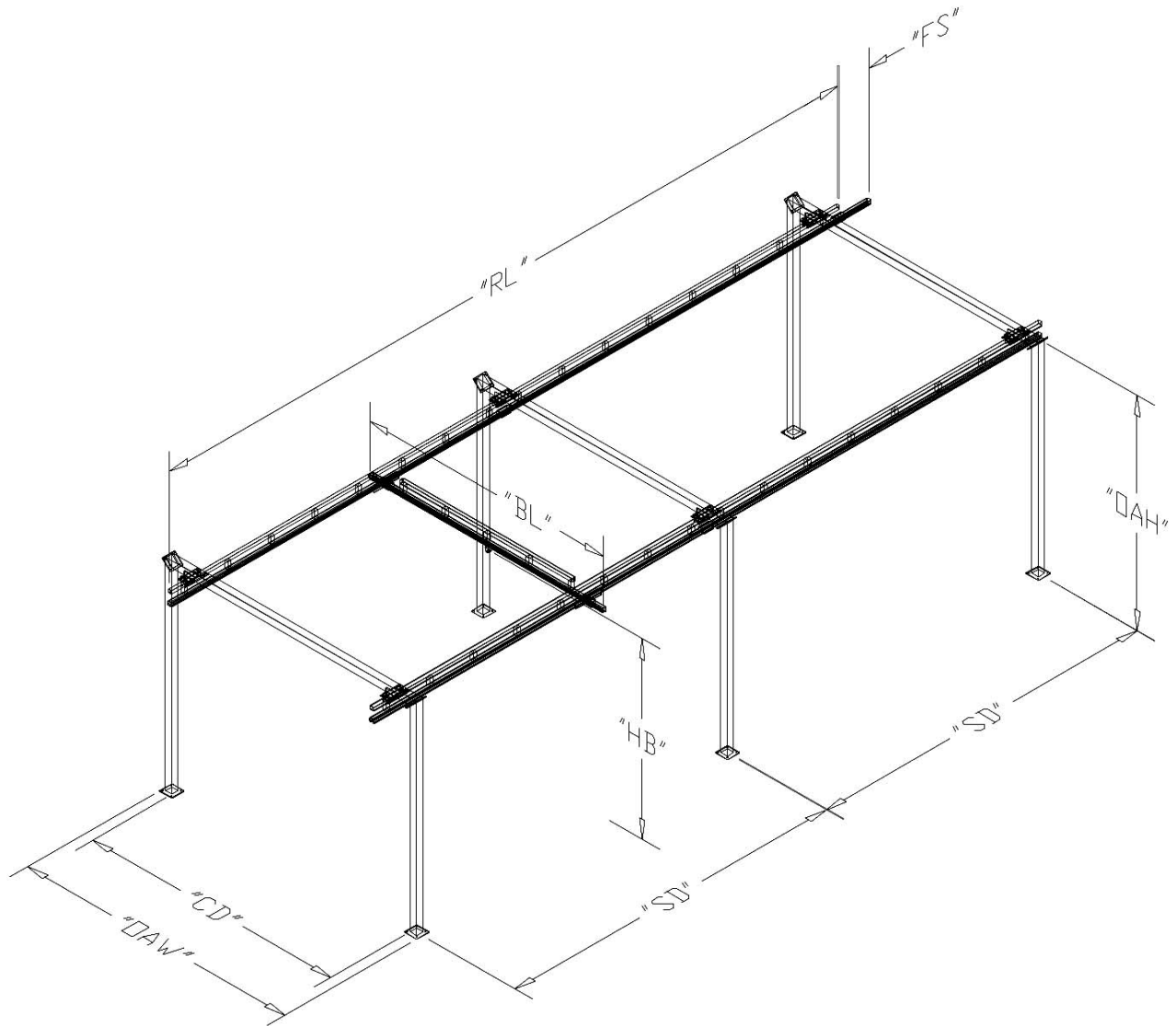


LodeRail™

FREE STANDING CRANE SYSTEM

INSTALLATION PROCEDURE MANUAL



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FREE STANDING CRANE SYSTEM
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You are now the owner of a free standing (self supporting) LodeRail system, one of the finest overhead crane systems available. Thank you for selecting a Columbus McKinnon Corporation product. The LodeRail system incorporates superb engineering design, carefully chosen material and excellent construction to provide you with a product that will deliver years of reliable performance for meeting your material handling needs. All LodeRail systems are pre-engineered to meet all applicable codes, including seismic zone 4 conditions. This manual will guide you through the steps for installing your LodeRail system. It is recommended that the end user consult a qualified architect or engineer to prepare a design or layout drawing for the application.

WARNING

IMPROPER INSTALLATION AND USE CAN RESULT IN PERSONAL INJURY.

TO AVOID INJURY:

- Carefully read and observe installation procedure.
- Refer to and comply with any applicable local, state, and federal codes and regulations.
- Do not use this system for support or transport of people.
- Do not alter or modify system – use only hardware and components provided.
- Do not exceed capacity of system or hoisting unit(s).
- Do stay clear of load(s) during operation.

STEP 1 – GENERAL INFORMATION AND CHECK LIST

Hoist weight is not to exceed 15 percent of rated capacity of crane.

Thoroughly read this installation procedure before beginning to install the system. The check list below is not intended to be complete. Use common sense and good judgement. Also check local, state and federal regulations for any additional requirement. This system is not to be used for supporting or transporting people; use of this equipment for such application is a code violation and can result in serious bodily injury and/or property damage.

Modifications and Additions:

The system is supplied with a complete set of installation hardware (bolts, hex nuts, lock washers, flat washers). Do not replace factory furnished hardware with other material. **Do not make modifications or additions to any component of the system without the prior approval of a qualified engineer. Any warranty work performed on the LodeRail System must be pre-approved by LodeRail.**

Concrete Floor:

Before installing the free standing LodeRail system, the condition of the supporting concrete floor must be examined and the adequacy verified by a qualified engineer and may be subject to the requirements of local codes and ordinances. As a general rule, a 4-inch nominal slab may be adequate for a 1,000-pound capacity system, a 5-inch slab for a 2,000-pound system, and an 8-inch slab for a 4,000-pound system.

This system is designed to be self-supporting. Bracing and ties to the building are not necessary on standard configured systems. Dynamic forces due to the movement of the trolley and end trucks are incorporated in the design of the system. Lateral deflection from these forces cannot be eliminated. However, the deflection is designed to stay within acceptable limits.

Check List for Crane Operation:

- (1) Check for any obstructions to crane and trolley travel,
- (2) For systems with festooning, check to make sure the festooning (flat electrical cable) cannot be pinched or snagged,
- (3) Check that there is a minimum clearance (from any structure) of 2 inches at end of bridge girder (or hoist body) and 3 inches above any point on the crane along the entire travel of the crane, and
- (4) Check that there is a minimum of 2 inches of space from the ends of the runway and the corners of the support frame to any structure.

Check List Prior to Installation:

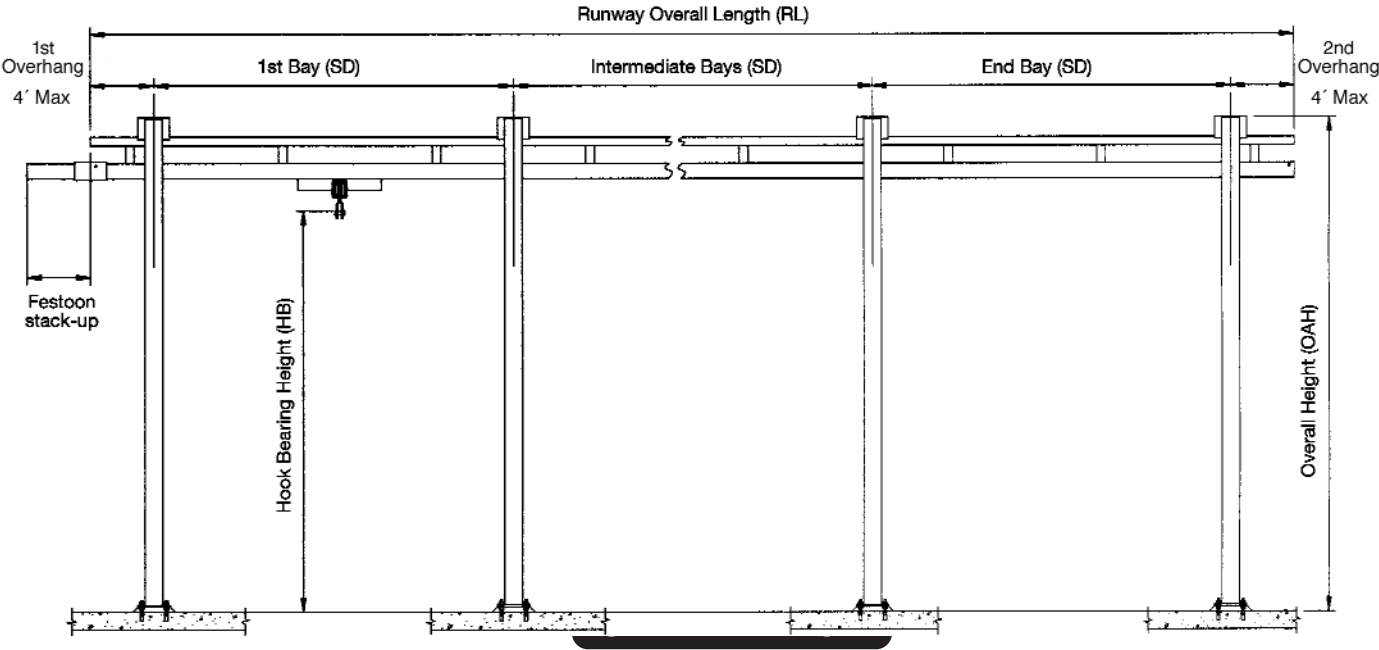
- (1) Qualified installers,
- (2) Qualified equipment operators,
- (3) Proper equipment and tools,
- (4) Safe working area
- (5) Standard safety attire, e.g., hard hat, back brace, safety shoes, safety glasses, fall arrest equipment, work gloves, etc.
- (6) Other safety precautions for your particular conditions.

STEP 2 – PLANNING AND STAGING

1. It is advisable to plan the installation of the crane. Check for accessibility and job site obstructions. Also, keep in mind that the final phase of the installation will be installing the bridge crane on to the runway. The simplest method is to roll the bridge crane on to the end of the runway. If the ends of the runway are going to be against obstructions, install the bridge crane before the last section of the runway track is erected. If this is not possible, see step 2-2 below.
2. See *Figure 2* for minimum access clearance required for crane installation and/or removal. Applications with very limited space will need to utilize a long wheel base end truck (20 ETLs, 10 ETLs, 05 ETLs OR 02 ETLs). These end trucks can be assembled with the runway track in place.
3. If your system is powered (electric or air), determine which runway track will carry the power supply. Runways using festooning (for electric or air power) are usually furnished with a stack-up section that mounts on one end of one runway. Determine placement of the stack-up section and allow space to accommodate this. See *Figure 2* for minimum space required. The stack-up section can be installed after the crane. Either the stack-up section or the crane installation will determine the minimum clearance required at one end of the runway.
4. Before proceeding with the layout, check the parts and quantities against the packing list, especially the bolts and anchors. Go over the packing list and identify all items. *Clean the inside of the tracks and remove any dirt and debris.*
5. Plan to stage the material when unloading so that it will allow a good material flow. The columns go first, headers second, runway tracks third and the crane last.

STEP 3 – START OF LAYOUT

1. Runway alignment is the most important requirement for good crane operation. The runway alignment will directly depend on the alignment and the installation of the frame columns. The support brackets and the connecting clamp angles securing the runway to the header are provided with slotted holes. This will accommodate $\frac{1}{4}$ inch deviation from reference centerlines and still allow theoretical perfect alignment to be maintained. For runway alignment deviation tolerance, see step 6 on page 6 of this manual.
2. *Figure 1* shows the basic layout of the system. Select one of the corner columns shown on the diagram as a starting point for the layout. Locate the opposite column of the same support frame at a distance "FC". This will be the center-to-center width of the frame. Mark two parallel lines "FC" apart on the floor (using a chalk line, a string or a laser instrument) approximately the length of the runway. Check to make sure that the columns are directly opposite each other (frames must be perpendicular to the lines within $\frac{1}{4}$ " in 20'-0"). One method that can be used to check this, if the floor is clear of obstructions, is to form a 3-4-5 triangle (see *Figure 1*). Locate the other columns using the "SD" dimension. Recheck your final layout. Accuracy of the layout will facilitate installation and result in a smoother operating system.
3. Using a transit or a sight level, determine the highest point on the floor where a column will rest. Plan to level all the other columns to this high point. Allow 1 inch of grout under the column base at the high point. The hardware provided with a standard system will be able to accommodate grout settings from $\frac{3}{4}$ inch to 2 $\frac{1}{4}$ inches (see *Figure 3*). If the column location is flat and the difference between the high and low points do not exceed $\frac{1}{8}$ inch in 20 feet, columns may be set directly on the floor but be advised that the use of grout offers advantages. Be aware that excessive slope of the bridge girder or of the runway track could cause a hoist-trolley or a bridge to coast to the low side.



"SD" = Support Distance
 "TW" = Tube Width
 "CD" = Clear Distance
 "FC" = Frame Centers

"FS"
 Festoon
 stack-up

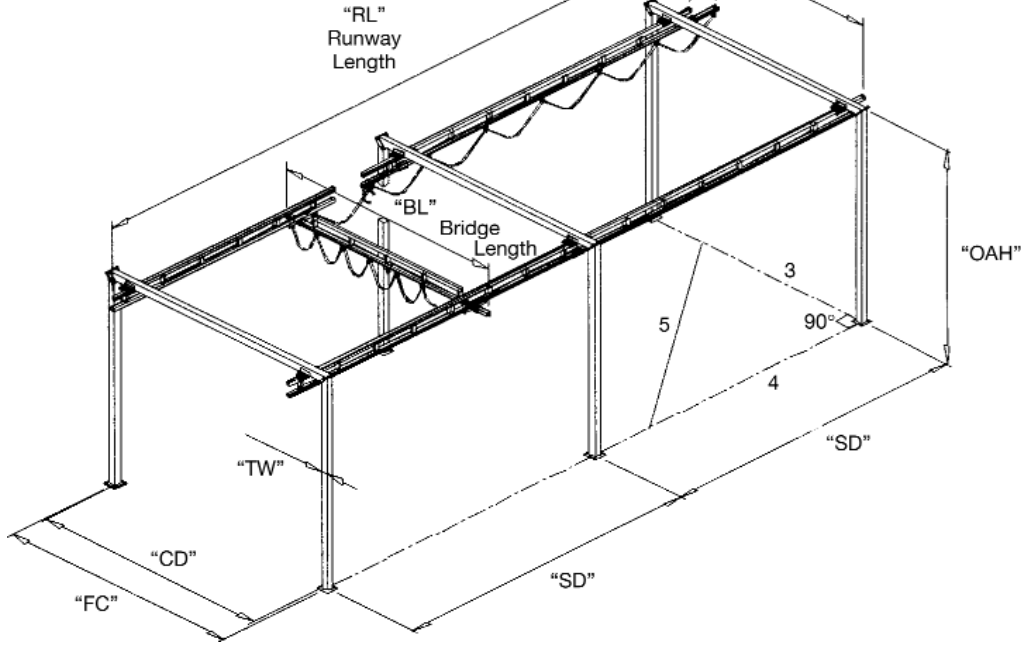


FIGURE 1

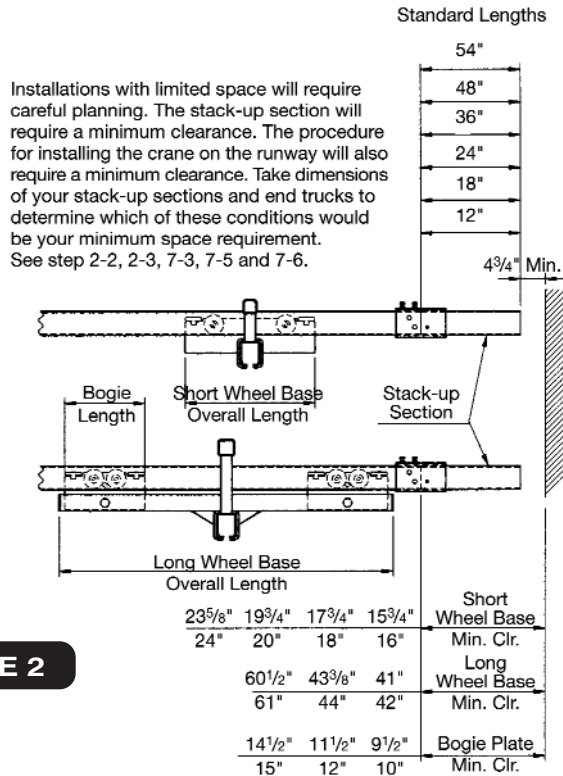


FIGURE 2

STEP 4 – SETTING ANCHORS

1. Doing one side at a time, layout and mark 4 center points on the slab for the anchors for each column using a pattern of 7¹/₂" x 7¹/₂" (3³/₄" from the column center point on each side in both axial direction). See *Figure 3*. One additional step the installer can take is to fabricate a template out of wood and use this for laying out the bolt pattern and for drilling the holes for all anchors. This will facilitate the layout and help maintain consistency.
2. Other manufacturers do not supply anchors. For your added convenience we provide four shell type anchors per column with hardware.
3. Drill a 5/8" diameter hole (2" deep) into the concrete for each anchor. Blow out all cuttings and debris out of the hole. Insert the anchor shell, with the threaded end up, into the drilled hole. The shell anchor has an insert inside. With the use of a drift punch or a setting tool, expand the shell anchor by driving the insert downward with a hammer until it feels secure (see *Figure 3*). Be careful not to damage the thread of the shell anchor.
4. Insert a 1/2-inch diameter threaded rod in each anchor to full engagement of the threads (a minimum of 1/2-inch). Install one hex nut and one flat washer onto each threaded rod. These will be used as leveling nuts.
5. Leveling nuts must be used for all locations unless the column will rest directly on the floor. If you have a transit, a sight level or a laser, you may be able to set the leveling nuts (which would be the bottom of the base plates) to their finish elevation. Otherwise, use a builder's level or string level to approximately set the elevation of the leveling nuts.
6. Select one leveling nut (preferably one towards the inside of the system) in each group as a reference. Mark the threaded rod and the nut (with a felt pen for example) so it can always be reset to original setting in case it is moved.
7. Do not be too concerned about the exact elevation of the leveling nuts at this time. The above procedure leads to a good starting point. The elevation of the entire system can be leveled by final adjustments to the hex nuts.

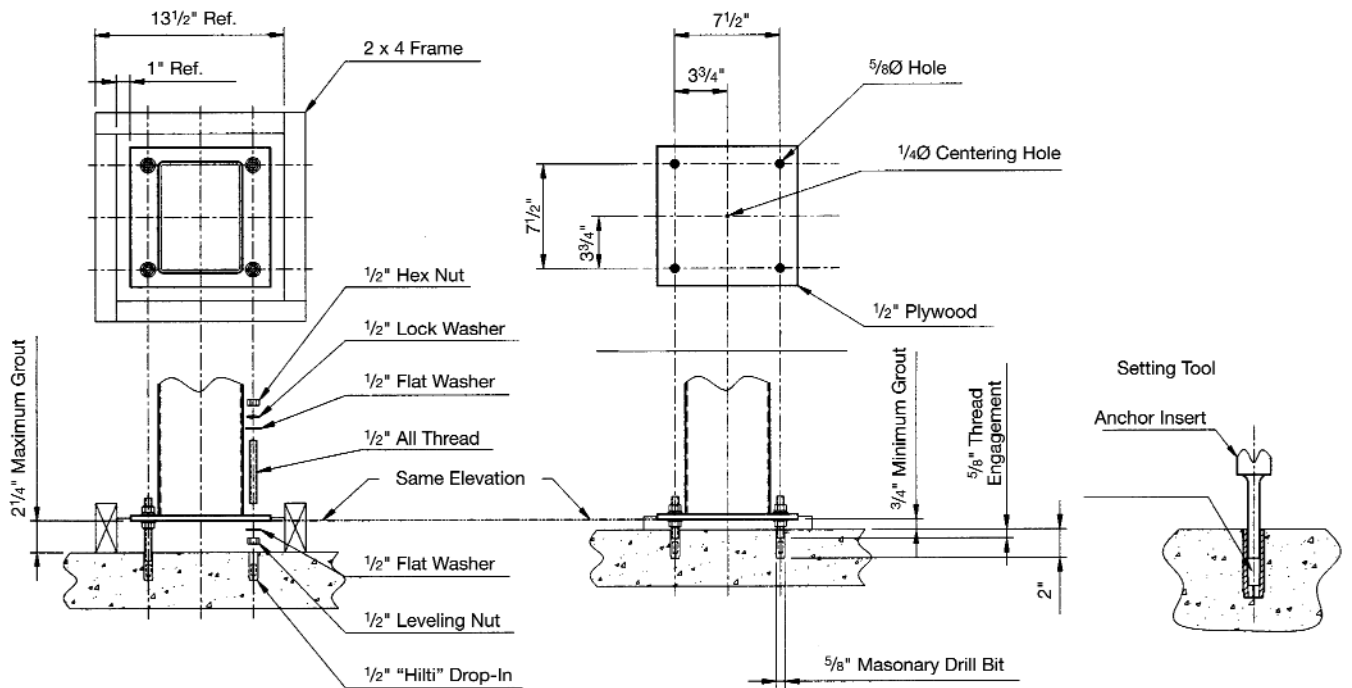


FIGURE 3

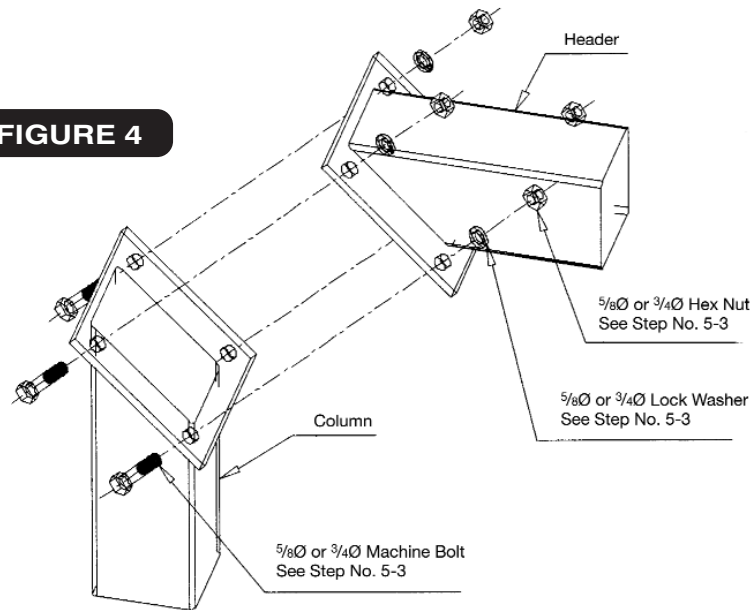
STEP 5 - INSTALLING COLUMNS AND HEADERS

1. Raise the first column, making sure the orientation of the diagonal plate above is in the correct direction. Secure it into place with the flat washer, lock washer and hex nut (See Figure 4). Tighten the hex nuts until fairly snug but do not do the final tightening at this stage. Without moving the leveling nut selected as a reference point in step 4 paragraph 6 (page 4 of this manual), adjust the others to bring the column into plumb. You can use a carpenter’s level to check this. Do this until the column is plumb and then tighten the top hex nuts until fairly snug. Remember there may be final adjustments to the hex nuts.
2. If the base plate is directly bolted to the concrete (no grout), columns can be initially plumbed using shims under the base plate.
3. After all the columns are set, start installing the headers. Raise and hold the header in its place between two columns and make the connections at the ends. Occasionally it may be necessary to loosen the top nuts on the column base plate to allow the header and the column to come into alignment. Secure the header to the column with the bolts, lock washer and hex nuts and tighten until fairly snug. See Figure 4. For bolt sizes, see chart below.

Column/Header Member	Quantity of Bolts	Bolt Size
8-inch X 6-inch	4	3/4" Diameter X 2 1/4" Long
6-inch X 6-inch	4	5/8" Diameter X 1 3/4" Long
5-inch X 5-inch	4	5/8" Diameter X 1 3/4" Long

4. Follow this procedure until all the headers are installed and the supporting frames are completed.
5. Check that all columns are plumb. Using a transit, a sight level, or a string level, verify that the elevations of the top of all the column base plates are within 1/8 inch in 20 feet. Adjust the column setting if necessary by using the leveling nuts. Once set, **tighten all connections making sure that lock washers are installed under the hex nut and flat washers are over all slotted holes.** See chart on page 13 for torque setting.

FIGURE 4



STEP 6 – THE RUNWAY TRACK INSTALLATION

1. **Be reminded** that for closed runway installations, install the crane before putting up the last section of runway track. For limited space, you will need the long wheel base end trucks as stated in step 2-2.
2. The runways are suspended from the support headers using clamp angles and $\frac{5}{8}$ -inch diameter bolts. Attach the clamp angles to the ends of the top tube of the runway using $\frac{5}{8}$ " x 5" bolts (2 required for each runway connection) as shown on *Figure 5*. Make sure there is a flat washer over each slotted hole and a lock washer under the hex nut. Set the hex nuts finger tight at this point.
3. Raise the runway and connect the angle clamps to the underside of the angle brackets of the header using $\frac{5}{8}$ " x 2" bolts (4 bolts for each runway connection) as shown on *Figure 6*. Make sure there is a flat washer over each slotted hole and a lock washer under the hex nut. Set the hex nuts finger tight at this point.
4. If the system has more than two support frames, it will require a runway splice connection. Prepare the runway same as above. The runway top tube at a splice connection will have a common clamp angle. Before attaching the second runway to the header, slide a splice coupler (see *Figure 6*) onto the track of either adjoining runway (completely in) and secure it temporarily with a set screw. Center the coupler at the splice after the runways are bolted on to the header angle brackets. Set the coupler adjusting screws to finger tight temporarily. Continue this until all the runways are installed.
5. Align the runway track and set them to the proper span. The span of the crane is the center-to-center distance between the two tracks, which is equal to the overall length of the crane less 2'-0" (see *Figure 2*). Align one side first. Alignment should be maintained to $\frac{1}{8}$ inch in 25 feet (see *Figure 8*). Make use of the slotted holes provided on the clamp angles and the angle support brackets for making the adjustments. When done, tighten enough bolts to prevent the runway track from shifting as you continue working. Align the second side. Tighten the bolts likewise. Check the track alignment at the splice points and **make sure that the bottom flanges of both adjoining tracks are aligned laterally and vertically** (see *Figure 7*). This joint must be flush to provide for a smooth transition. Use the top screws of the coupler to clamp down on the track and the screws on the side (do not over tighten) to make lateral adjustments. Make sure that all the screws are snug and then tighten the locking hex nuts on each screw. See chart on page 13 for torque setting.
6. Once set, **tighten all runway connections and anchor bolts making sure that lock washers are installed under the hex nut and flat washers are over all slotted holes**. See chart on page 13 for torque setting.

FIGURE 5
(Top Picture)

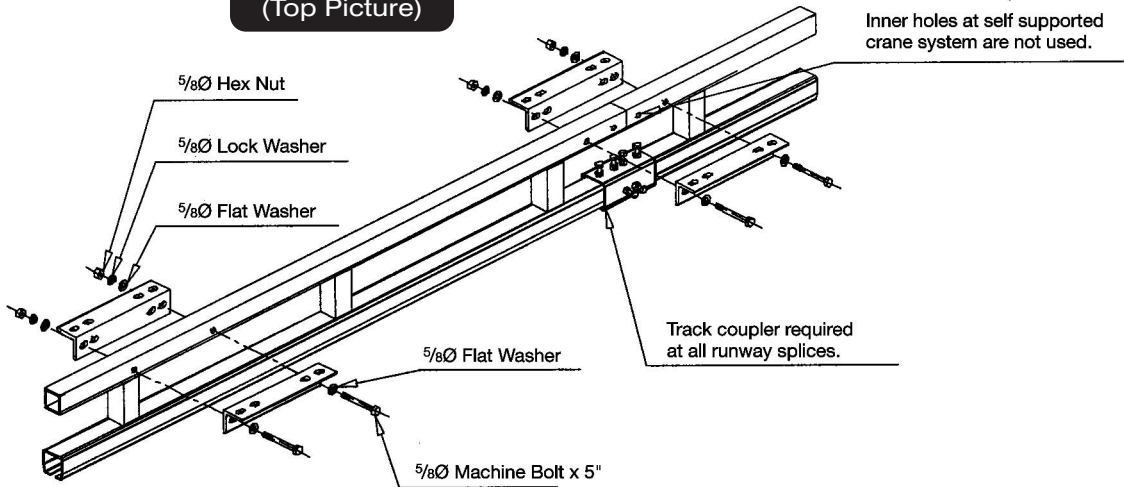


FIGURE 6
(Lower Picture)

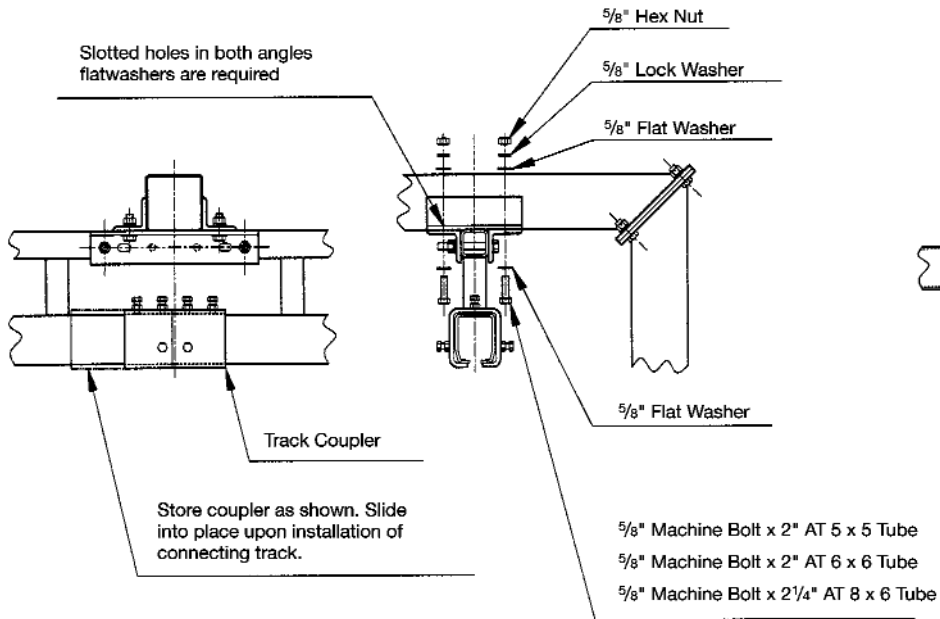


FIGURE 7

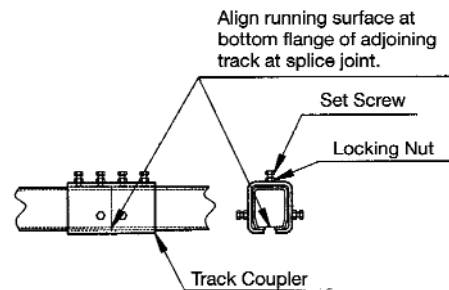
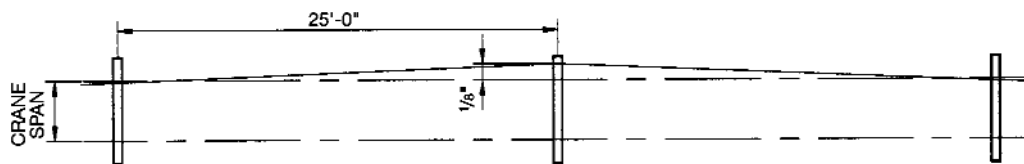


FIGURE 8



STEP 7 – CRANE ASSEMBLY AND INSTALLATION

(Make sure to read step 8 before installing the crane)

1. Assemble the crane on the floor. The ends of the bridge girder are prepared differently depending on the type of power supply and whether your system is manual or powered. See *Figure 9* and chart below.

Crane Power Supply	Bridge Girder End Condition
None	Both ends Identical (end stop hole 1½" from each end)
Conductor Bars	Both ends Identical (end stop hole 1½" from each end)
Festooning (Electric or Air)	End stop hole 1½" from one end, 1'-4½" minimum from other end

2. Trolleys for the festooning on the bridge girder will stack up at the end with the hole that is spaced farther from the end. Mark a point exactly 12 inches from this end of the bridge track. Mount the end truck with the set screws and center the end truck on the mark. For manual systems or for bridge girders with bar electrification, both ends are identical. Use the screws on the sides of the end truck coupler to square the bridge girder to the end truck (do not over tighten) and the screws on top for clamping down. Use a carpenter's square or take dimensions using symmetrical reference points on the end truck and the crane track. Make sure all the set screws are snug and then tighten hex nuts on set screws (see chart on page 13 for torque setting). Install the other end truck. Immediately install the bridge girder end stop (½" diameter bolt, hex nut, lock washer and rubber bumper) on to this end of the bridge girder to prevent the loose end truck from sliding off. See *Figure 9*. Check both end trucks to make sure all wheels are properly mounted and secure.
3. The fixed end truck will go on the runway that will have the runway electrification (see *Figure 2*). Raise the crane and slide it into the runway track. Immediately install the runway end stops (½" diameter bolt, hex nut, lock washer and rubber bumper) and the stack-up section (see step 2-3). If the last sections of the runways have not been installed (refer to step 2-1), securely tie off the crane at both ends to the runway. Check that the fixed end truck remains square to the bridge girder and readjust if necessary using the set screws on the end truck coupler. Re-tighten as per step 6-2 above.
4. Inspect the hoist trolley and make sure that the cotter pin is split and well wrapped around the bearing pin. See *Figure 9*. Install the trolley on the bridge girder from the fixed end. Immediately install the second bridge girder end stop. Install the correct quantity of festoon trolleys (if being used) from the fixed end and immediately install a Festoon Clamp Assembly on the end of the crane track making sure the bolts are tight (see chart on page 13 for torque setting).
5. For long wheel base end trucks (see *Figure 10*), assemble the end truck load bars onto the ends of the bridge girder following the same procedure for standard end trucks as described above in steps 7-2 through 7-3. Slide two end truck bogies into each runway and immediately install all the runway end stops and the stack-up section (see step 2-3). If there is sufficient space at one end of the system, the bogies can be mounted on the end truck load bars before sliding the crane onto the runway track (see step 2-2).
6. Raise the crane and hold it in position and make the connections of the end truck load bars to the bogies. Install the equalizer pin and the self-locking hex nut (see chart on page 13 for torque setting). See *Figure 10*. Complete the installation of the crane as described in step 7-4 above.
7. Install the correct quantity of festoon trolleys (if applicable) on the runway from the stack-up section. See *Figure 11*. Immediately install a Festoon Clamp Assembly on the end of the stack-up section making sure the bolts are tight (see chart on page 13 for torque setting).
8. Install the festooning (flat electrical cable) starting from a convenient point. The festooning is continuous from its connection point on the hoist to its final point at the end of the runway stack-up section, threaded through all the festoon trolleys and the end clamps. Space the trolleys every 6 feet of festoon cable on the runway and every 5 feet on the crane. Allow sufficient cable at each end to make the connections to the hoist and to end-user furnished electrical junction box, which should be installed within 24 inches of the conductor bars. Raise the festoon trolley saddle until festoon cable is firmly held.

FIGURE 9

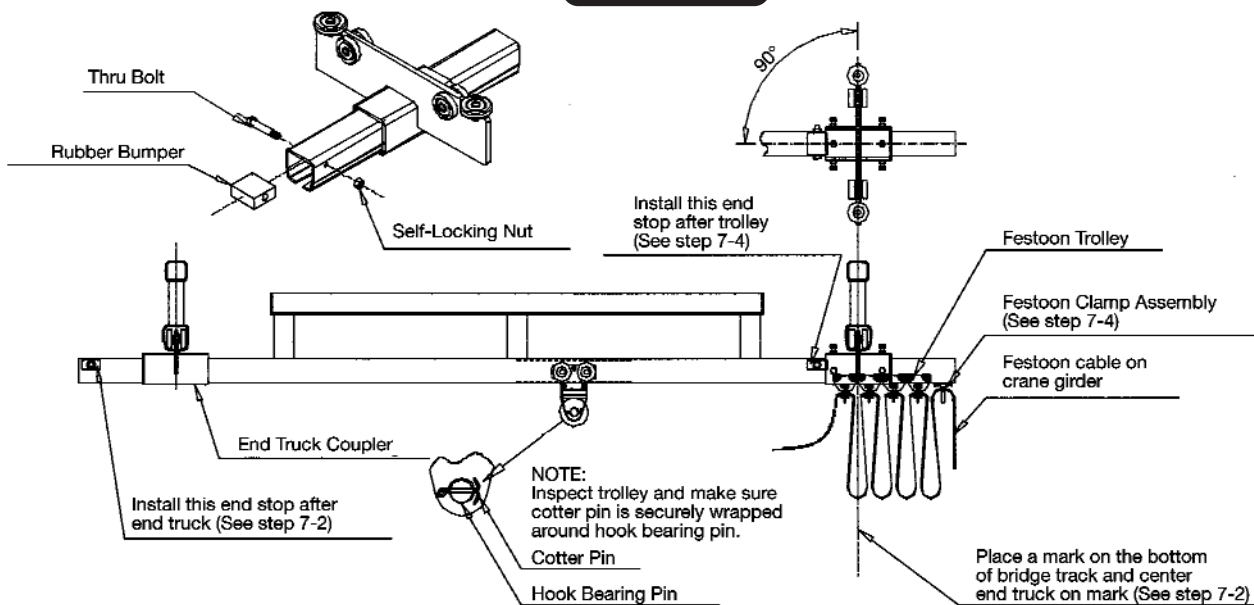


FIGURE 10

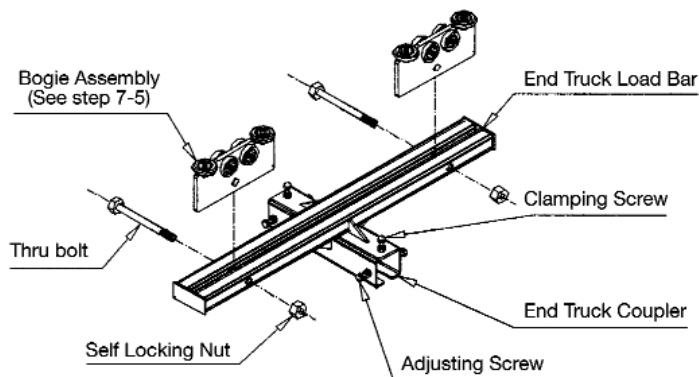
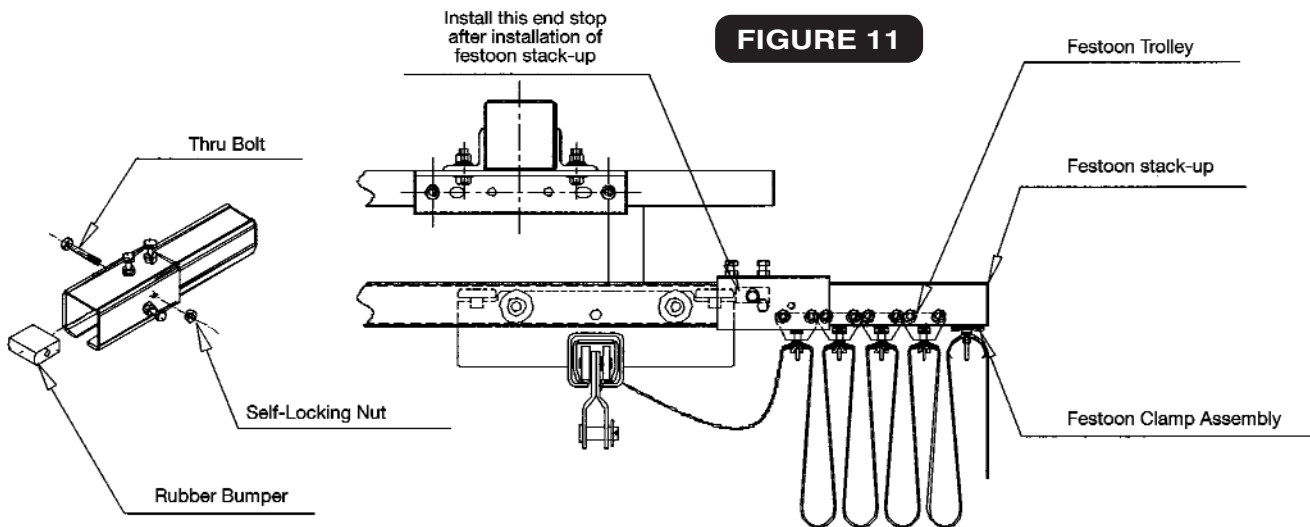


FIGURE 11



STEP 8 – SYSTEMS USING CONDUCTOR BARS

1. LodeRail systems can be powered electrically or pneumatically. Festooning is used for delivering electric and pneumatic power. The steps for installing this type of power supply are included above in steps 7-1 through 7-8. In lieu of flat cable electrification, electric conductor bars may be used on the runway, the crane, or on both.
2. Four conductors on the crane or on the runway are required by National Electric Code.
3. Install a conductor support bracket assembly every other vertical tube on the runway (*Figure 13*). Mount the conductor bars on the brackets covering the full length of the runway as per step 8-6 below. Slide on the collectors (with tow chains attached) on the conductors at any convenient point or time. Mount the tow arm on the end truck with screws (see chart on page 13 for torque setting). Attach the “S” hooks of the tow chains to the tow arms. Be sure to close the “S” hooks.
4. Install a conductor support bracket on every other vertical tube on the crane and a plain track type bracket at each end of the crane (see *Figure 14*). Mount the conductor bars on the brackets covering the full length of the crane as per step 8-6 below. Slide on the collectors (with tow chains attached) on the conductors at any convenient point or time. Mount the tow arm on the trolley with screws (see chart on page 13 for torque setting). Attach the “S” hooks of the tow chains to the tow arms. Move the trolley towards each end of the crane and set the adjustable end stops to keep the ends of the tow arm bracket 1 inch in from the ends of the track (see *Figure 14*). Be sure to tighten the bolts of the adjustable end stops (see chart on page 13 for torque setting).
5. Conductor bars are furnished in standard 10-foot sections with a joint clip on one end of the bar (see *Figure 13*). The end of the adjacent conductor slides into the joint clip and is pulled up tight with a joint tool (furnished with system). Slide hanger clips on bar. Secure the clip mounting bolt to the support bracket. Make sure the bar slides smoothly inside each hanger clip (until joining operation is completed). Slide on the joint cover over bar. Insert joint tool into the holes at ends of the bars. Draw the bars together until they butt. Slide cover over joint. Tighten all clamps and bolts (see chart on page 13 for torque setting).
6. Check all bolts and nuts making sure lock washers are installed under the hex nuts or bolts. See chart on page 13 for torque setting.

FIGURE 12

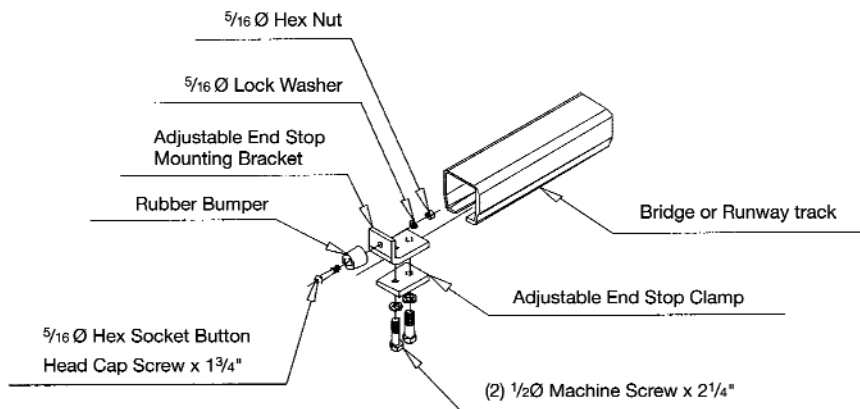


FIGURE 13
(Top Picture)

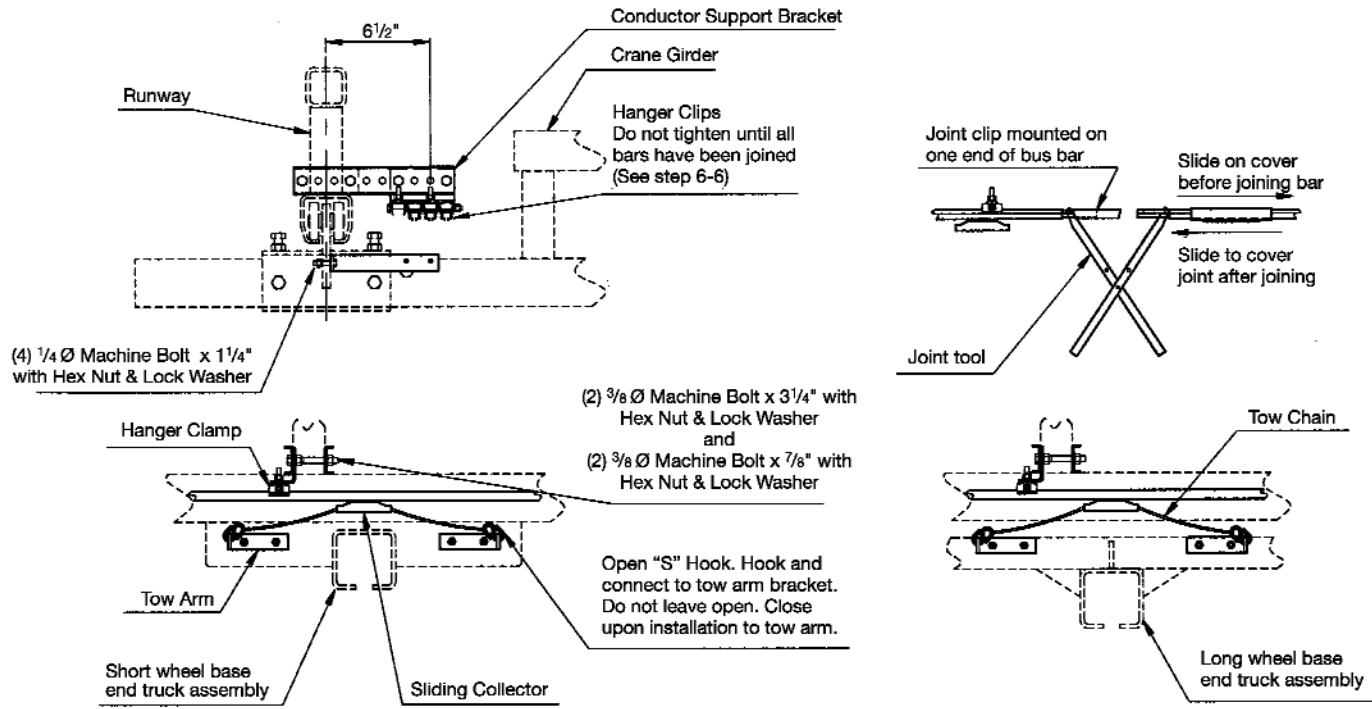
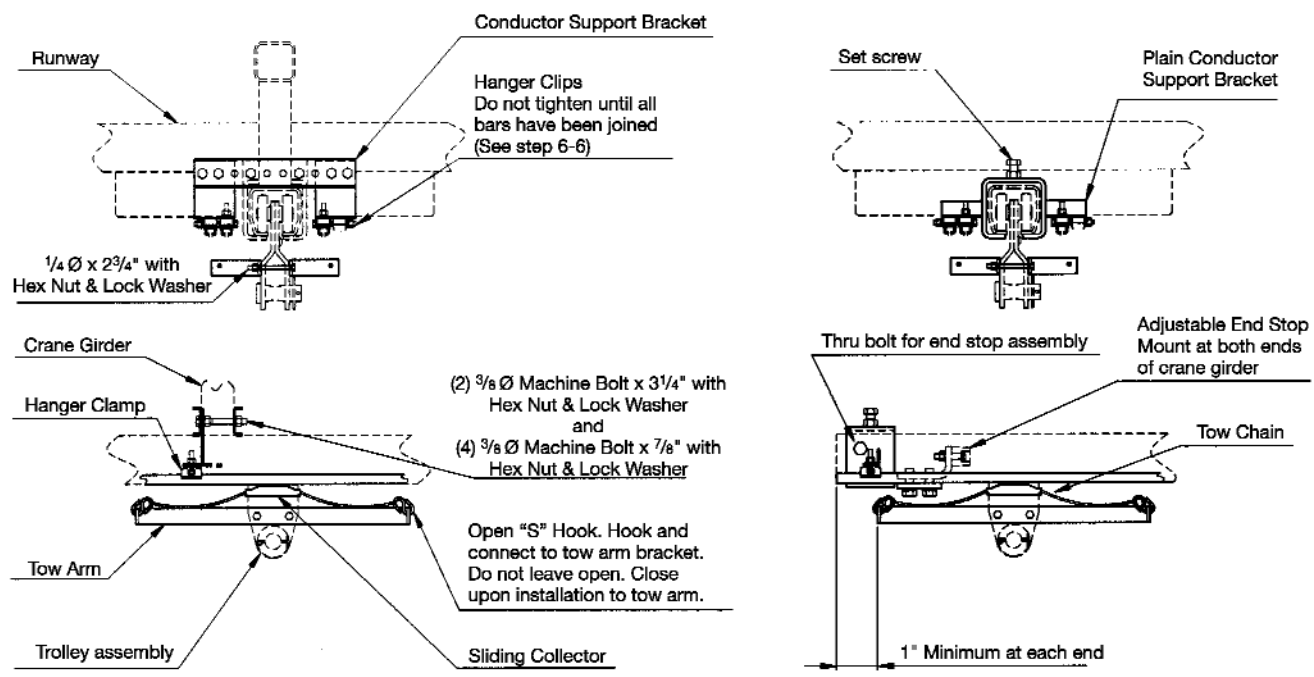


FIGURE 14
(Bottom Picture)



Truss Track Bracket

Plain Track Bracket
(See Truss Track for similar details)

STEP 9 – GROUT

1. If necessary, recheck runway alignment and column base plate elevations and make adjustments as needed.
2. Use a quick setting, non-metallic, cementitious structural type grout. Be sure to follow manufacturer's instructions.
3. Grout must be poured in place. **Do not dry pack.** One technique used for setting grout is to use wood forms all around the base plate (see *Figure 3*). Allow 1 inch of space all around the base plate edge. The system is transported using 2 x 4 dunnage material. This can be used for this purpose. Keep the wood form together with nails or by using adhesive tape such as duct tape. Tape the wood form to the concrete on the outside to prevent leakage. Following the manufacturer's instruction, prepare the grout and pour the mixture in until the grout rises to a point just below or level with the top of the base plate. Be sure that the mixture flows through the bottom of the base plate. This will ensure good bearing.
4. Remove the forms after grout has set.

STEP 10 – INSTALLING THE HOIST

Before installing the hoist, carefully read the manufacturer's instructions and manual. Contact the supplier of your hoist if you have any questions. It is extremely important to follow the correct procedure for installing your hoist.

The hoists used with the LodeRail systems are the hook mounted type (see *Figure 15*). The hoist will have a hook on the top of its body that mounts on the hook-bearing pin of the trolley. 250 to 2,000-pound capacity trolleys are single unit assemblies with four wheels. 4,000-pound capacity trolleys are made up of two 2,000-pound capacity trolleys and a pair of load bars. *Figure 15* shows the two styles and the location of the hook-bearing pin. **Hoist is to suspend from this pin only and not from any other part of the trolley.**

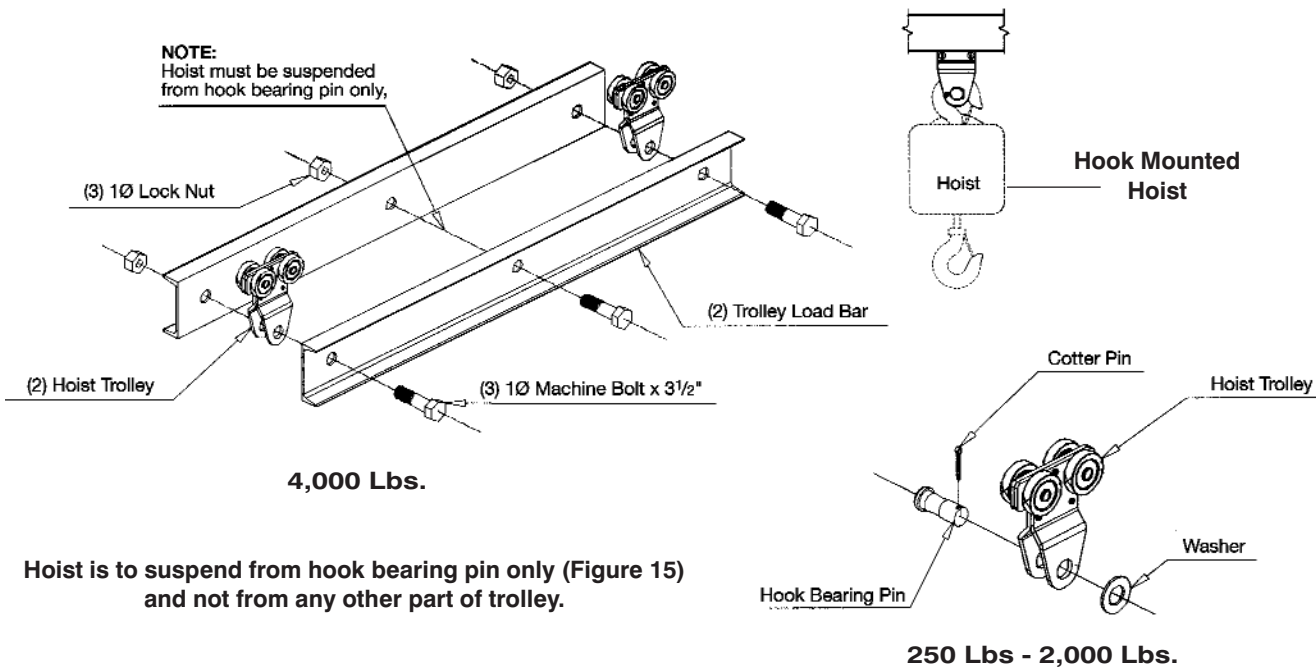


FIGURE 15

TORQUE SETTINGS

STEP NO.	LOCATION	BOLT SIZE	TORQUE SETTING
5-5	Header-Column Connection (up to 6x6)	5/8" diameter	150 Ft-Pounds
5-5	Header-Column Connection (8x6)	3/4" diameter	255 Ft-Pounds
6-6	Anchor Bolt Nuts	1/2" diameter	compress lock washer + 1/4 to 1/2 Turn
6-6	Runway Angle Clamp to Support Bracket	5/8" diameter	150 Ft-Pounds
6-6	Runway Angle Clamp to Track Top Tube	5/8" diameter	compress lock washer + 1/4 to 1/2 Turn
7-4	Bridge Girder Festoon End Clamp	5/16" diameter	compress lock washer + 1/4 to 1/2 Turn
7-7	Runway Festoon End Clamp	5/16" diameter	compress lock washer + 1/4 to 1/2 Turn
7-2	End Truck Coupler Set Screw Hex Nuts	1/2" diameter	1/4 to 1/2 Turn after full contact of hex nut
6-5	Runway Coupler Set Screw Hex Nuts	1/2" diameter	1/4 to 1/2 Turn after full contact of hex nut
7-2	Bridge Girder End Stop	1/2" diameter	self locking hex nut, 0" to 1/32" slack
7-3	Runway End Stop	1/2" diameter	self locking hex nut, 0" to 1/32" slack
7-6	Equalizer Pin (Bogies to Load Bar)	1" diameter	self locking hex nut, 0" to 1/32" slack
8-5	Adjustable End Stop on Bridge Girder	1/2" diameter	compress lock washer + 1/2 to 3/4 Turn
8-7	Conductor Brackets and Clamps	Assorted	1/4 to 1/2 turn after full contact of hex nut

CRANE OPERATION AND PERIODIC INSPECTION

FOR FREE STANDING LODERAIL

CRANE OPERATION

Overhead cranes are versatile machines that handle material overhead and can pick and place material within the crane's bridge length and runway length. However, to avoid accidents it is important that crane operators be qualified as well as properly trained and instructed regarding crane operation. The following information is provided as a guide to assist crane owners. Reference should also be made to ANSI/ASME B30.11 titled Monorails and Underhung Cranes, ANSI/ASME B30.16 titled Overhead Hoists (Underhung) and applicable OSHA regulations, state codes and local codes.

CRANE OPERATOR QUALIFICATIONS

Crane operators must meet the qualification requirements contained in ANSI/ASME B30.11. For floor operated equipment, operators are required to pass a practical operating examination with qualification limited to the specific equipment for which they were examined.

Attaching the Load

- Make certain that the hoist chain/rope is free of kinks and twists, and not wrapped around the load.
- Make sure load to be moved is directly under hoist and does not exceed hoist/crane capacity.
- Attach the load to the hoist load hook. Make sure load is applied to base or bowl of hook and not against hook latch.
- Make certain that load, hoist load hook, sling, and other attachments are clear of all obstacles.

Hoist Motion

Refer to the hoist manufacturers operating instructions and ANSI/ASME B30.16. Park empty hoist hook above head level to avoid personnel from bumping into hook.

Trolley Motion

Before moving the load, to avoid load swinging make sure hoist is directly over load. Always apply trolley motion slowly and reduce trolley speed gradually. Stay clear of load during movement.

Bridge Motion

Before moving the load, to avoid load swinging make sure hoist is directly over load. Always initiate bridge motion slowly. When approaching the location where the load is to be spotted, gradually reduce the bridge speed to zero.

GENERAL INFORMATION

- For proper crane operation, crane operators need to be familiar with the main parts of the crane and be thoroughly familiar with crane controls, crane functions, and crane movements. The operator should also know the location and be able to operate the main runway conductor disconnect means for all crane power.
- The crane operator is directly responsible for proper operation of the crane. Whenever there is a safety concern, the crane should be stopped and no load moved until the matter has been resolved to the operator's satisfaction. No person is to ride on the load or hook at any time.
- At the beginning of each shift, test the crane and any attachments by moving the crane trolley, bridge, and hoist and checking for proper operation. Observe for unusual motions and noises. Refer findings to appropriate supervisor.

OPERATING GUIDELINES

- Operate crane smoothly. Remove slack from slings and attachments before lifting load. Avoid jerky motions.
- Center load hook over load to avoid swinging of load. Lift only vertically from under crane hoist. Do not make side pulls.
- Make sure everyone is aware load is to be moved and is clear of load.
- Make sure load does not exceed capacity or working load limit of hoist, crane, sling or other attachments.
- Before moving the load, verify that load sling or other load attachment is fully seated in hook bowl/saddle and that hook latch is closed.

- When moving the load make sure the load clears all potential obstructions while keeping the load as near the floor as possible. This will enhance load control while minimizing the hazard of the suspended load.
- When approaching runway and trolley stops, approach them slowly with caution to avoid impact loading.
- Always be aware of others in the area of the crane and advise others of the intention to operate the crane to move the load.
- Do not leave a suspended load unattended. When a load is suspended, the crane controls should be in the operator's possession.
- Minimize the potential of snagging by securing loose sling hooks and attachments. Also, remove slings and attachments from crane hoist hook when not in use. Dangling hooks can snag objects when moving empty crane hoist hook.
- Do not carry loads or empty crane hoist hooks over personnel. Use extreme caution when using magnet and vacuum devices. Power loss can result in load loss.
- Observe the following when leaving the crane unattended:
 - Raise hook(s) to a position above head level to prevent personnel from coming in contact with hooks.
 - Spot the crane at an approved designated location.
 - Place all controls in "off" position.
 - Make sure main power switch is in "off" position.
 - Observe area before leaving to make certain area is secure.
- During any and all maintenance or in the event of an emergency, warning signs or signals should be displayed and the main line disconnect switch locked in the off position per ANSI Z244.1.

**FOR ADDITIONAL INFORMATION
READ AND OBSERVE ANSI/ASME B30.11 AND B30.16 AND
HOIST MANUFACTURERS MANUAL.**

PERIODIC INSPECTION

Every 2000 hours of crane operation or yearly, perform a close visual inspection of the entire crane assembly. Pay particular attention to the items cited in the following torque settings Table.

TORQUE SETTINGS

INSTALLATION STEP NO.	LOCATION	BOLT SIZE	TORQUE SETTING
5-5	Header-Column Connection (up to 6x6)	5/8" diameter	150 Ft-Pounds
5-5	Header-Column Connection (8x6)	3/4" diameter	255 Ft-Pounds
6-6	Anchor Bolt Nuts	1/2" diameter	compress lock washer + 1/4 to 1/2 Turn
6-6	Runway Angle Clamp to Support Bracket	5/8" diameter	150 Ft-Pounds
6-6	Runway Angle Clamp to Track Top Tube	5/8" diameter	compress lock washer + 1/4 to 1/2 Turn
7-4	Bridge Girder Festoon End Clamp	5/16" diameter	compress lock washer + 1/4 to 1/2 Turn
7-7	Runway Festoon End Clamp	5/16" diameter	compress lock washer + 1/4 to 1/2 Turn
7-2	End Truck Coupler Set Screw Hex Nuts	1/2" diameter	1/4 to 1/2 Turn after full contact of hex nut
6-5	Runway Coupler Set Screw Hex Nuts	1/2" diameter	1/4 to 1/2 Turn after full contact of hex nut
7-2	Bridge Girder End Stop	1/2" diameter	self locking hex nut, 0" to 1/32" slack
7-3	Runway End Stop	1/2" diameter	self locking hex nut, 0" to 1/32" slack
7-6	Equalizer Pin (Bogies to Load Bar)	1" diameter	self locking hex nut, 0" to 1/32" slack
8-5	Adjustable End Stop on Bridge Girder	1/2" diameter	compress lock washer + 1/2 to 3/4 Turn
8-7	Conductor Brackets and Clamps	Assorted	1/4 to 1/2 turn after full contact of hex nut

LodeRail™ Warranty

Columbus McKinnon warrants each new LodeRail system manufactured by it to be free from defects in material and workmanship under normal use and service. This warranty is limited to making good at Columbus McKinnon's factory any LodeRail which shall, within five (5) years commencing on the date of delivery to the original purchaser, be returned to Columbus McKinnon with transportation charges prepaid and which, upon Columbus McKinnon's examination, shall appear to Columbus McKinnon's satisfaction to have been defective. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF COLUMBUS McKINNON, AND COLUMBUS McKINNON NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY LIABILITY IN CONNECTION WITH THE SALE OF LODERAIL.

LodeRail™

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