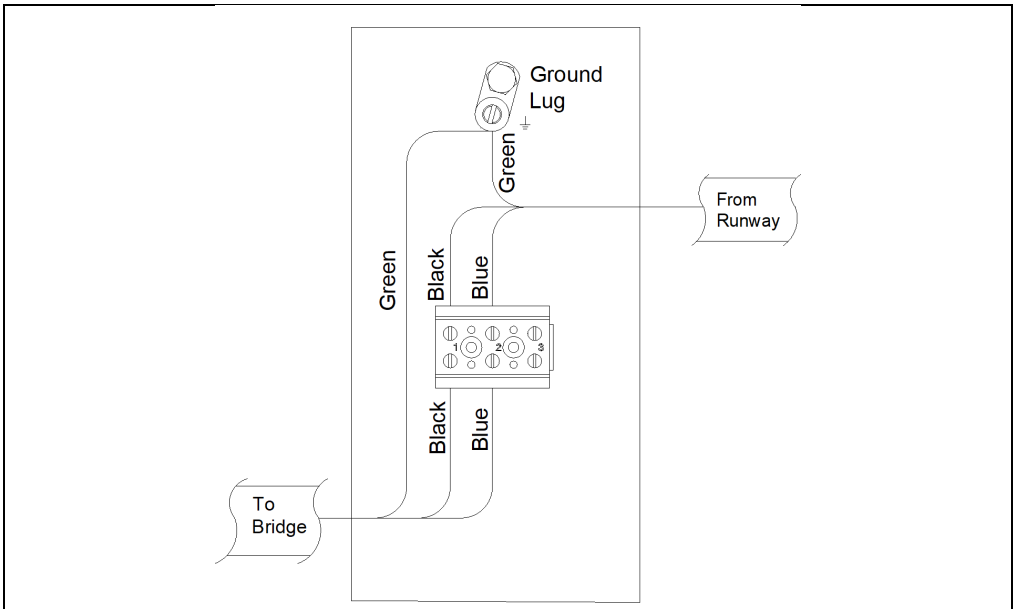
Step 4 Figure Current collector cable fitment into the junction box

Step 5: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the figures below.



Step 5 Figure Junction box wiring configurations for 3-phase power



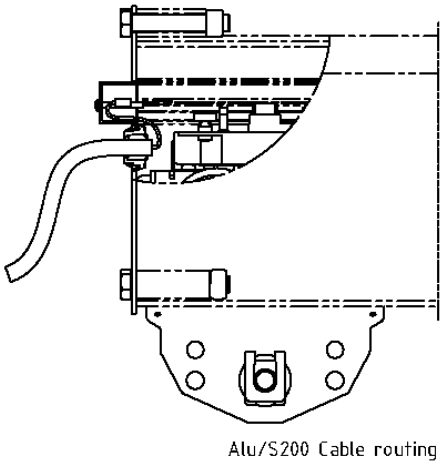
Step 5 Figure Junction box wiring configurations for single-phase power

Standard Headroom
Aluminum Profile Double Girder Bridge with Internal Conductor Electrification

Step 1: Attach the power cable to the bridge internal conductor bar

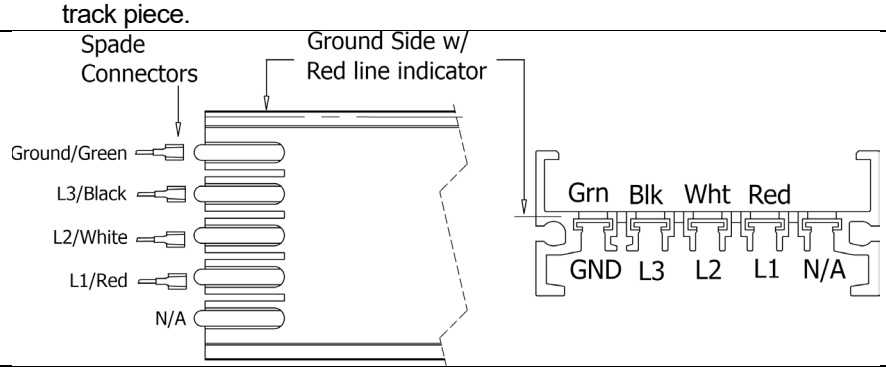
Before proceeding with bridge installation, install the bridge power cable to the bridge internal conductor bar as shown in the figure below.

NOTICE When internal conductor electrification is used on the bridge(s), the power cable that connects the bridge junction box to the internal conductor bar on the bridge **MUST** be installed on the bridge prior to lifting the bridge into position and connecting it to the runway.

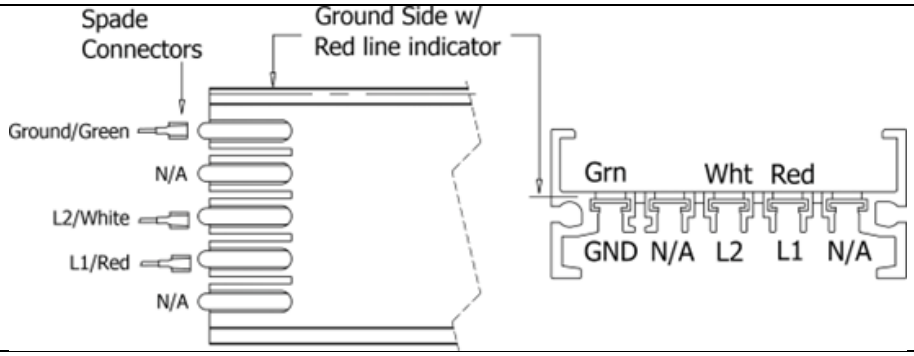


Step 1 Figure Attachment of the bridge power cable to the internal conductor bar

⚠ CAUTION For systems equipped with internal conductor electrification, the ground side of the track is indicated with a sticker label reading “GROUND SIDE” at the end of the track piece.



Wiring connections for 3 phase power

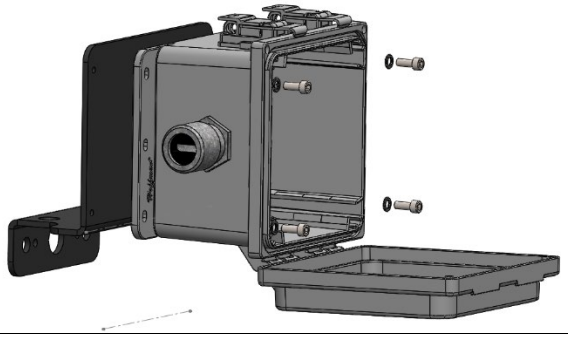


Wiring connections for single-phase power

Step 1 Figure Individual conductor attachments for bridge internal conductor bar

Step 2: Attach the junction box to the universal mounting bracket

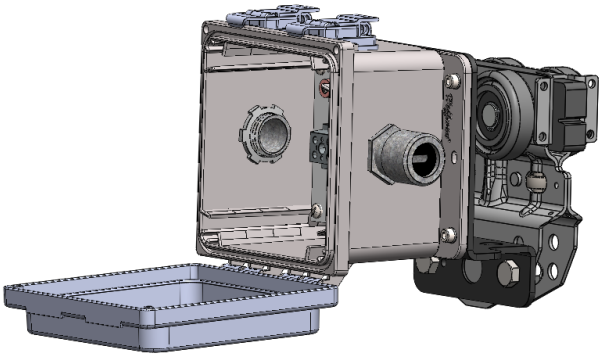
Using the supplied screws (M6x16, Part Number 9091249), and spring washers (M6, Part Number 9012709) attach the junction box to the universal mounting bracket as shown in the figure below.



Step 2 Figure Attachment of the junction box to the universal mounting bracket

Step 3: Attach the junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

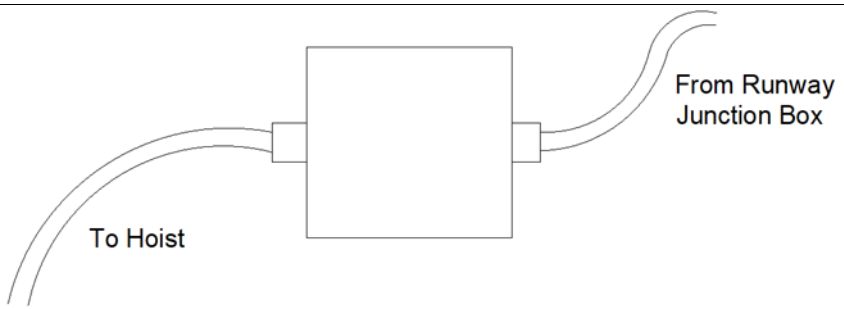


Step 3 Figure Installation of the junction box and bracket assembly onto the end truck trolley

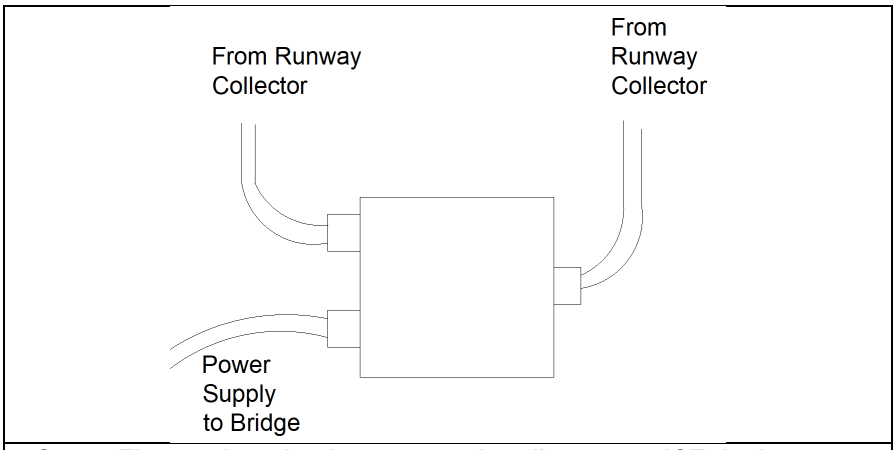
Step 4: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



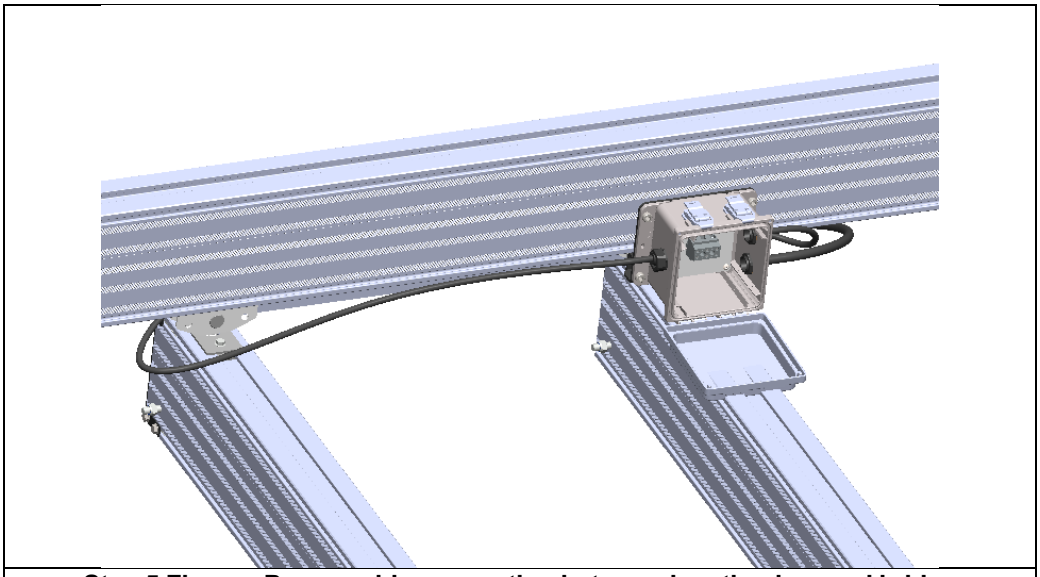
Step 4 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 4 Figure Junction box connection diagrams – ICE dual runway collectors

Step 5: Connect bridge ICE cable into junction box

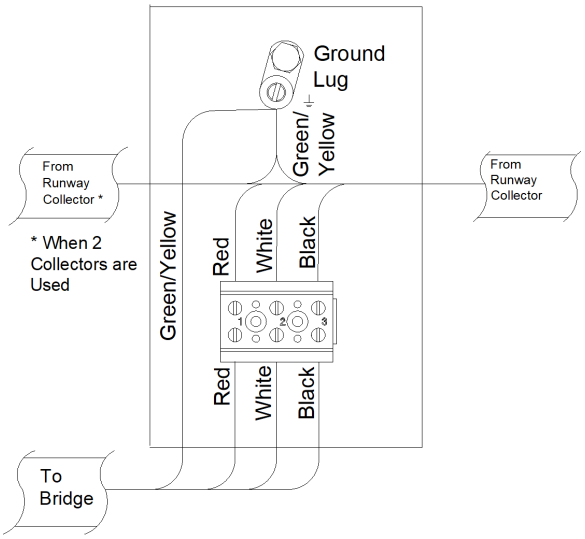
As shown in the image below, feed the already installed ICE power cable from the bridge into the junction box through the cable fitting on the lower left side of the junction box.



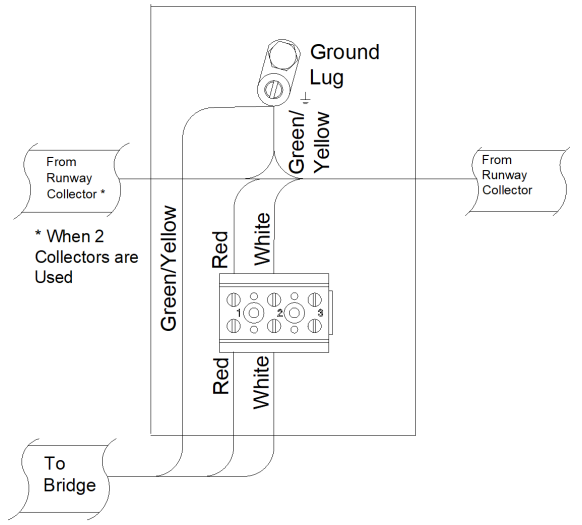
Step 5 Figure Power cable connection between junction box and bridge

Step 6: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the image below.



Step 6 Figure Wiring diagram for 3-phase power



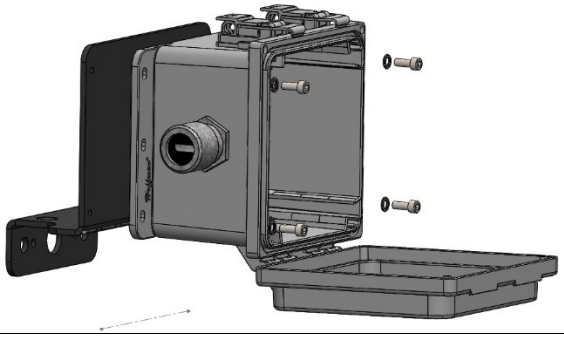
Step 6 Figure Wiring diagram for single-phase power

Standard Headroom
Aluminum Double Girder Bridge with Flat Cable Electrification

NOTICE Before proceeding, verify that the flat cable and flat cable trolleys are installed on the bridge. The following steps for electrification installation cannot be completed unless the flat cable is installed.

Step 1: Attaching junction box to universal mounting bracket

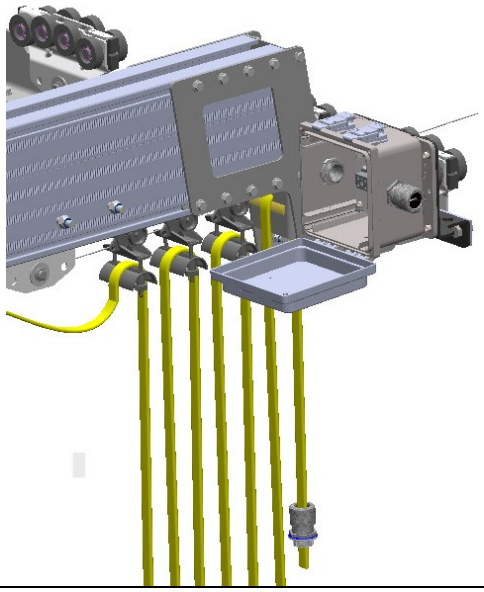
Using the supplied hardware (M6x16, Part Number 9091249),and spring washers (M6, Part Number 9012709), fix the junction box to the universal mounting bracket as shown in the figure below.



Step 1 Figure Attachment of the junction box to the universal mounting bracket

Step 2: Attaching junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

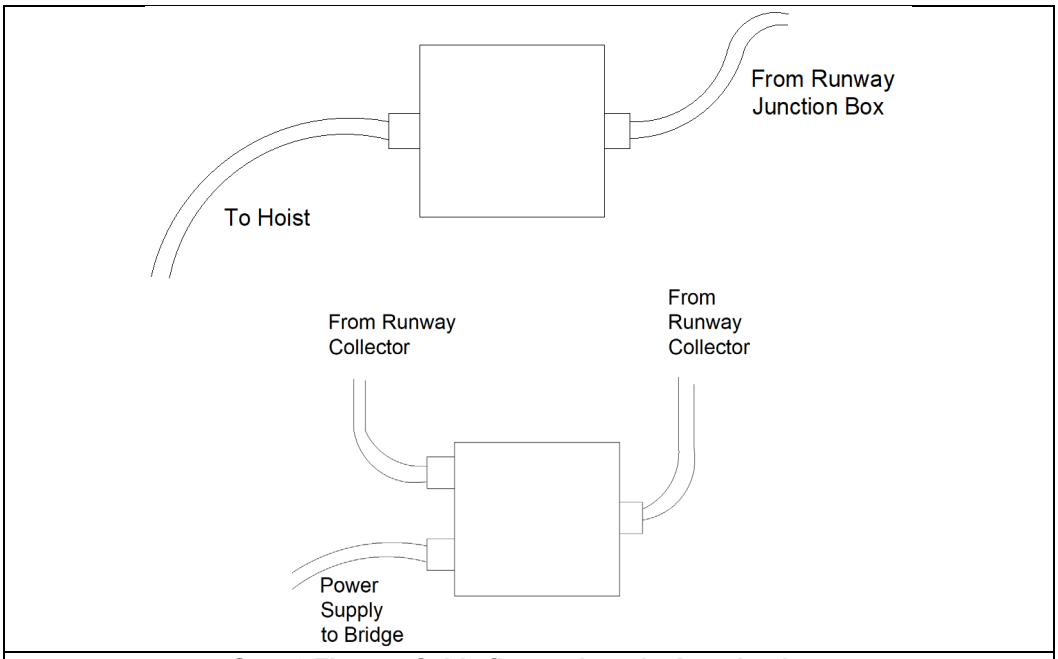


Step 2 Figure Installation of the junction box and bracket assembly onto the end truck trolley

Step 3: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

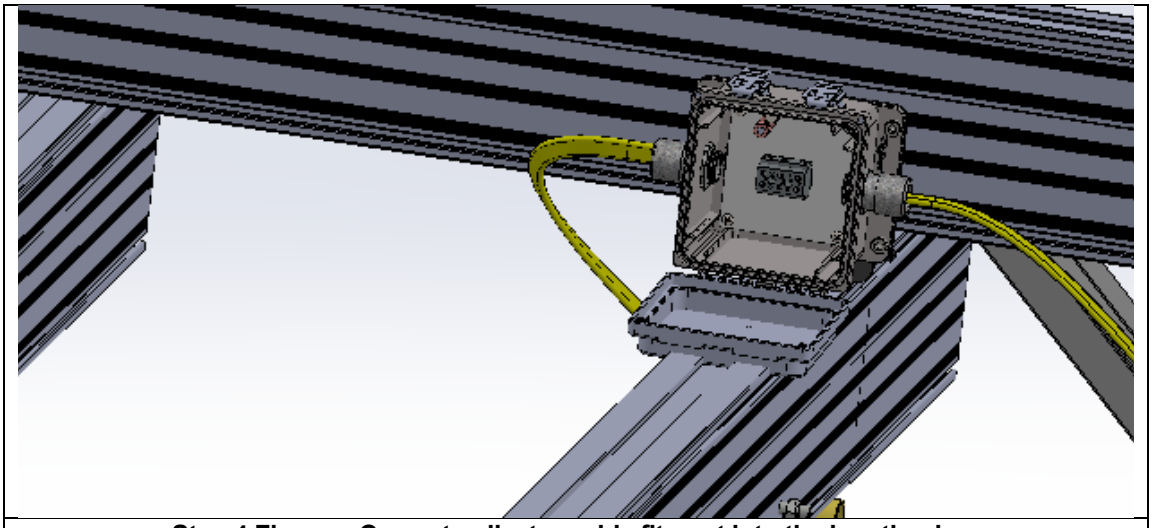
NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



Step 3 Figure Cable fitment into the junction box

Step 4: Connect bridge flat cable into junction box

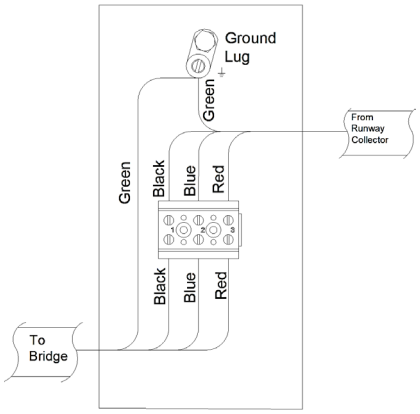
As shown in the figure below, feed the flat cable from the bridge cable festoon, into the cable fitting on the left side of the junction box.



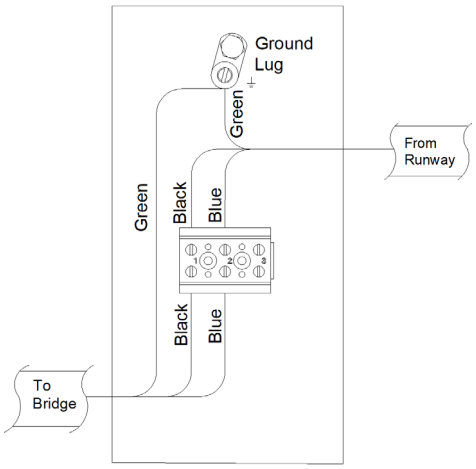
Step 4 Figure Current collector cable fitment into the junction box

Step 5: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the figures below.



Step 5 Figure Junction box wiring configurations for 3-phase power



Step 5 Figure Junction box wiring configurations for 1-phase power

Low Headroom Bridge Types

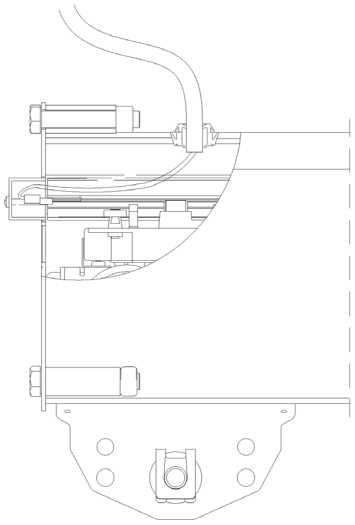
Low Headroom

Steel Single Girder Bridge with Internal Conductor Electrification

Step 1: Attach the power cable to the bridge internal conductor bar

Before proceeding with bridge installation, install the bridge power cable to the bridge internal conductor bar as shown in the figure below.

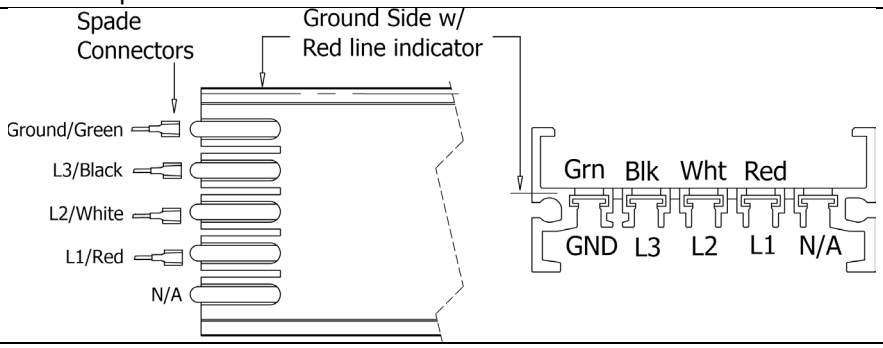
NOTICE When internal conductor electrification is used on the bridge(s), the power cable that connects the bridge junction box to the internal conductor bar on the bridge **MUST** be installed on the bridge prior to lifting the bridge into position and connecting it to the runway.



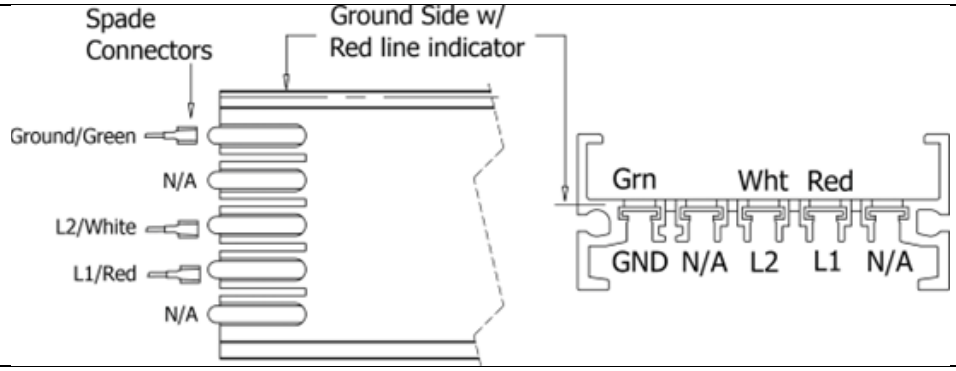
Alu/S200 Cable routing

Step 1 Figure Attachment of the bridge power cable to the internal conductor bar

⚠ CAUTION For systems equipped with internal conductor electrification, the ground side of the track is indicated with a sticker label reading “GROUND SIDE” at the end of the track piece.



Wiring connections for 3-phase power

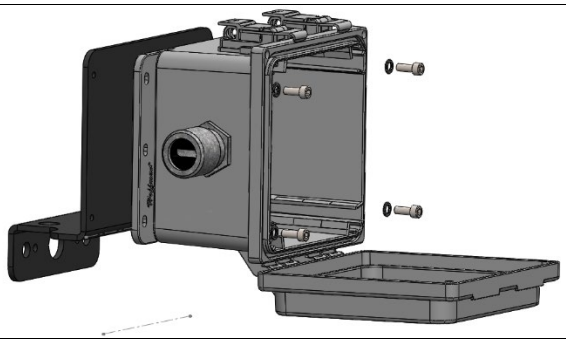


Wiring connections for single-phase power

Step 1 Figure Individual conductor attachments for bridge internal conductor bar

Step 2: Attach the junction box to the universal mounting bracket

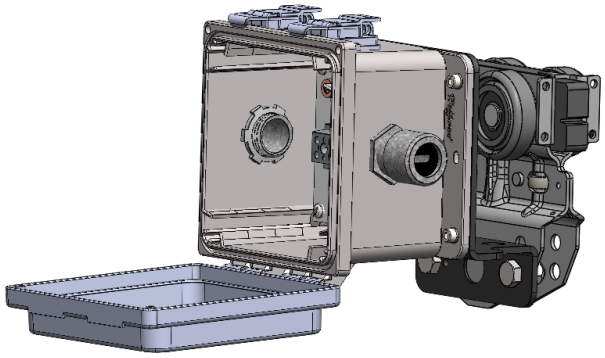
Using the supplied screws (M6x16, Part Number 9091249), and spring washers (M6, Part Number 9012709) attach the junction box to the universal mounting bracket as shown in the figure below.



Step 2 Figure Attachment of the junction box to the universal mounting bracket

Step 3: Attach the junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

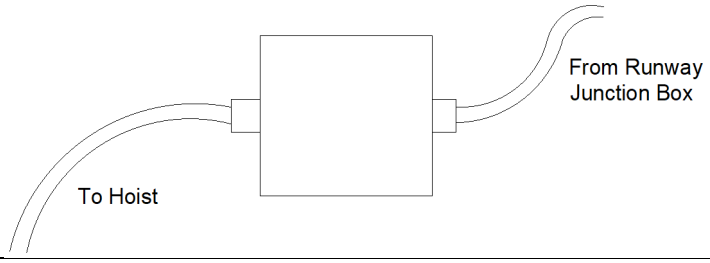


Step 3 Figure Installation of the junction box and bracket assembly onto the end truck trolley

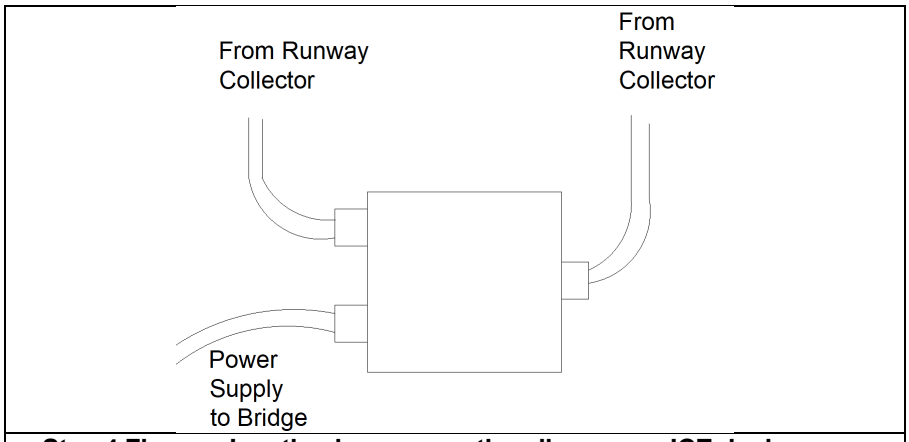
Step 4: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



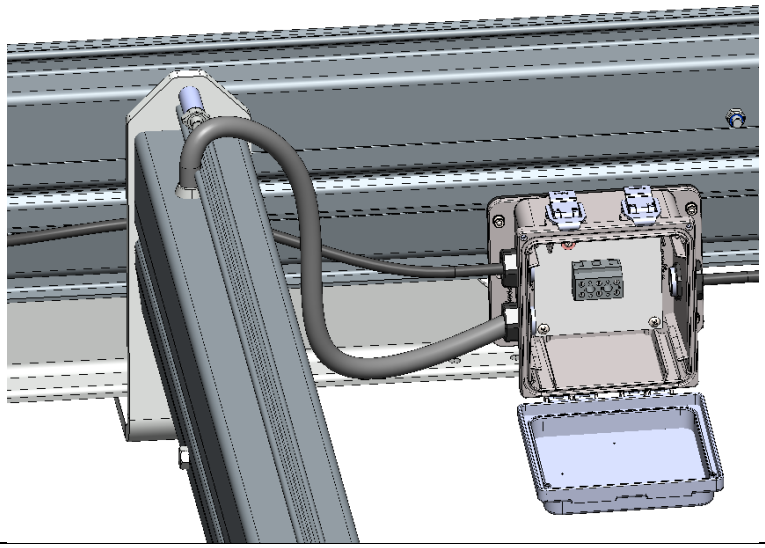
Step 4 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 4 Figure Junction box connection diagrams – ICE dual runway collectors

Step 5: Connect bridge ICE cable into junction box

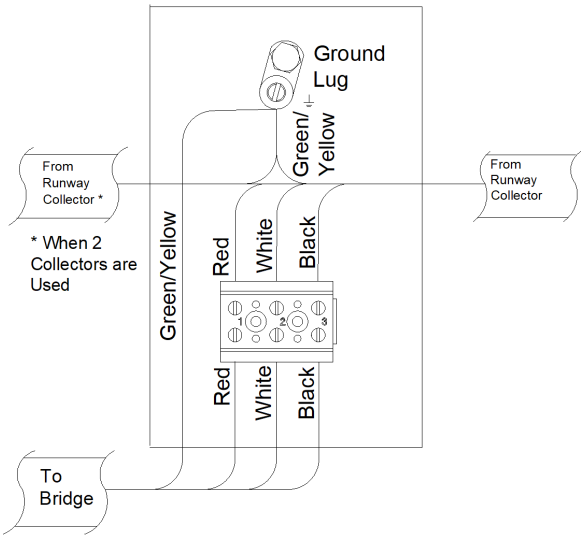
As shown in the image below, feed the already installed ICE power cable from the bridge into the junction box through the cable fitting on the lower left side of the junction box.



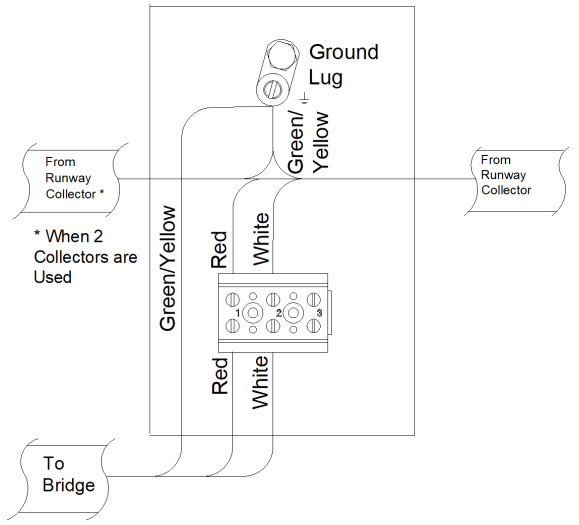
Step 5 Figure Power cable connection between junction box and bridge

Step 6: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the image below.



Step 6 Figure Wiring diagram for 3-phase power



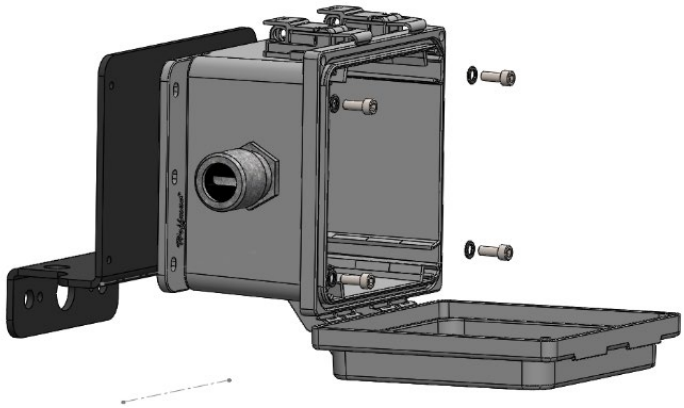
Step 6 Figure Wiring diagram for 1-phase power

Low Headroom
Steel Single Girder Bridge with Flat Cable

NOTICE Before proceeding, verify that the flat cable and flat cable trolleys are installed on the bridge. The following steps for electrification installation cannot be completed unless the flat cable is installed.

Step 1: Attaching junction box to universal mounting bracket

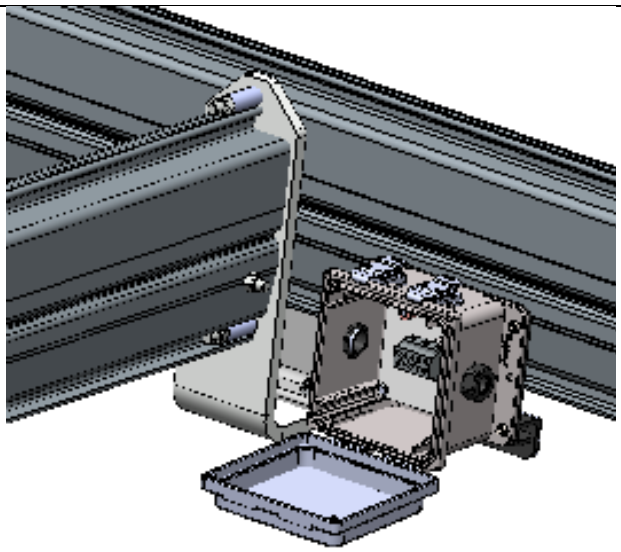
Using the supplied hardware (M6x16, Part Number 9091249),and spring washers (M6, Part Number 9012709), fix the junction box to the universal mounting bracket as shown in the figure below.



Step 1 Figure Attachment of the junction box to the universal mounting bracket

Step 2: Attaching junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

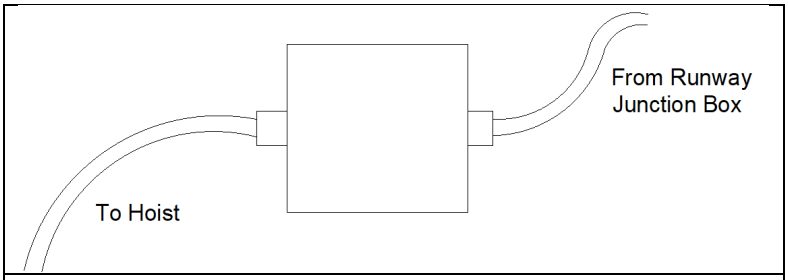


Step 2 Figure Installation of the junction box and bracket assembly onto the end truck trolley

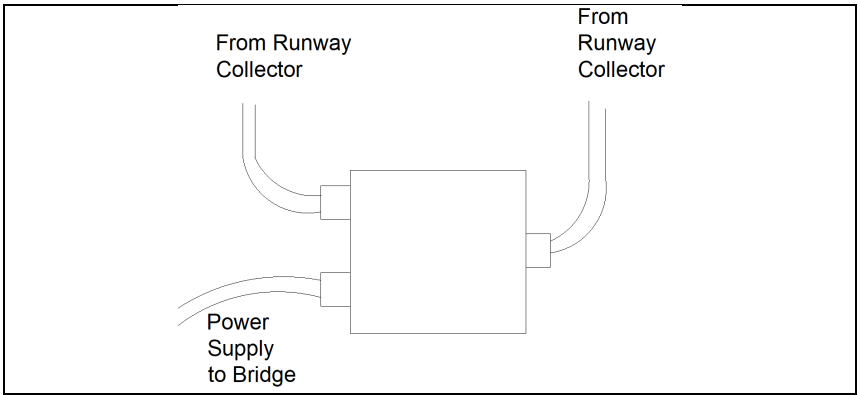
Step 3: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



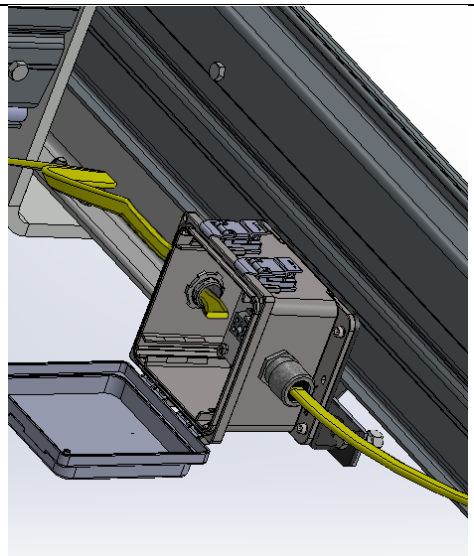
Step 3 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 3 Figure Junction box connection diagrams – ICE dual runway collectors

Step 4: Connect bridge flat cable into junction box

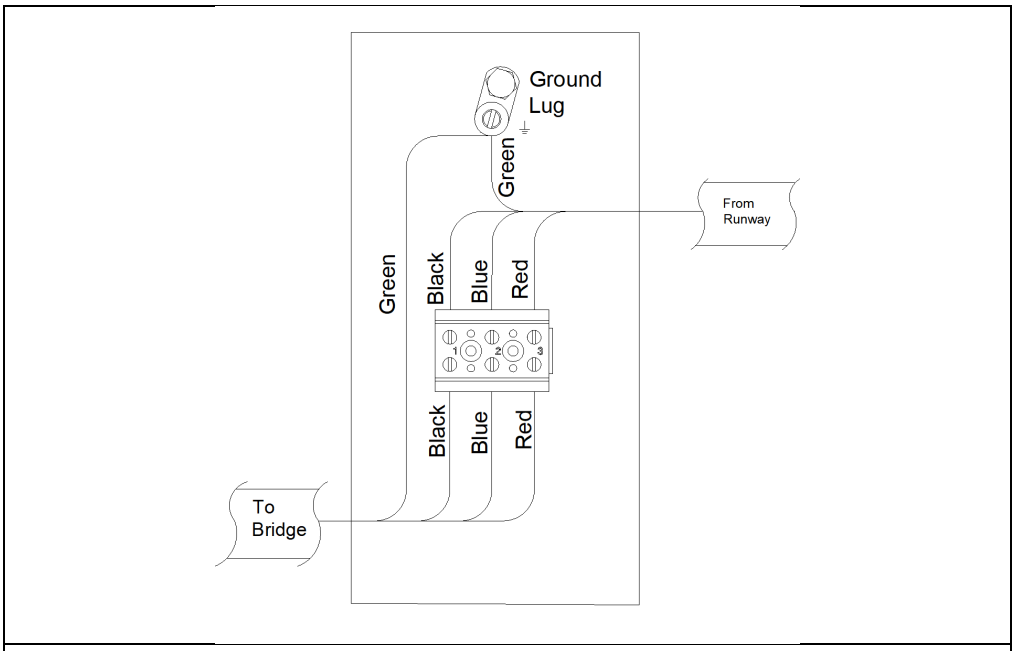
As shown in the figure below, feed the flat cable from the bridge cable festoon, into the cable fitting on the left side of the junction box.



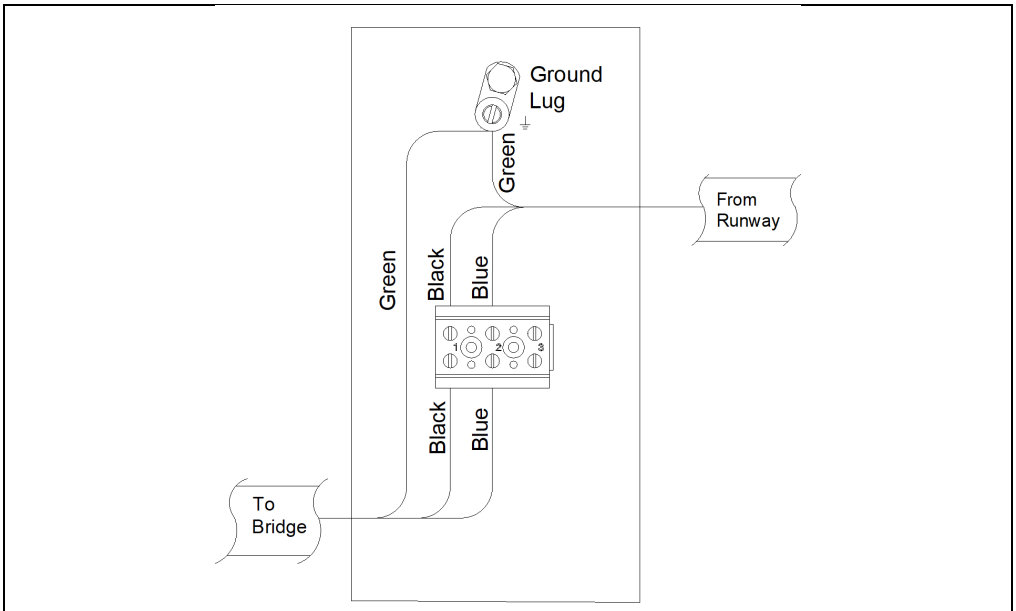
Step 4 Figure Bridge junction box wiring diagram

Step 5: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the figures below.



Step 5 Figure Junction box wiring configurations for 3-phase power



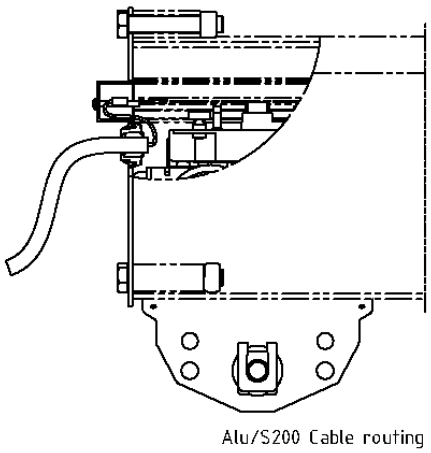
Step 5 Figure Junction box wiring configurations for single-phase power

Low Headroom
Aluminum Single Girder Bridge with Internal Conductor Electrification

Step 1: Attach the power cable to the bridge internal conductor bar

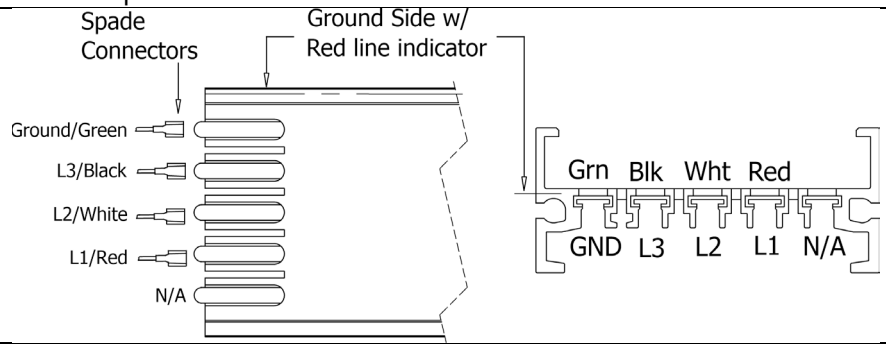
Before proceeding with bridge installation, install the bridge power cable to the bridge internal conductor bar as shown in the figure below.

NOTICE When internal conductor electrification is used on the bridge(s), the power cable that connects the bridge junction box to the internal conductor bar on the bridge **MUST** be installed on the bridge prior to lifting the bridge into position and connecting it to the runway.

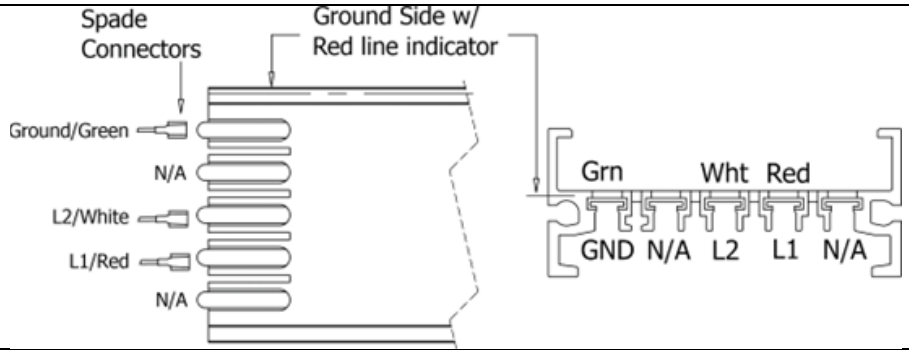


Step 1 Figure Attachment of the bridge power cable to the internal conductor bar

⚠ CAUTION For systems equipped with internal conductor electrification, the ground side of the track is indicated with a sticker label reading “GROUND SIDE” at the end of the track piece.



Wiring connections for 3-phase power

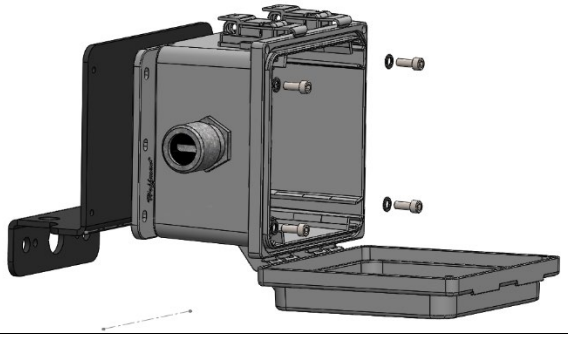


Wiring connections for single-phase power

Step 1 Figure Individual conductor attachments for bridge internal conductor bar

Step 2: Attach the junction box to the universal mounting bracket

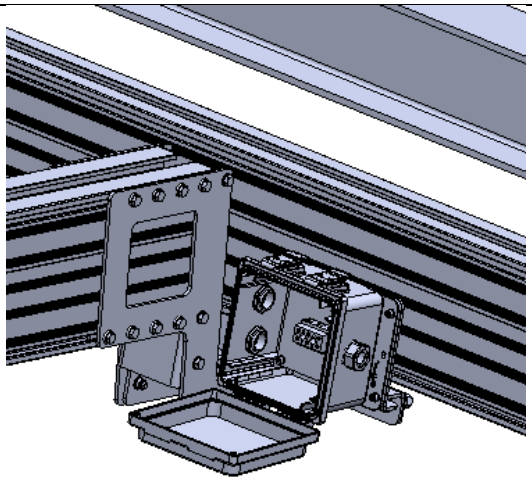
Using the supplied screws (M6x16, Part Number 9091249), and spring washers (M6, Part Number 9012709) attach the junction box to the universal mounting bracket as shown in the figure below.



Step 2 Figure Attachment of the junction box to the universal mounting bracket

Step 3: Attach the junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

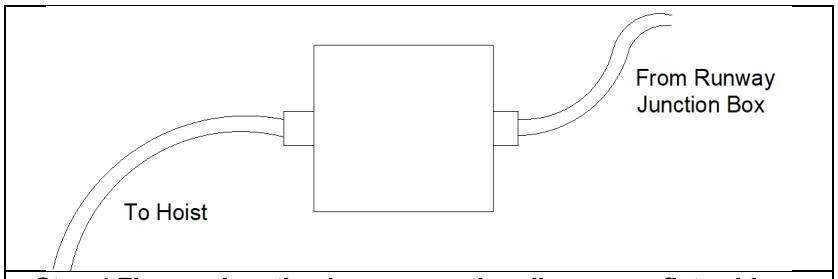


Step 3 Figure Installation of the junction box and bracket assembly onto the end truck trolley

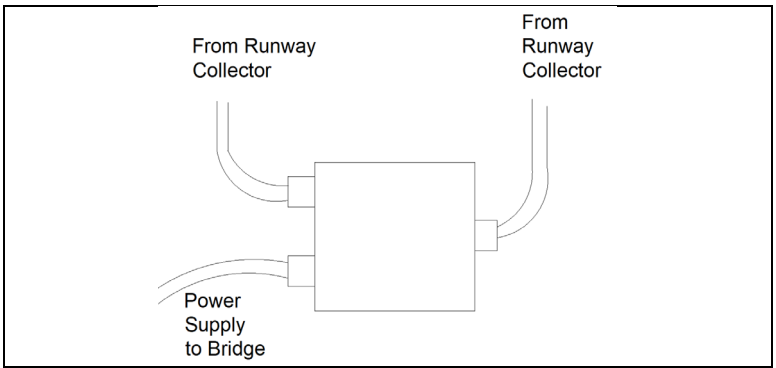
Step 4: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



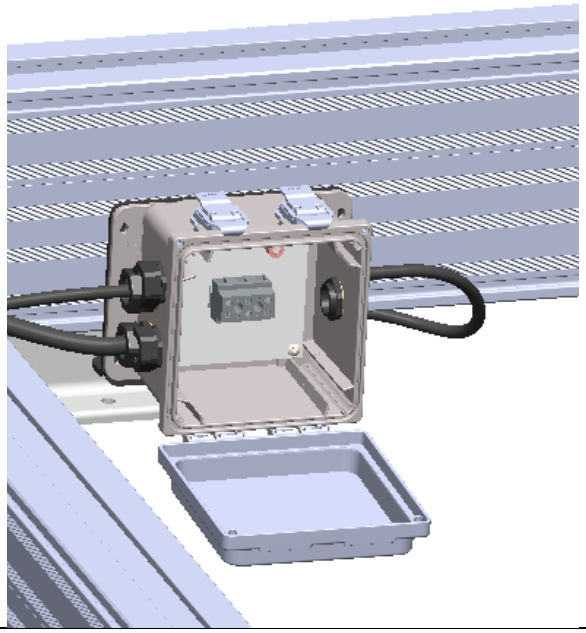
Step 4 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 4 Figure Junction box connection diagrams – ICE dual runway collectors

Step 5: Connect bridge ICE cable into junction box

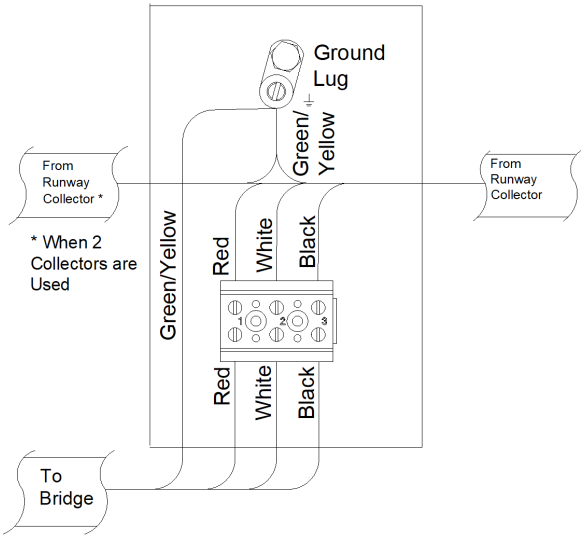
As shown in the image below, feed the already installed ICE power cable from the bridge into the junction box through the cable fitting on the lower left side of the junction box.



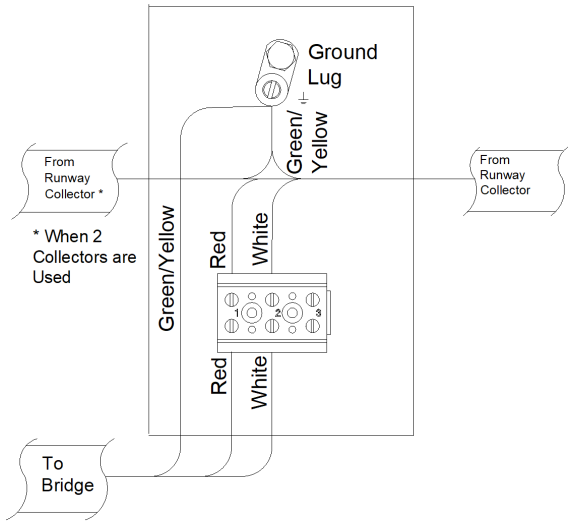
Step 5 Figure Power cable connection between junction box and bridge

Step 6: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the image below.



Step 6 Figure Wiring diagram for 3-phase power



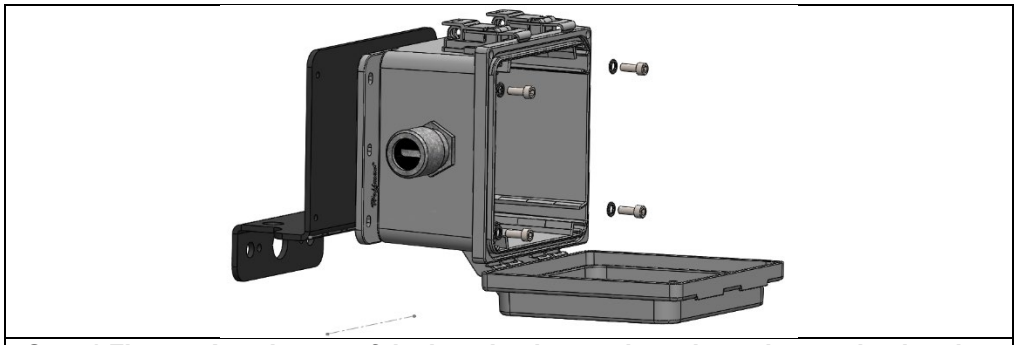
Step 6 Figure Wiring diagram for single-phase power

Low Headroom
Aluminum Single Girder Bridge with Flat Cable

NOTICE Before proceeding, verify that the flat cable and flat cable trolleys are installed on the bridge. The following steps for electrification installation cannot be completed unless the flat cable is installed.

Step 1: Attaching junction box to universal mounting bracket

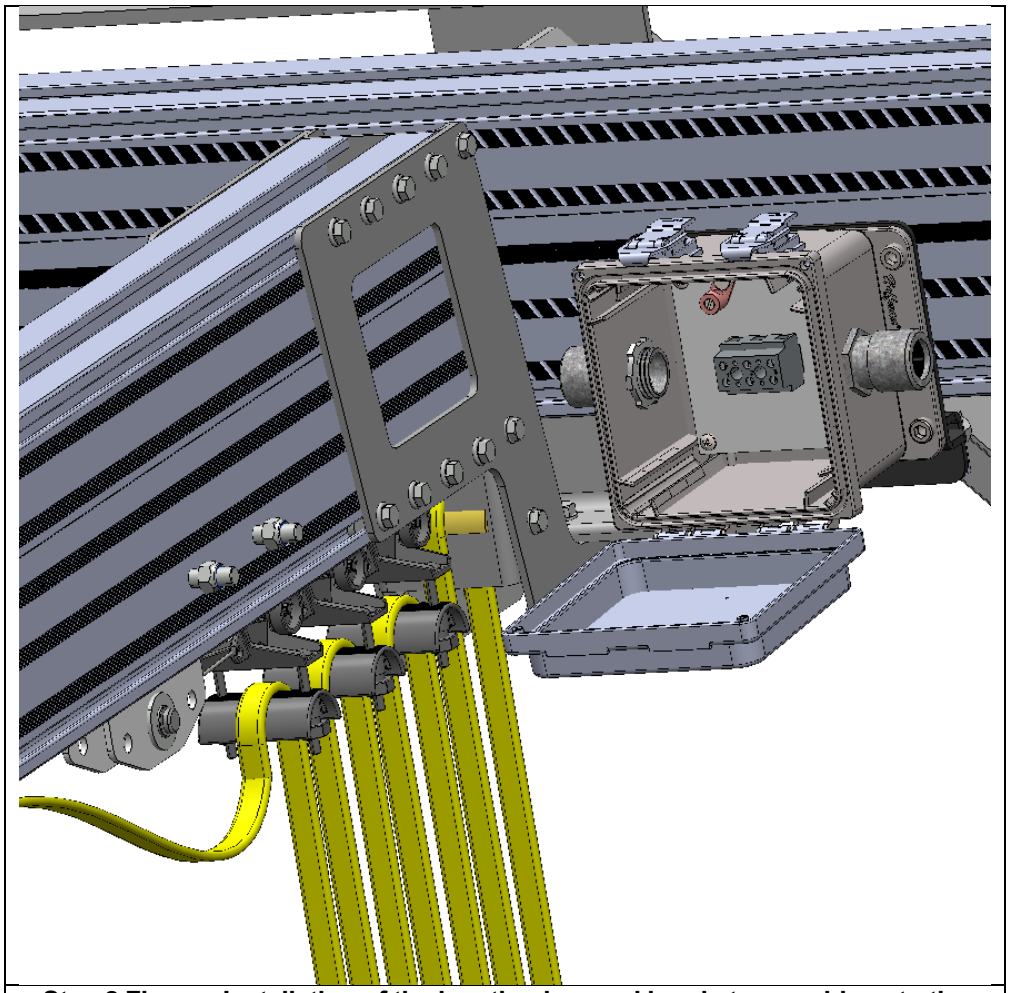
Using the supplied hardware (M6x16, Part Number 9091249),and spring washers (M6, Part Number 9012709), fix the junction box to the universal mounting bracket as shown in the figure below.



Step 1 Figure Attachment of the junction box to the universal mounting bracket

Step 2: Attaching junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511), attach the junction box and bracket assembly to the trolley using the hardware provided, as shown in the figure below.

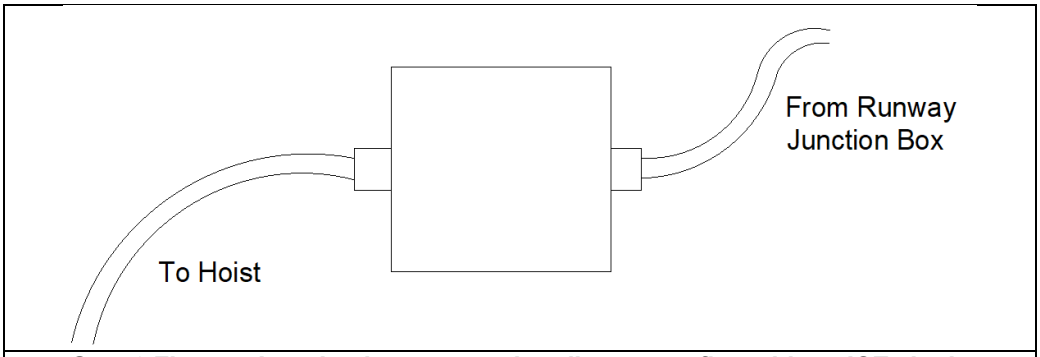


Step 2 Figure Installation of the junction box and bracket assembly onto the end truck trolley

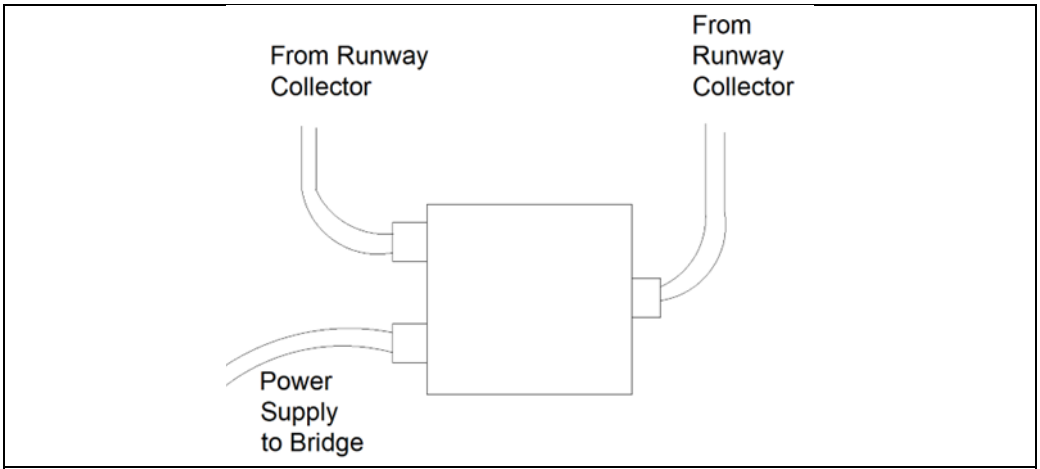
Step 3: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



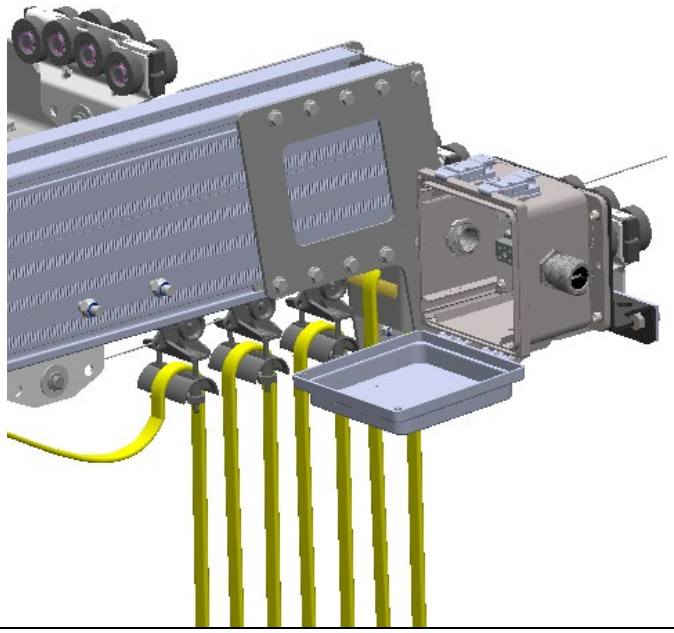
Step 3 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 4 Figure Junction box connection diagrams – ICE dual runway collectors

Step 4: Connect bridge flat cable into junction box

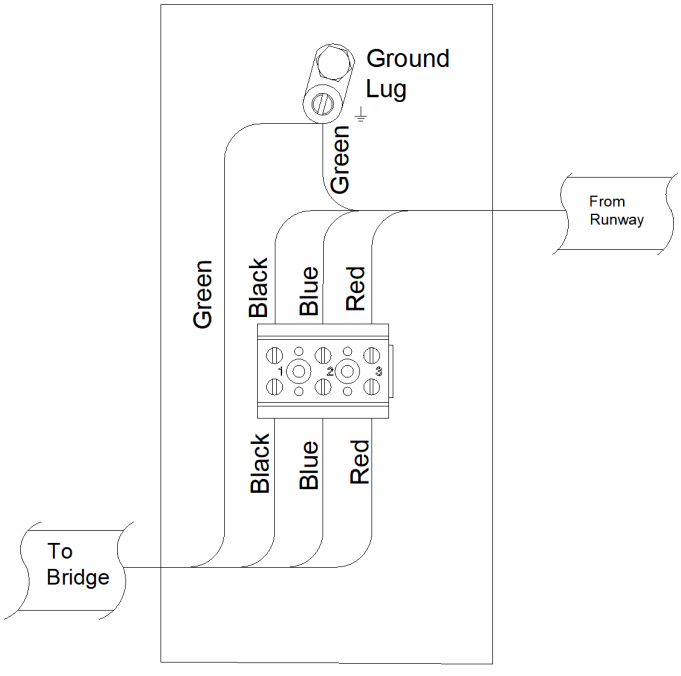
As shown in the figure below, feed the flat cable from the bridge cable festoon, into the cable fitting on the left side of the junction box.



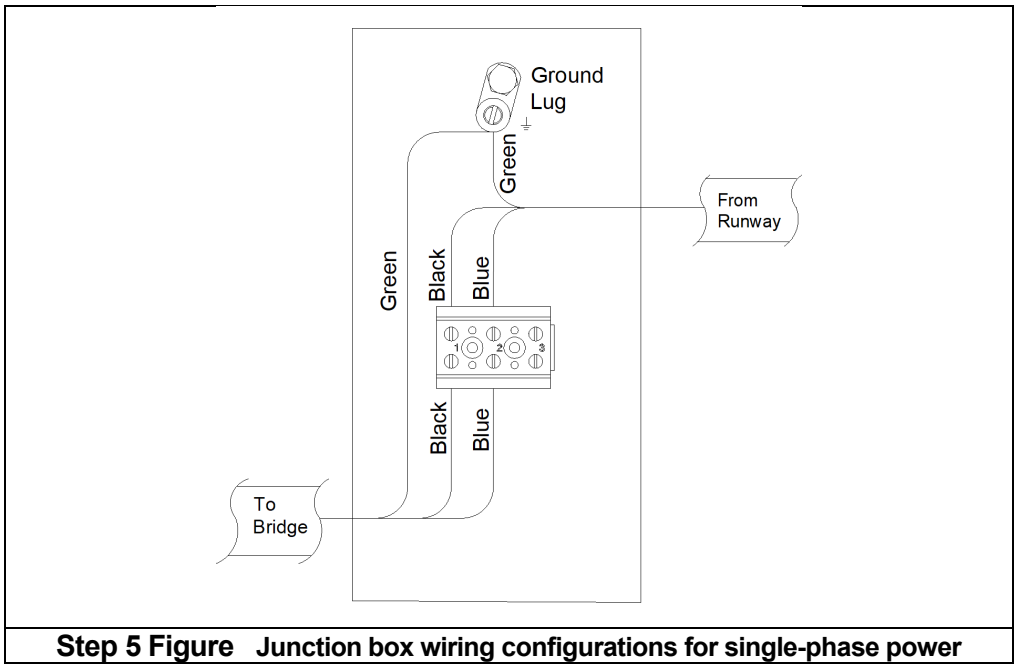
Step 4 Figure Bridge junction box wiring

Step 5: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the figures below.



Step 5 Figure Junction box wiring configurations for 3-phase power



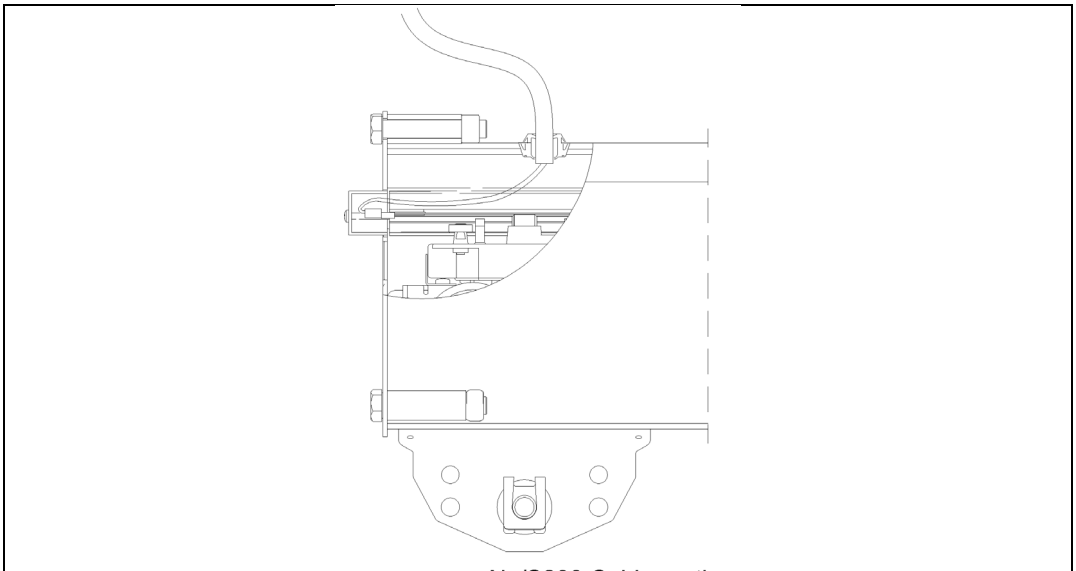
Step 5 Figure Junction box wiring configurations for single-phase power

Low Headroom
Steel Double Girder Bridge with Internal Conductor Electrification

Step 1: Attach the power cable to the bridge internal conductor bar

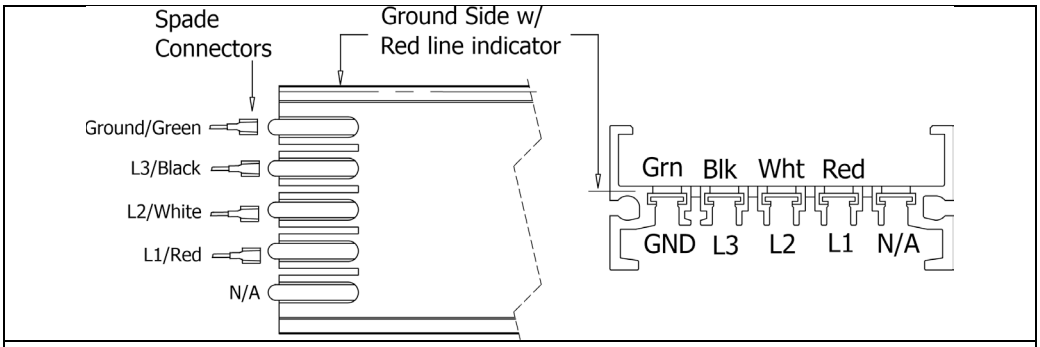
Before proceeding with bridge installation, install the bridge power cable to the bridge internal conductor bar as shown in the figure below.

NOTICE When internal conductor electrification is used on the bridge(s), the power cable that connects the bridge junction box to the internal conductor bar on the bridge **MUST** be installed on the bridge prior to lifting the bridge into position and connecting it to the runway.

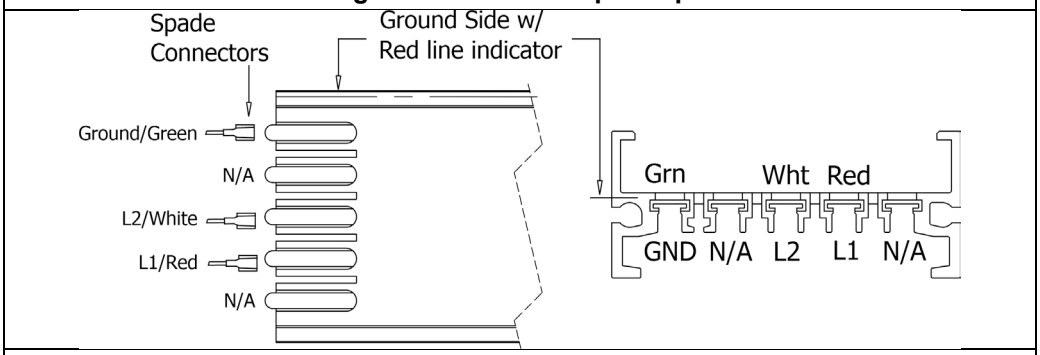


Step 1 Figure Attachment of the bridge power cable to the internal conductor bar

⚠ CAUTION For systems equipped with internal conductor electrification, the ground side of the track is indicated with a sticker label reading “GROUND SIDE” at the end of the track piece.



Wiring connections for 3-phase power

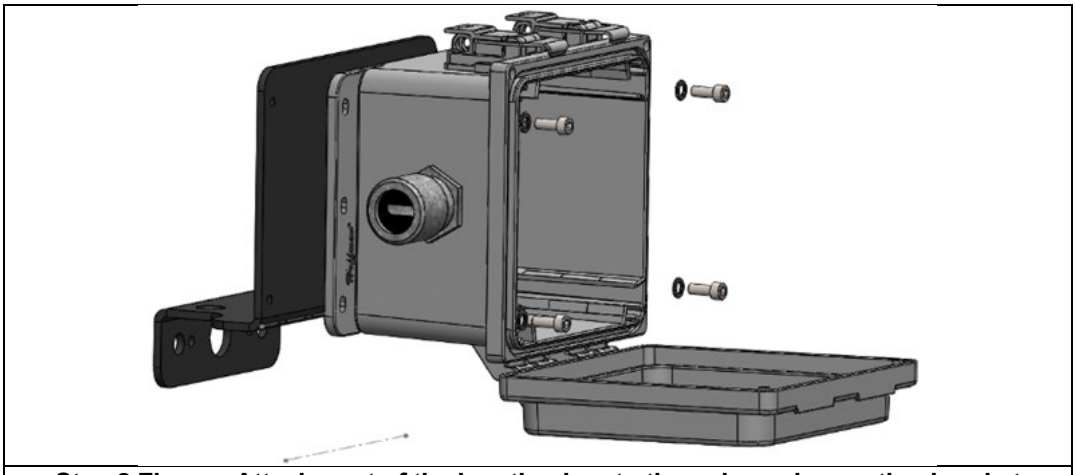


Wiring connections for single-phase power

Step 1 Figure Individual conductor attachments for bridge internal conductor bar

Step 2: Attach the junction box to the universal mounting bracket

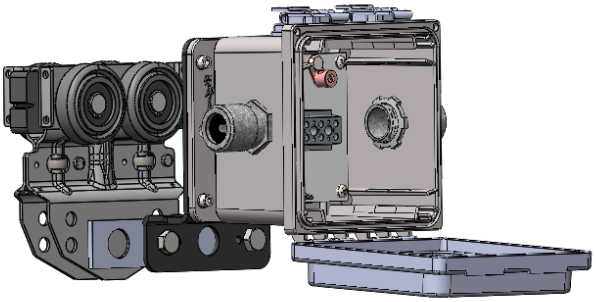
Using the supplied screws (M6x16, Part Number 9091249), and spring washers (M6, Part Number 9012709) attach the junction box to the universal mounting bracket as shown in the figure below.



Step 2 Figure Attachment of the junction box to the universal mounting bracket

Step 3: Attach the junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511, Extension Bracket part number 83620), attach the junction box and bracket assembly to the trolley, as shown in the figure below.

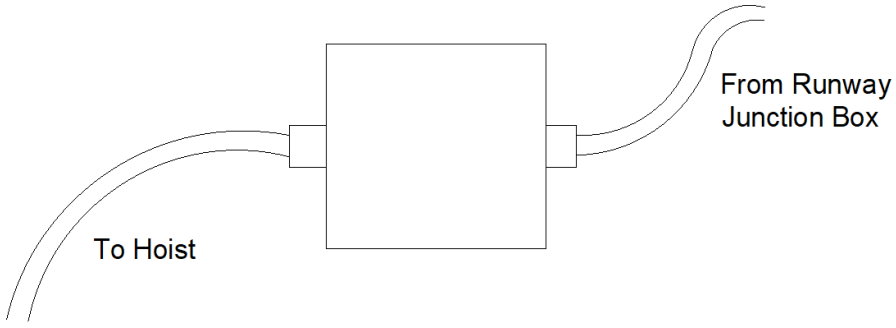


Step 3 Figure Installation of the junction box and bracket assembly onto the end truck trolley

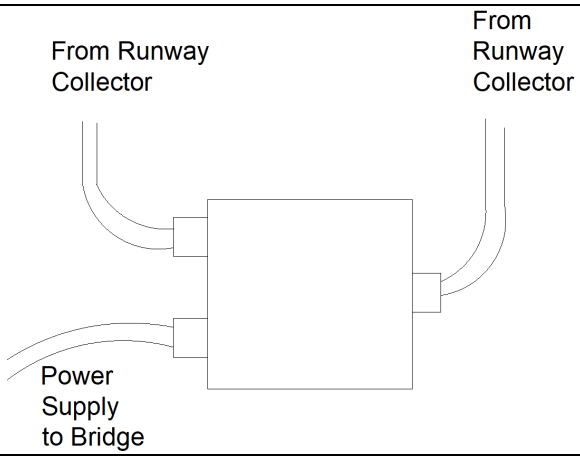
Step 4: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



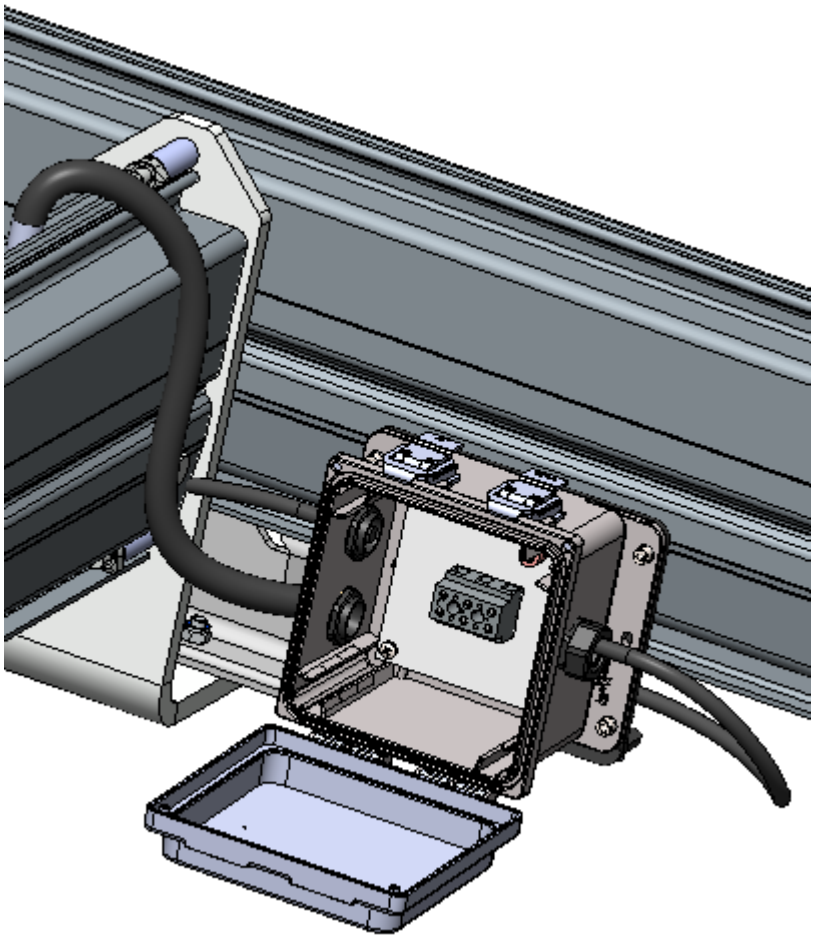
Step 4 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 4 Figure Junction box connection diagrams – ICE dual runway collectors

Step 5: Connect bridge ICE cable into junction box

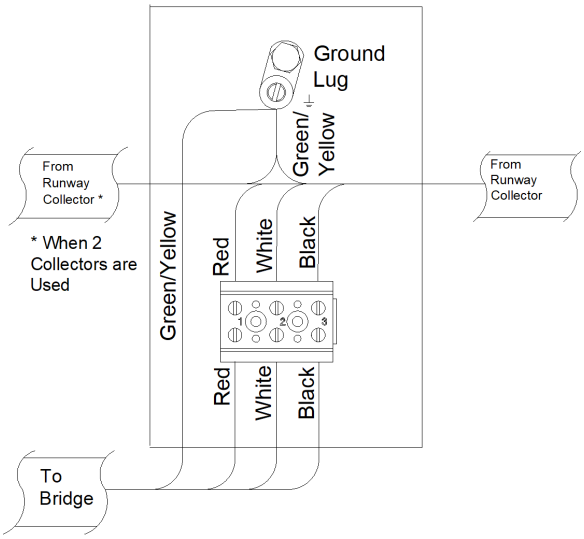
As shown in the image below, feed the already installed ICE power cable from the bridge into the junction box through the cable fitting on the lower left side of the junction box.



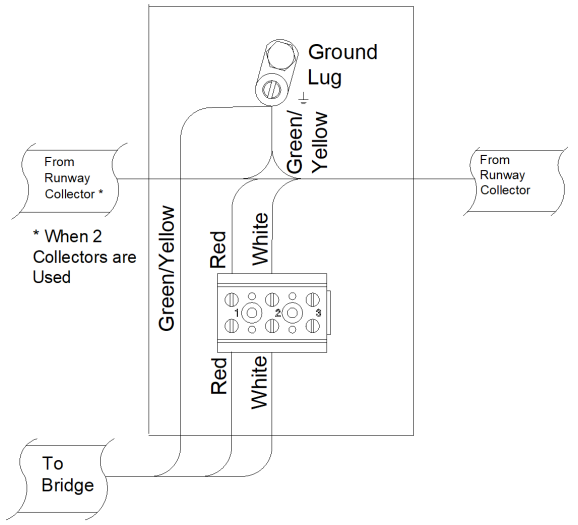
Step 5 Figure Power cable connection between junction box and bridge

Step 6: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the image below.



Step 6 Figure Wiring diagram for 3-phase power



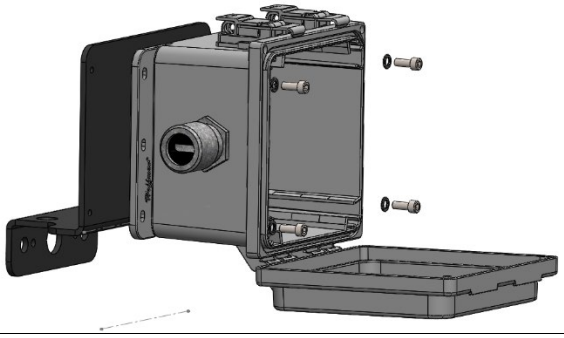
Step 6 Figure Wiring diagram for single-phase power

Low Headroom
Steel Double Girder Bridge with Flat Cable

NOTICE Before proceeding, verify that the flat cable and flat cable trolleys are installed on the bridge. The following steps for electrification installation cannot be completed unless the flat cable is installed.

Step 1: Attaching junction box to universal mounting bracket

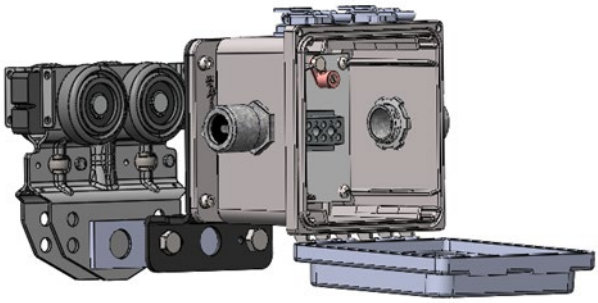
Using the supplied hardware (M6x16, Part Number 9091249), and spring washers (M6, Part Number 9012709), fix the junction box to the universal mounting bracket as shown in the figure below.



Step 1 Figure Attachment of the junction box to the universal mounting bracket

Step 2: Attaching junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511, Extension Bracket part number 83620), attach the junction box and bracket assembly to the trolley, as shown in the figure below.

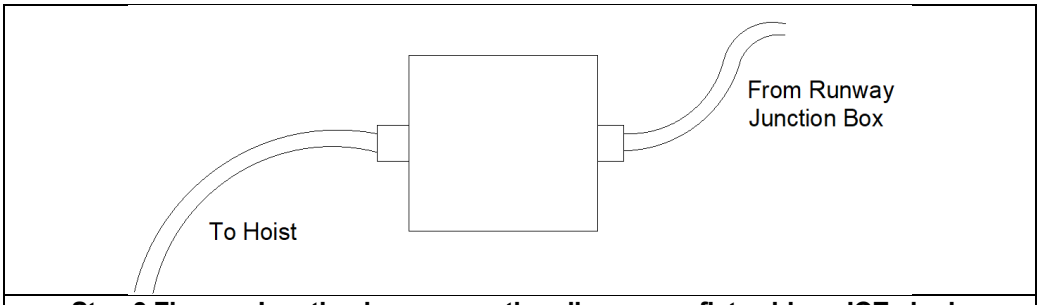


Step 2 Figure Installation of the junction box and bracket assembly onto the end truck trolley

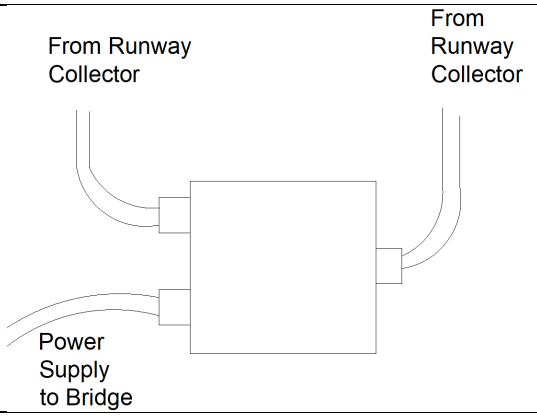
Step 3: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



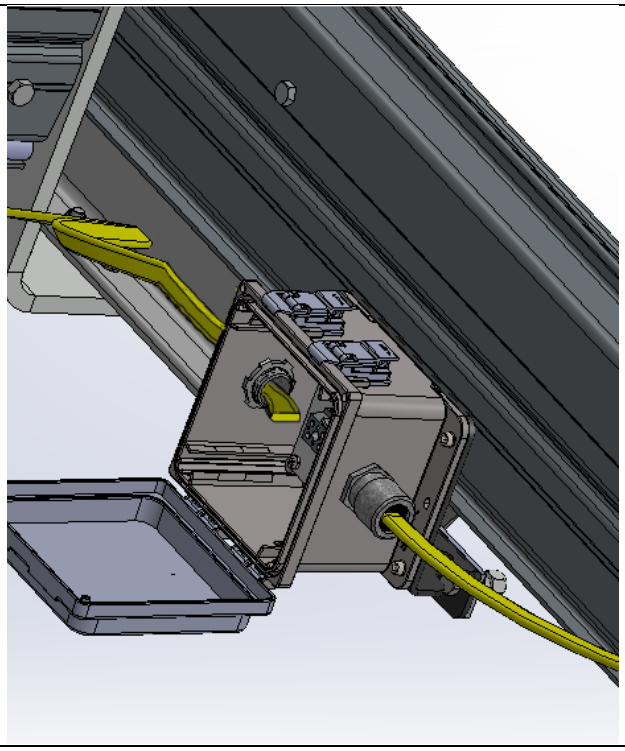
Step 3 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 3 Figure Junction box connection diagrams – ICE dual runway collectors

Step 4: Connect bridge flat cable into junction box

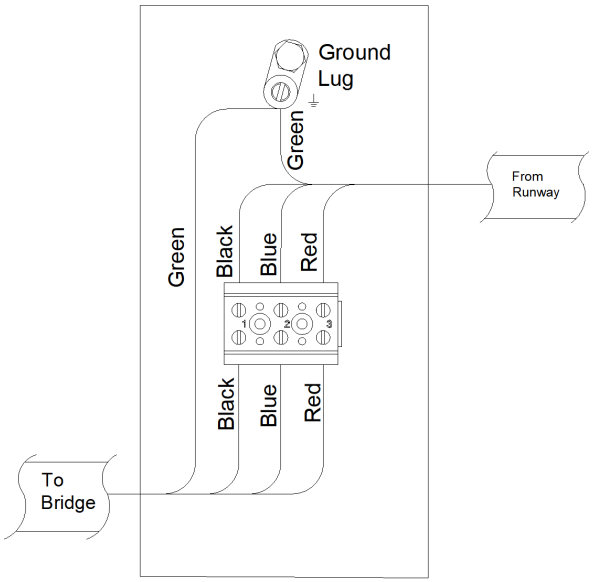
As shown in the figure below, feed the flat cable from the bridge cable festoon, into the cable fitting on the left side of the junction box.



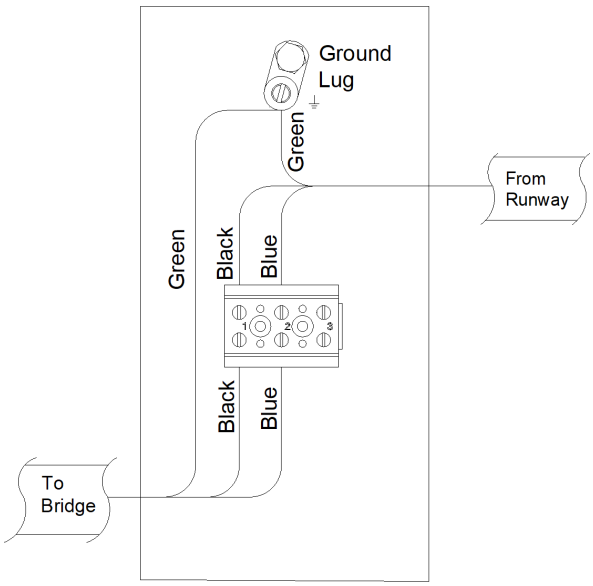
Step 4 Figure Bridge junction box wiring

Step 5: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the figures below.



Step 5 Figure Junction box wiring configurations for 3-phase power



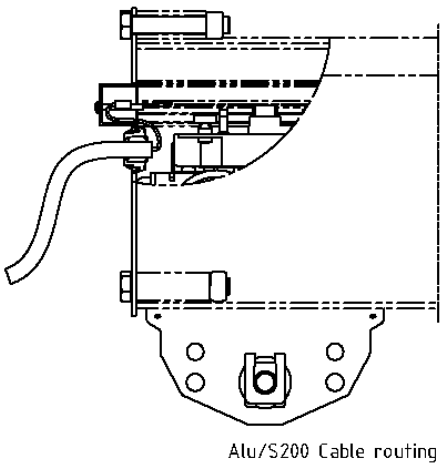
Step 5 Figure Junction box wiring configurations for single-phase power

Low Headroom
Aluminum Double Girder Bridge with Internal Conductor Electrification

Step 1: Attach the power cable to the bridge internal conductor bar

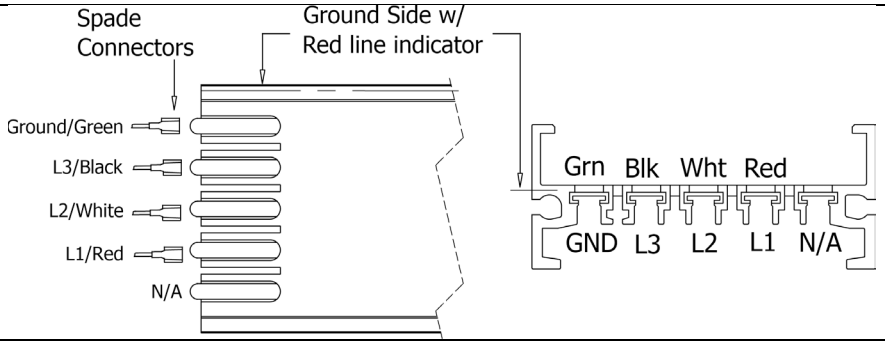
Before proceeding with bridge installation, install the bridge power cable to the bridge internal conductor bar as shown in the figure below.

NOTICE When internal conductor electrification is used on the bridge(s), the power cable that connects the bridge junction box to the internal conductor bar on the bridge **MUST** be installed on the bridge prior to lifting the bridge into position and connecting it to the runway.

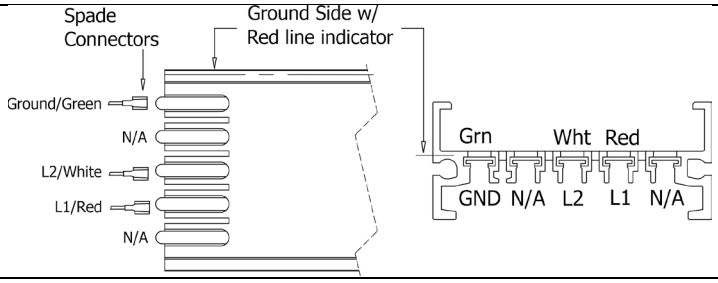


Step 1 Figure Attachment of the bridge power cable to the internal conductor bar

⚠ CAUTION For systems equipped with internal conductor electrification, the ground side of the track is indicated with a sticker label reading “GROUND SIDE” at the end of the track piece.



Wiring connections for 3-phase power

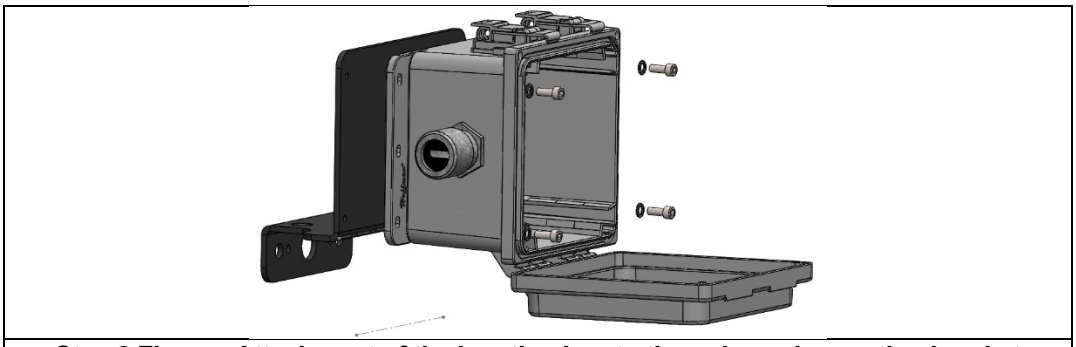


Wiring connections for single-phase power

Step 1 Figure Individual conductor attachments for bridge internal conductor bar

Step 2: Attach the junction box to the universal mounting bracket

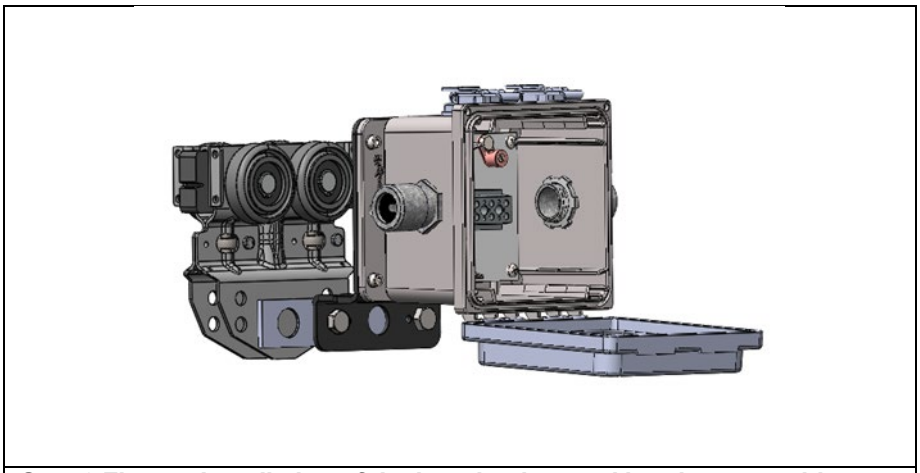
Using the supplied screws (M6x16, Part Number 9091249), and spring washers (M6, Part Number 9012709) attach the junction box to the universal mounting bracket as shown in the figure below.



Step 2 Figure Attachment of the junction box to the universal mounting bracket

Step 3: Attach the junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511, Extension Bracket part number 83620), attach the junction box and bracket assembly to the trolley, as shown in the figure below.

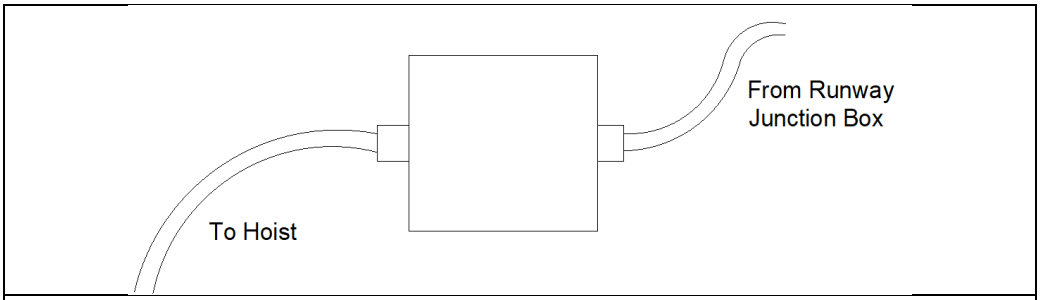


Step 3 Figure Installation of the junction box and bracket assembly onto the end truck trolley

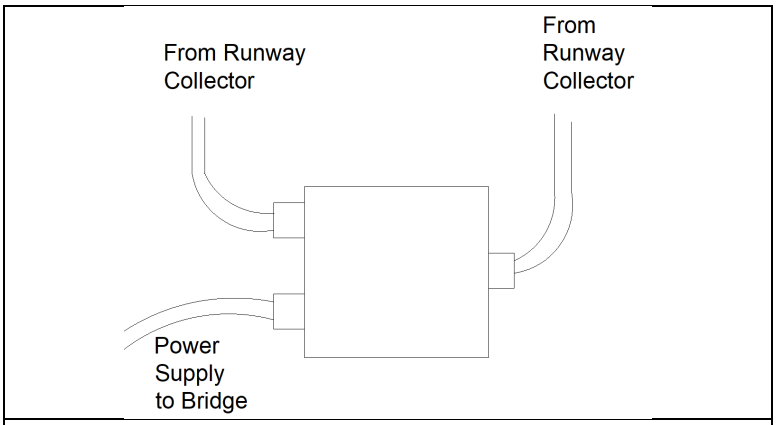
Step 4: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



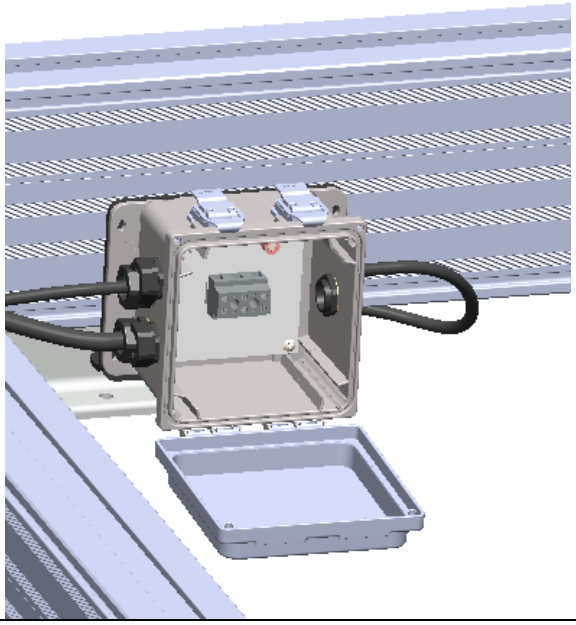
Step 4 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 4 Figure Junction box connection diagrams – ICE dual runway collectors

Step 5: Connect bridge ICE cable into junction box

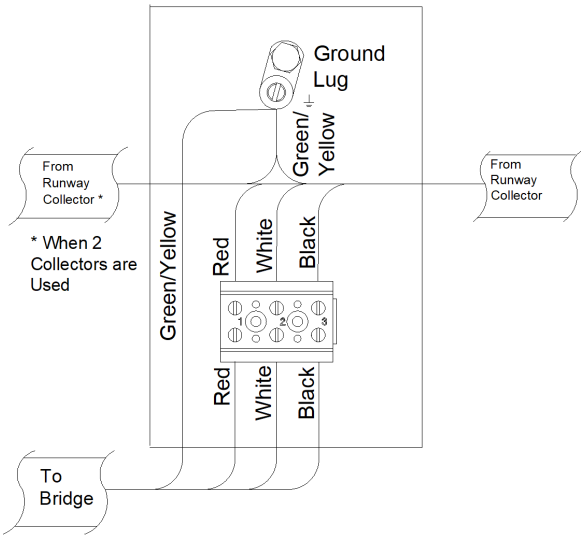
As shown in the image below, feed the already installed ICE power cable from the bridge into the junction box through the cable fitting on the lower left side of the junction box.



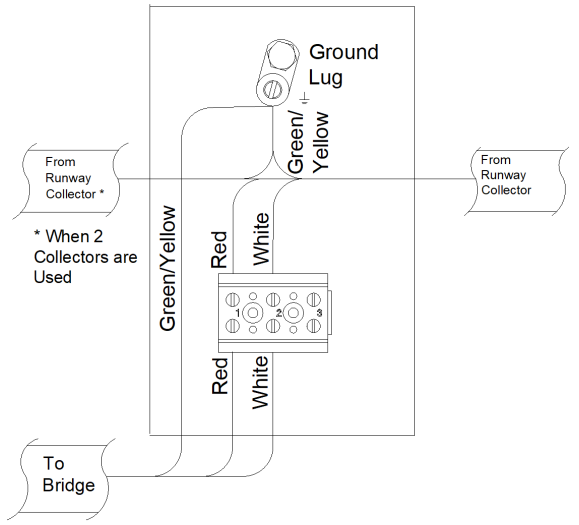
Step 5 Figure Power cable connection between junction box and bridge

Step 6: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the image below.



Step 6 Figure Wiring diagram for 3-phase power



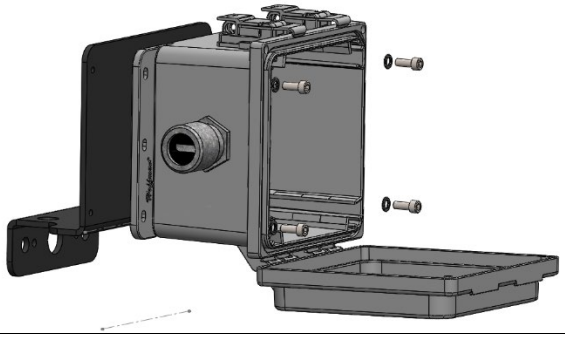
Step 6 Figure Wiring diagram for single-phase power

Low Headroom
Aluminum Double Girder Bridge with Flat Cable

NOTICE Before proceeding, verify that the flat cable and flat cable trolleys are installed on the bridge. The following steps for electrification installation cannot be completed unless the flat cable is installed.

Step 1: Attaching junction box to universal mounting bracket

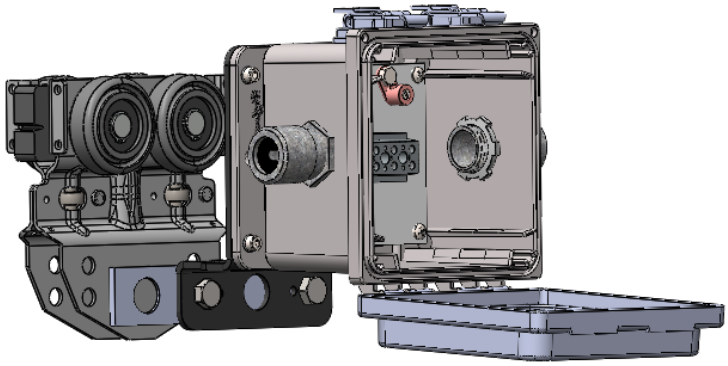
Using the supplied hardware (M6x16, Part Number 9091249),and spring washers (M6, Part Number 9012709), fix the junction box to the universal mounting bracket as shown in the figure below.



Step 1 Figure Attachment of the junction box to the universal mounting bracket

Step 2: Attaching junction box and bracket assembly to the end truck trolley

Using the hardware provided (M12x1.75x25 part number 9093370, M12 nylon insert lock nut, part number 9098511, Extension Bracket part number 83620), attach the junction box and bracket assembly to the trolley, as shown in the figure below.

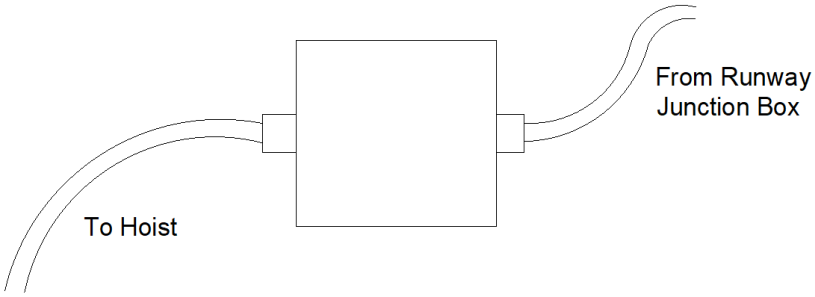


Step 2 Figure Installation of the junction box and bracket assembly onto the end truck trolley

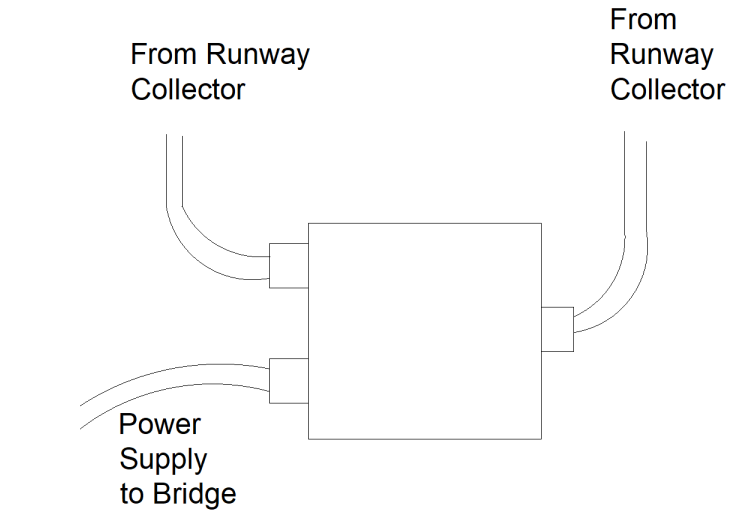
Step 3: Connect the runway collector cable or flat cable into the junction box

Fit the current collector cable (for ICE runway) or flat cable into the bridge junction box as shown in the figures below, using the cable fitting on the right side of the junction box.

NOTICE For cranes equipped with ICE on the runway, and when a hoist equipped with VFD control is configured, two collectors are used on the runway. Both collector cables must be installed into the bridge junction box.



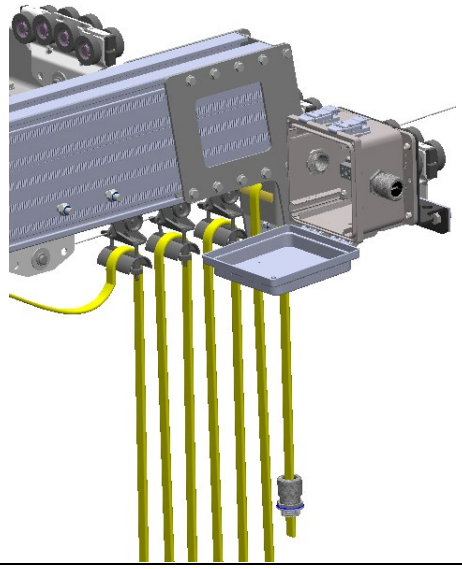
Step 3 Figure Junction box connection diagrams – flat cable or ICE single collector runway



Step 3 Figure Junction box connection diagrams – ICE dual runway collectors

Step 4: Connect bridge flat cable into junction box

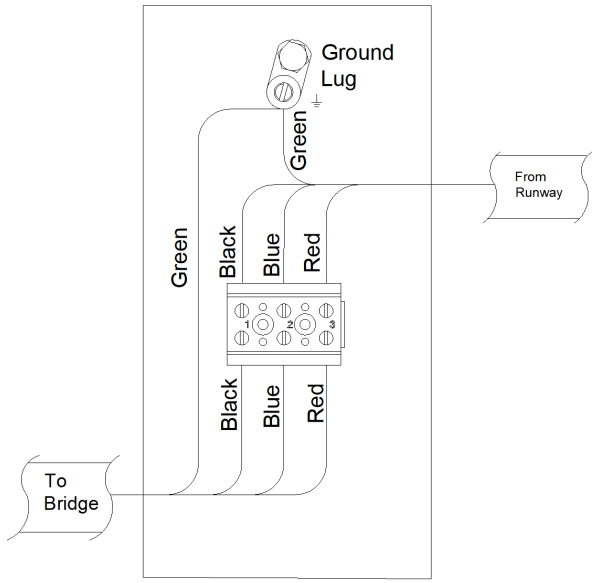
As shown in the figure below, feed the flat cable from the bridge cable festoon, into the cable fitting on the left side of the junction box.



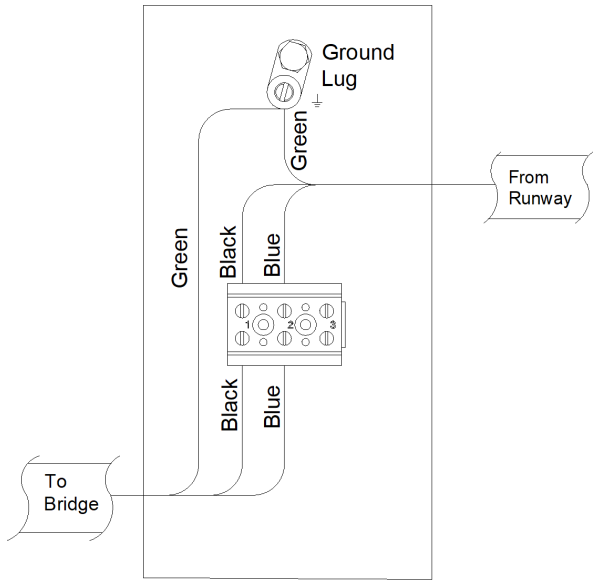
Step 4 Figure Bridge junction box wiring

Step 5: Make wiring terminations inside bridge junction box

After the power cables from the runway and to the bridge have been fitted into the junction box, install the individual conductors of each cable to the terminal strip in the junction box according to the figures below.



Step 5 Figure Junction box wiring configurations for 3-phase power



Step 5 Figure Junction box wiring configurations for single-phase power

3.5.6 Power Supply Connection to Hoist

For power supply connection to the hoist, refer to the included hoist owner's manual which can also be found at harringtonhoists.com for a digital copy.

Hoist with Internal Conductor Connection

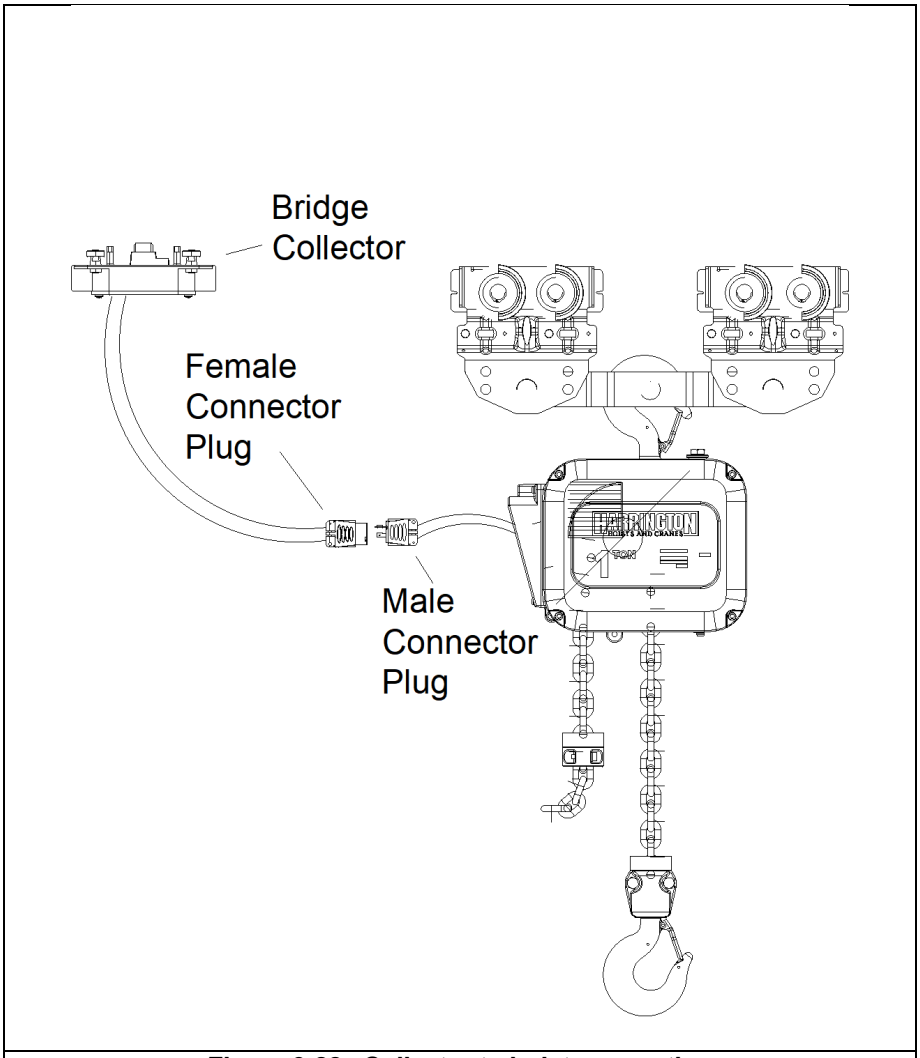


Figure 3-88 Collector to hoist connection

As shown in **Figure 3-87**, the hoist and collector will be connected using a twist-lock plug/socket. When configured with the crane system, the male plug is preinstalled on the hoist. The installer is responsible for connecting the female socket to the collector cable. Refer to **Figure 3-89** for three phase power wiring terminations in the female socket. Refer to **Figure 3-90** for single phase power wiring terminations in the female socket.

Refer to the wire preparation diagram on the Hubbell Twist-Lock packaging. There should be approximately 1 ½" (38mm) of wire stripped from the collector cable. The wires from the collector cable are stripped 11/16" (18mm) from the ends. The stripped ends are then placed into the corresponding terminals and tightened in place.

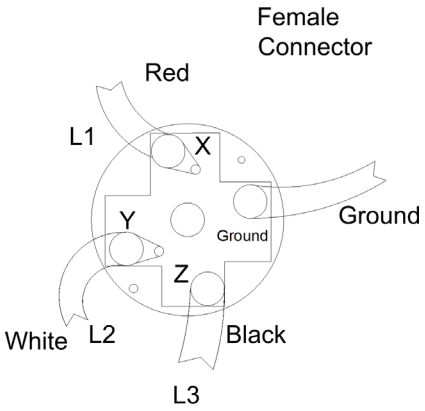


Figure 3-89 3 phase female twist-lock connector for ICE

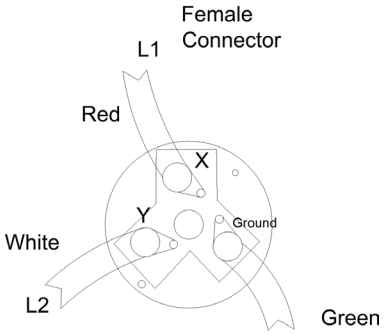
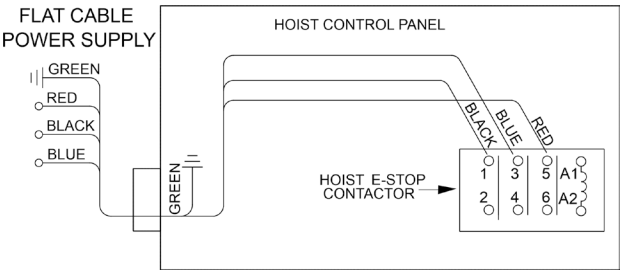


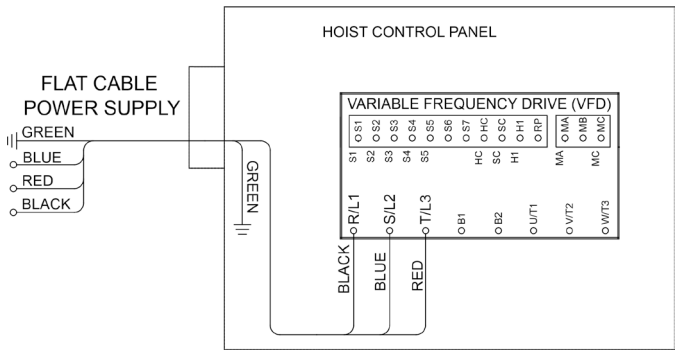
Figure 3-90 Single phase female twist-lock connector for ICE

Hoist with Flat Cable Connection

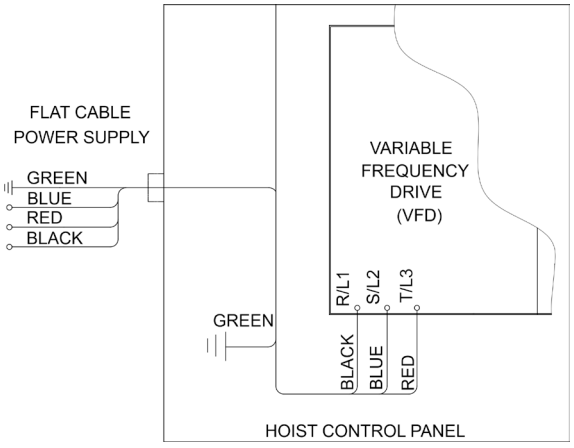
When flat cable is used for hoist electrification, the flat cable must be connected in the hoist. Use the flat cable with preinstalled ring terminals. Connect the conductors according to **Figures 3-91** and **3-92**, for the applicable hoist.



ER2 Single Speed Hoist with Flat Cable

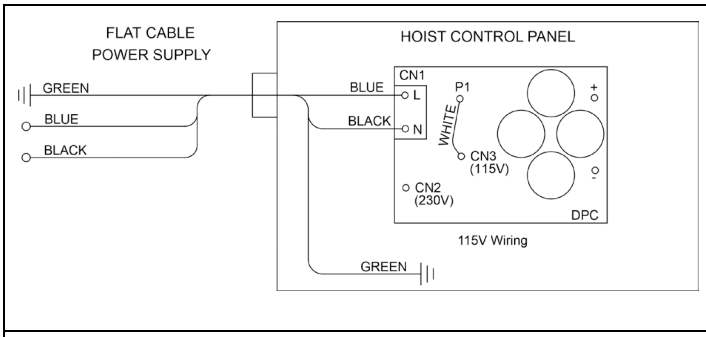


ER2 Dual Speed Hoist with Flat Cable

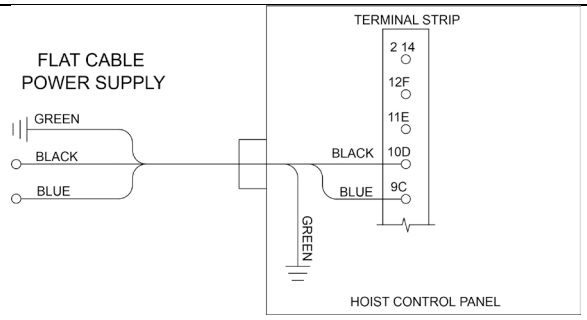


EQ Hoist with Flat Cable

Figure 3-91 Three Phase Hoist Power Connection for Flat Cable



SEQ Hoist with Flat Cable



SNER Hoist with Flat Cable

Figure 3-92 Single Phase Hoist Power Connection for Flat Cable

3.6 Installation Tolerances and Torque Table

The span must be constant throughout the distance of the runway tracks. The tolerance for the span is plus/minus 1/8 inch (3mm).

The height difference of the track profiles shall be constant throughout the track. Tolerance to span for the height difference is 0.002 x S.

Only original Harrington parts may be used for the assembly of the workstation crane system. The normally intended locking elements may not be replaced by other types of elements. All fittings with threaded bolts must be secured, depending on respective specifications. Mandatory tightening torques must be followed. Unless a product specific tightening torque is provided, use the tightening torques shown below. Screw threads may not be lubricated – the given values will then be too high. Always tighten nuts and bolts to the correct torque.

Table 3-21

Grade 8.8 Hardware	Tightening Torque lbf-ft (Nm)
M6	7.4 (10)
M8	18.4 (25)
M10	33.2 (45)
M12	59 (80)
M16	143.8 (195)

Table 3-22

Part Number	Description	Torque, lbf-ft (N-m)
TTE430101	Track Clamp 200/260	18.4 (25)
TTEEAN17001	Track Clamp ALU	7.4 (10)
TTE430037	Clamping claws	111 (150)
TTE430125	Ceiling plate adjustable 200/260	70 (95)
TTE430190	Suspension to inclined I-beam, =<25°, 100 - 300 mm	111 (150)
TTE400411	Joint for S-Profile	59 (80)
TTEEAN13001	Joint set ALU, =<500kg	18.4 (25)
TTEEAN13011	Joint set ALU, =<1000kg	18.4 (25)
TTE420112	End plate S200	59 (80)
TTE420212	End plate S260	59 (80)
TTE430451 + TTE400439	End plate for 2-girder bridge 200 without bolts + bolt kit	59 (80)
TTE430452 + TTE400439	End plate for 2-girder bridge 260 without bolts + bolt kit	59 (80)
TTEEAN11002	End plate ALU2/105	18.4 (25)
TTEEAN11003	End plate ALU3/140	18.4 (25)
TTEEAN11004	End plate ALU4/180	18.4 (25)
TTEEAN11005	End plate ALU5/220	18.4 (25)
TTE430119	Link suspension 200/260, trolley	18.4 (25)
TTEEAN07001	Link suspension for trolley, ALU	7.4 (10)
TTE430315	Bolt kit for triangle support	111 (150)

Table 3-22		
TTE446111	Raising part 200	M12= 59 (80); M10= 33.2 (45)
TTE446211	Raising part 260	M12= 59 (80); M10= 33.2 (45)
TTEEAN03002	Raising part ALU 2	M8= 18.4 (25); M10= 33.2 (45)
TTEEAN03003	Raising part ALU 3	M8= 18.4 (25); M10= 33.2 (45)
TTEEAN03004	Raising part ALU 4	M8= 18.4 (25); M10= 33.2 (45)
TTEEAN03005	Raising part ALU 5	M8= 18.4 (25); M10= 33.2 (45)

4.0 Operation

4.1 Operational Environment

⚠ WARNING Workstation cranes and monorails shall only be used in environments as intended by its design. Using the system in an operating environment not within it's intended design can result in material damages and serious or fatal injury.

Workstation cranes and monorails shall not be deployed for operation in the following environments

- High risks applications such as transporting molten metal or nuclear safety
- Explosive gases or vapors
- Solvents or volatile powder
- Excessive acids or salts
- High heat applications or near equipment of high heat generation
- Excessive accumulation of conductive dust and deposits such as galvanizing, grinding, polishing and pickling facilities.

NOTICE Ambient operation temperatures of a crane system will vary as a result of the respective hoist connected to the system. For example, an electric hoist will reduce the maximum ambient temperature capability of the entire crane system. Refer to hoist owner's manual for operating conditions of the specific hoist used on your crane system.

⚠ DANGER

DO NOT WALK UNDER A SUSPENDED LOAD

⚠ WARNING

CRANE OPERATORS SHALL BE REQUIRED TO READ THE OPERATION SECTION OF THIS MANUAL, THE WARNINGS CONTAINED IN THIS MANUAL, INSTRUCTION AND WARNING LABELS ON THE CRANE OR LIFTING SYSTEM, APPLICABLE ANSI AND OSHA SAFETY STANDARDS, AND THE CRANE OPERATOR'S MANUAL PUBLISHED BY THE CRANE MANUFACTURER'S ASSOCIATION OF AMERICA (CMAA). THE OPERATOR SHALL ALSO BE REQUIRED TO BE FAMILIAR WITH THE CRANE AND CRANE CONTROLS BEFORE BEING AUTHORIZED TO OPERATE THE CRANE OR LIFTING SYSTEM.

CRANE OPERATORS SHOULD BE TRAINED IN PROPER RIGGING PROCEDURES FOR THE ATTACHMENT OF LOADS TO THE HOIST HOOK.

CRANE OPERATORS SHOULD BE TRAINED TO BE AWARE OF POTENTIAL MALFUNCTIONS OF THE EQUIPMENT THAT REQUIRE ADJUSTMENT OR REPAIR, AND TO BE INSTRUCTED TO STOP OPERATION IF SUCH MALFUNCTIONS OCCUR, AND TO IMMEDIATELY ADVISE THEIR SUPERVISOR SO CORRECTIVE ACTION CAN BE TAKEN.

CRANE OPERATORS SHOULD HAVE NORMAL DEPTH PERCEPTION, FIELD OF VISION, REACTION TIME, MANUAL DEXTERITY, HEARING, AND COORDINATION.

CRANE OPERATORS SHOULD **NOT** HAVE A HISTORY OF OR BE PRONE TO SEIZURES, LOSS OF PHYSICAL CONTROL, PHYSICAL DEFECTS, OR EMOTIONAL INSTABILITY THAT COULD RESULT IN ACTIONS OF THE OPERATOR BEING A HAZARD TO THE OPERATOR OR TO OTHERS.

CRANE OPERATORS SHOULD **NOT** OPERATE A CRANE OR LIFTING SYSTEM WHEN UNDER THE INFLUENCE OF ALCOHOL, DRUGS, OR MEDICATION.

NOTICE

- Read OSHA Specification 1910.179 “Overhead and Gantry Cranes,” ANSI B30.11, “Monorails and Underhung Cranes,” and any other applicable standards.
- Read the hoist manufacturer’s Operating and Maintenance Instructions.
- Read all labels attached to equipment.

4.2 Shall's and Shall Not's for Operation

⚠ WARNING

Improper operation of a crane can create a potentially hazardous situation which, if not avoided, could result in death or serious injury, and substantial property damage. To avoid such a potentially hazardous situation **THE OPERATOR SHALL:**

- **NOT** operate a damaged, malfunctioning or unusually performing crane.
- **NOT** operate a crane until you have thoroughly read and understood Manufacturer's Operating and Maintenance Instructions or Manuals.
- Be familiar with operating controls, procedures, and warnings.
- **NOT** operate a crane that has been modified without the manufacturer's approval.
- **NOT** lift more than rated load for the crane/hoist/trolley.
- **NOT** use the crane to lift, support, or transport people.
- **NOT** lift loads over people.
- **NOT** operate a crane unless all persons are and remain clear of the supported load.
- **NOT** operate unless load is centered under hoist.
- **NOT** leave load supported by the crane/hoist unattended unless specific precautions have been taken.
- **NOT** allow the crane to be used as an electrical or welding ground.
- **NOT** remove or obscure the warnings on the crane.
- **NOT** operate a crane on which the safety placards or decals are missing or illegible.
- **NOT** operate a crane that has any changes in rolling effort or unusual noises.
- Warn personnel before lifting or moving a load.
- Warn personnel of an approaching load.
- Ensure that endstops are in place.
- Ensure that all bolts are tight and have lockwashers.
- **NOT** put hands near moving parts.
- **NOT** move or operate a crane without pins fully inserted into both crane legs.
- **NOT** move crane with load attached.
- **NOT** adjust crane height with load attached.
- Move crane on a flat, level, smooth surface.

⚠ CAUTION

Improper operation of a crane can create a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, or property damage. To avoid such a potentially hazardous situation **THE OPERATOR SHALL:**

- Maintain a firm footing or be otherwise secured when operating the crane.
- Make sure the load is free to move and will clear all obstructions.
- Avoid swinging the load or hook.
- Inspect the crane regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
- Use the crane manufacturer's recommended parts when repairing the unit.
- Lubricate the roller bearings per crane manufacturer's recommendations.
- **NOT** allow your attention to be diverted from operating the crane.
- **NOT** allow the crane to be subjected to sharp contact with other structures, or objects through misuse.
- **NOT** adjust or repair the crane unless qualified to perform such adjustments or repairs.
- Ensure that festooning cannot be snagged or pin

5.0 Inspection

Tiger Track workstation cranes are categorized as light service crane systems. This service covers cranes which may be used in repair shops, light assembly operations, service buildings, light warehousing, etc., where service requirements are light and the speed is slow. Loads may vary from no load to occasional full rated loads with 2 to 5 lifts per hour, averaging 10 feet (3 meters) per lift.

Inspection of the crane system shall be conducted according to the applicable sections of ASME B30.17 Chapter 17-2.

Hoists installed on Tiger Track workstation crane systems shall be inspected according to the ASME B30.16 standard.

6.0 Commissioning

Installation, inspection, function testing, and load testing must be carried out before commissioning the crane system. Only a qualified and authorized person is allowed to do the commissioning.

⚠ CAUTION Follow national and locally applicable regulations. Be aware of safety precautions.

Commissioning Sequence:

1. Using a calibrated torque wrench, verify that all bolts, suspensions, pins and other fasteners are in place and properly installed.
2. Test all movements of the crane up to the extreme positions without load.
3. Conduct a load test according to ASME B30.17-2.2.
4. Create and file a report of the inspection and testing.

7.0 Maintenance

For maintenance follow the inspection and maintenance schedule shown below.

7.1 General guidelines and safety instructions for maintenance

⚠ CAUTION – Always follow these instructions. If instructions are not followed, it may result in hazards, injury, or material damage.

⚠ CAUTION – All maintenance operations must be complied with by trained personnel.

⚠ CAUTION – Ensure that crane is fully unloaded before starting any maintenance operation.

⚠ CAUTION – Switch off the electric power supply and lock the main switch before starting any maintenance operation.

Document all maintenance operations and store all documents the entire life of the crane.
- Be aware of safety precautions while working.
- Ensure suitable tools.
- Maintenance and repairs may only be carried out when the crane is unloaded.
- Follow nationally and locally applicable regulations and standards.

In principle, at least the following parts are inspected or replaced during the basic renovation according to the specification. The entire crane must be thoroughly inspected and documented.

Parts to Inspect:
• All profiles visually for deformation or wear. Profiles with deformation or wear must be replaced.
• Trolleys. Worn or damaged trolleys must be replaced.
• Ceiling suspensions and track clamps. Replace worn parts.

Replaceable Parts:
• All suspension joints

• Extension bolts
• Trolley axles
• Moving cables
Refer to the hoist manual for procedures for the hoist.

8.0 Warranty

All products sold by Harrington Hoists, Inc. are warranted to be free from defects in material and workmanship from date of shipment by Harrington for the following periods:

1 year – Electric and Air Powered Hoists (excluding (N)ER2 Hoists and EQ/SEQ Hoists), Powered Trolleys, Powered Tiger Track Jibs and Gantries, Crane Components, Below the Hook Devices, Spare / Replacement Parts

2 years – Manual Hoists & Trolleys, Beam Clamps

3 years – (N)ER2 Hoists, EQ/SEQ hoists, (T)EM/(T)SEM Hoists, and RY Hoists

5 years – Manual Tiger Track Jibs and Gantries, Hoist Motor Brakes for TNER, EQ/SEQ, (T)EM/(T)SEM, and RY

10 years – (N)ER2 Brake, Tiger Track Workstation Cranes and Monorails

The product must be used in accordance with manufacturer's recommendations and must not have been subject to abuse, lack of maintenance, misuse, negligence, or unauthorized repairs or alterations.

Should any defect in material or workmanship occur during the above time period in any product, as determined by Harrington Hoist's inspection of the product, Harrington Hoists, Inc. agrees, at its discretion, either to replace (not including installation) or repair the part or product free of charge and deliver said item F.O.B. Harrington Hoists, Inc. place of business to customer.

Customer must obtain a Return Goods Authorization as directed by Harrington or Harrington's published repair center prior to shipping product for warranty evaluation. An explanation of the complaint must accompany the product. Product must be returned freight prepaid. Upon repair, the product will be covered for the remainder of the original warranty period. Replacement parts installed after the original warranty period will only be eligible for replacement (not including installation) for a period of one year from the installation date. If it is determined there is no defect, or that the defect resulted from causes not within the scope of Harrington's warranty, the customer will be responsible for the costs of returning the product.

Harrington Hoists, Inc. disclaims any and all other warranties of any kind expressed or implied as to the product's merchantability or fitness for a particular application. Harrington will not be liable for death, injuries to persons or property or for incidental, contingent, special or consequential damages, loss or expense arising in connection with the use or inability whatever, regardless of whether damage, loss or expense results from any act or failure to act by Harrington, whether negligent or willful, or from any other reason.

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