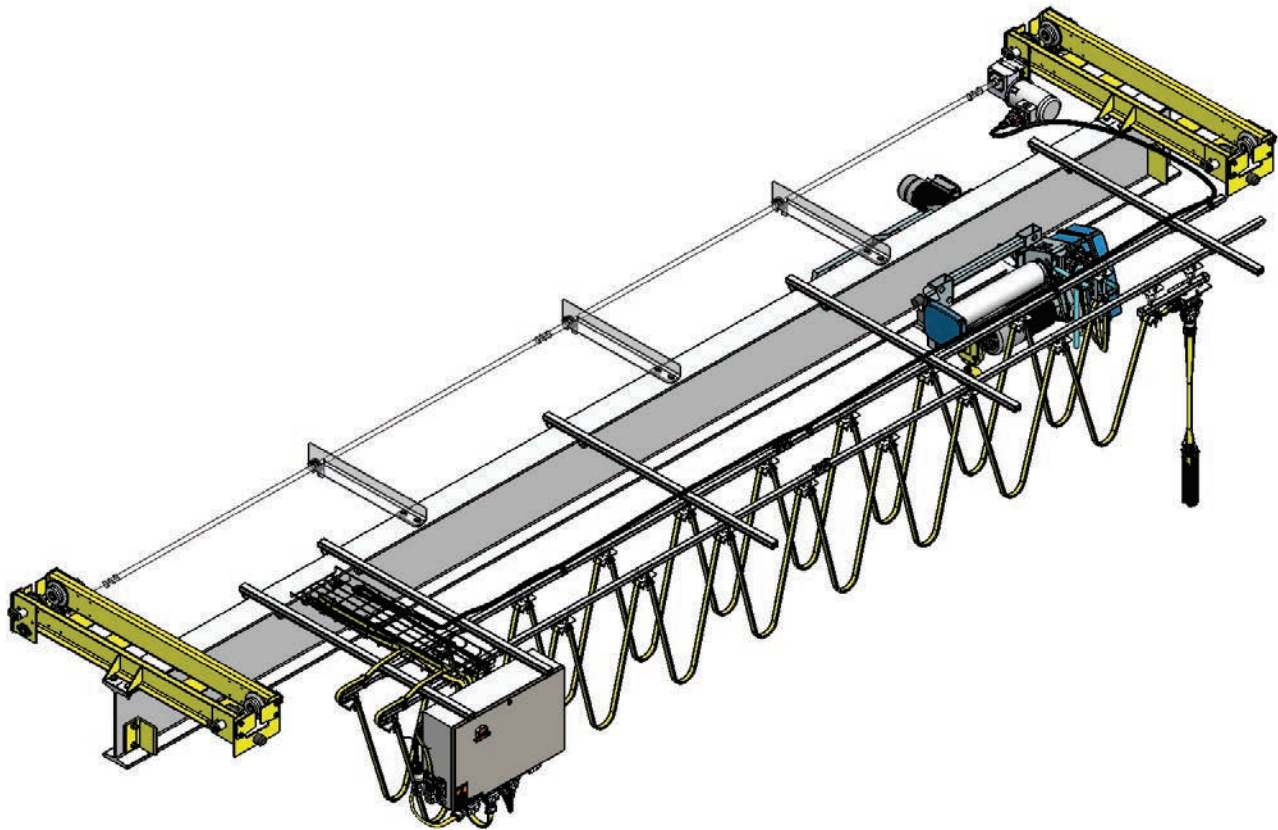


**UHSG ASSEMBLY  
INSTRUCTION MANUAL**

**P/N: C11746310**

**Yale<sup>®</sup> SHAW-BOX<sup>®</sup>**  
**YK<sup>™</sup> & SK<sup>™</sup>**

**CRANE KIT ASSEMBLY INSTRUCTION MANUAL**



[www.columbusmckinnon.com](http://www.columbusmckinnon.com)

**P/N: C11746310 REV. AA November 2020**

# TABLE OF CONTENTS

<b>1) SAFETY PRECAUTIONS .....</b>	<b>5</b>
IMPORTANT INFORMATION AND WARNINGS.....	6
<b>2) FABRICATION OF GIRDER(S) FOR BRIDGE BEAM     WITH CAPPING CHANNEL (AS REQUIRED) .....</b>	<b>9</b>
STEP 1: CUT GIRDER AND C-CHANNEL (AS REQUIRED).....	10
STEP 2: CHECK CAMBER (AS REQUIRED).....	10
STEP 3: GIRDER AND C-CHANNEL WELDING AT END (AS REQUIRED).....	11
STEP 4: CLAMPING GIRDER AND C-CHANNEL (AS REQUIRED).....	11
STEP 5: GIRDER AND C-CHANNEL WELDING (AS REQUIRED).....	12
STEP 6: CHECK CAMBER AFTER WELDING (AS REQUIRED).....	12
<b>3) ASSEMBLING BRIDGE GIRDER TO UNDERHUNG END TRUCKS.....</b>	<b>13</b>
3.A) PLAN VIEW .....	14
3.B) DIMENSION DETAILS FOR GIRDER LENGTH CALCULATION .....	15
3.C) UNDERHUNG END TRUCK TYPES.....	16
3.D) FORMED CHANNEL END TRUCK .....	17
3.E) ROLLED CHANNEL END TRUCK.....	18
STEP 1: BRIDGE GIRDER LENGTH (AS REQUIRED) .....	19
STEP 2: MARKING CENTERLINE ON THE GIRDER (AS REQUIRED) .....	19
STEP 3: MARKING CENTERLINES AND HOLE LOCATIONS ON END TRUCK – UHFC .....	20
STEP 3A: MARKING CENTERLINES AND HOLE LOCATIONS ON END TRUCK – UHRC.....	21
STEP 4: LOCATE & ALIGN END TRUCKS – UHFC .....	22
STEP 4A: LOCATE & ALIGN END TRUCKS – UHRC .....	23
STEP 5: CHECK SQUARENESS BETWEEN END TRUCKS .....	24
STEP 6: CHECK SPAN (CENTER TO CENTER) OF END TRUCKS .....	24
STEP 7: DRILLING HOLES ON END TRUCKS AND GIRDER FLANGE – UHFC .....	25
STEP 7A: DRILLING HOLES ON END TRUCKS AND GIRDER FLANGE – UHRC .....	26
STEP 8: ASSEMBLE GIRDER TO END TRUCKS – UHFC.....	27
STEP 8A: ASSEMBLE GIRDER TO END TRUCKS – UHRC.....	28
STEP 9: END STOP INSTALLATION.....	29
STEP 10: ASSEMBLING MOTOR AND GEAR REDUCER WITH END TRUCK .....	30
STEP 10A: UHRC END TRUCK A4 DRIVE INSTALLATION.....	31

## TABLE OF CONTENTS

STEP 11: ASSEMBLING GROOVE PIN WITH END TRUCK AND SUPPORT BRACKET .....	32
STEP 12: LOCATE AND DRILL HOLES FOR CROSS ARM SUPPORT.....	33
STEP 13: MOUNTING CROSS SHAFT SUPPORT .....	34
STEP 14: MOUNTING CROSS SHAFT, BEARING AND COUPLING ON CROSS SHAFT SUPPORT .....	35
STEP 15: CHECKING HORIZONTAL ALIGNMENT OF THE CROSS SHAFT .....	36
STEP 16: ASSEMBLING COUPLING WITH CROSS SHAFT.....	37
<b>4) END STOP ASSEMBLY .....</b>	<b>38</b>
4.A) END STOP ASSEMBLY.....	39
<b>5) MOUNTING HOIST ON GIRDER.....</b>	<b>40</b>
STEP 1: PREPARATION FOR MOUNTING HOIST ON GIRDER .....	41
STEP 2: MOUNTING HOIST ON GIRDER.....	42
<b>6) FESTOON SYSTEM INSTALLATION.....</b>	<b>43</b>
6.A) PLAN VIEW .....	44
STEP 1: CLAMPING CROSS ARM & CONTROL BOX SUPPORT RAILS .....	45
STEP 2: SPACING FOR CROSS ARMS/SUPPORT RAILS .....	45
STEP 3: C-RAIL MOUNTING.....	46
STEP 4: C-RAIL JOINT ASSEMBLY .....	47
STEP 5: MOUNTING BRIDGE PANEL .....	48
STEP 6: END STOP ASSEMBLY.....	49
STEP 7: HOIST CABLE ASSEMBLY.....	50
STEP 8: CONTROL PENDANT CABLE ASSEMBLY .....	51
STEP 9: TOW ARM KIT PREPARATION .....	52
STEP 10: TOW ARM KIT PREPARATION .....	53
STEP 11: CABLE TRAY INSTALLATION .....	54
STEP 12: PLACING FESTOON CABLES ON CABLE TRAY .....	55
STEP 13: FESTOON CABLE CONNECTION .....	56
STEP 14: PUSH-BUTTON PENDANT ASSEMBLY .....	57
STEP 15: BRIDGE MOTOR CABLE CONNECTION .....	58
STEP 16: BRIDGE TOW ARM INSTALLATION.....	59

## TABLE OF CONTENTS

STEP 17: BRIDGE TRAVEL LIMIT SWITCH INSTALLATION .....	60
STEP 18: FESTOON RUNWAY CHECKING .....	61
STEP 19: ADDING CABLE TIES .....	61
<b>7) RADIO CONTROL &amp; HORN INSTALLATION FOR FESTOON SYSTEM.....</b>	<b>62</b>
STEP 1: CROSS ARM & BRACKET INSTALLATION FOR RADIO CONTROL.....	63
STEP 2: RADIO CONTROL SYSTEM INSTALLATION .....	64
STEP 3: HORN INSTALLATION (INTERNAL/EXTERNAL).....	65
<b>8) WARRANTY .....</b>	<b>67</b>





# CHAPTER 1


## SAFETY PRECAUTIONS

### Safety Alert Symbols

Throughout this manual are steps and procedures that can prevent hazardous situations; the following symbols are used to identify the degree or level of hazard seriousness.

DANGER, WARNING, CAUTION AND NOTICE

<u>Symbol</u>	<u>Description</u>
	<p><b>Danger</b></p> <p>Indicates an imminently hazardous situation which, if not avoided, <b>will result in death or serious injury</b> and property damage.</p>
	<p><b>Warning</b></p> <p>Indicates an imminently hazardous situation which, if not avoided, <b>could result in death or serious injury</b> and property damage.</p>
	<p><b>Caution</b></p> <p>Indicates a potentially hazardous situation which, if not avoided, <b>may result in minor or moderate injury</b> and property damage.</p>
	<p><b>Notice</b></p> <p>Notifies people of installation, operation or maintenance information which is important but not directly hazard-related.</p>

 **WARNING**

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

# IMPORTANT INFORMATION AND WARNINGS

- ✓ Failure to read and comply with any of the limitations noted herein can result in serious bodily injury or death, and/or property damage.
- ✓ Equipment described in this manual is not designed for and should not be used for lifting, supporting, or transporting humans.
- ✓ To ensure the good working order and reliable operation of your hoist, strictly adhere to the requirements of the installation provided in this manual.
- ✓ Strictly adhere to the requirements for safe operation to prevent dangers to personnel and damages to the electric hoist.
- ✓ When making repairs, only use parts supplied by the manufacturer.
- ✓ The connection of the bridge panel power cable with the crane runway power supply shall only be performed by a qualified electrician.
- ✓ Assembly and commissioning of the crane system shall only be done by qualified persons authorized by CMCO.
- ✓ Modifications to upgrade, re-rate, or otherwise alter this equipment shall be authorized only by the original equipment manufacturer or qualified professional engineer.
- ✓ Equipment described in this manual may be used in the design and manufacture of cranes. Additional equipment or devices may be required for the crane to comply with applicable crane design and safety standards. The crane designer, crane manufacturer, or user is responsible for finishing these additional items for compliance. Refer to ASME B30.11 Safety Standard for Underhung Cranes. If a below-the-hook lifting device or sling is used with a hoist, refer to ASME B30.9, Safety Standard for Slings, or ASME B30.20, Safety Standard for Below-the-Hook Lifting Devices.
- ✓ Hoists and cranes used to handle hot molten material may require additional equipment or devices. Refer to ANSI Z241.2, Safety Requirements for Melting and Pouring of Metals in the Metal Casting Industry.
- ✓ The hoists are not designed to operate in a chemically aggressive and explosive environment.

**Working in or near exposed energized electrical equipment presents the danger of electric shock.**

## **▲ WARNING**

Before installing, removing inspecting, or performing any maintenance on a hoist, the main switch shall be de-energized. Lock and tag the main switch in the de-energized position in accordance with ANSI Z244.1.

Follow other maintenance procedures outlined in this manual and applicable ASME B30 volumes.

Additional WARNINGS are listed in various portions of this manual. Personnel shall read and follow these WARNINGS. Failure to read and comply with these WARNINGS as well as other instructions or any limitations noted in this manual and applicable ASME B30 volumes could result in serious bodily injury or death, and/or property damage.

- ✓ Read and observe the instructions and warnings contained in this manual. Read and observe any instructions and warning tags attached to the hoist.
- ✓ Check for any damage to the components during shipment. If any damage has occurred, place a claim with the carrier. DO NOT install a damaged components.
- ✓ Check wire rope for damage and proper spooling on the drum. Be sure rope is properly seated in drum grooves and sheaves. Tightly secure both of the rope ends.
- ✓ After each rope replacement as well as after repair and reassembling of the electric hoist, check the phasing and direction of operation. Verify the hook position of all limit switches per the hoist manual.
- ✓ Be certain that power supply to the bridge control panel has the same voltage, frequency, and phase specified on the bridge control panel nameplate.
- ✓ While performing electric repairs/maintenance, make sure that there is no load on the hook; turn off the power supply switch and prevent unauthorized personnel from switching it on.
- ✓ Check the loading hook for cracks and deformations. Verify the proper operation of the release latch.
- ✓ The bridge frame shall not be considered electrically grounded through the end truck wheels and its respective tracks. A separate runway bonding conductor must be provided.

### **⚠ WARNING**

Hazardous voltages are present in the control enclosure, other electrical components, and connections between these components.

Before performing any mechanical or electrical maintenance on the equipment, disconnect the main switch supplying power to the equipment and implement lockout/tagout procedure. Refer to ANSI Z244.1, personnel protection - lockout/tagout of energy sources.

DO NOT operate the equipment without control enclosure cover or covers in place.

Only trained and competent personnel should inspect and repair this equipment.

- ✓ If hoist has a trolley, check that the crane bridge beam is level, straight, and clean. Check that trolley stops are installed, or install trolley stops, at the open end or ends of the beam to prevent the trolley from traveling off the beam. Avoid using trolley stops that engage trolley wheels. Check that trolley stops will prevent overhanging parts of the hoist and trolley from interfering with other equipment beyond the ends of the beam.
- ✓ Daily, before starting work, check the operation of the brake and the limit switch.
- ✓ Never use a limit switch as an operational switches.
- ✓ Do not leave the lifted load out of sight.
- ✓ Do not exceed the rated capacity.
- ✓ Do not lift loads at an angle and do not drag them.
- ✓ Do not try to detach firmly fixed loads (for example, loads frozen to the ground).
- ✓ Do not change or modify the electric diagram. Do not use the pushbuttons and limit switches for other purposes other than those mentioned in this manual.
- ✓ Equipment covered herein is not designed or suitable as a power source for lifting or lowering persons. Never lift and move loads over personnel.
- ✓ Use warning signs and barriers on the floor beneath the crane or area where the hoist will be installed.

### **▲ WARNING**

Damage to the hoist, a dropped load, and injury may result if limit switches fail due to improper use. Under normal operating conditions, stop hoist travel before engaging limit switches. Limit switches are safety devices and should not be used as normal operating control.

### **▲ WARNING**

Only qualified personnel with proper supervision shall install the hoist on the monorail and perform the final pre-operation inspection.

Before installing, removing, inspecting, or performing any maintenance on a hoist, the main switch shall be de-energized. Lock and tag the main switch in the de-energized position in accordance with ANSI Z244.1.

Follow other maintenance procedures outlined in the manual and applicable ASME B30 volumes.

Additional WARNINGS are listed in various portions of this manual. Personnel shall read and follow these WARNINGS. Failure to read and comply with these WARNINGS as well as other instructions or any limitations noted in this manual and applicable ASME B30 volumes could result in serious bodily injury or death, and/or property damage.

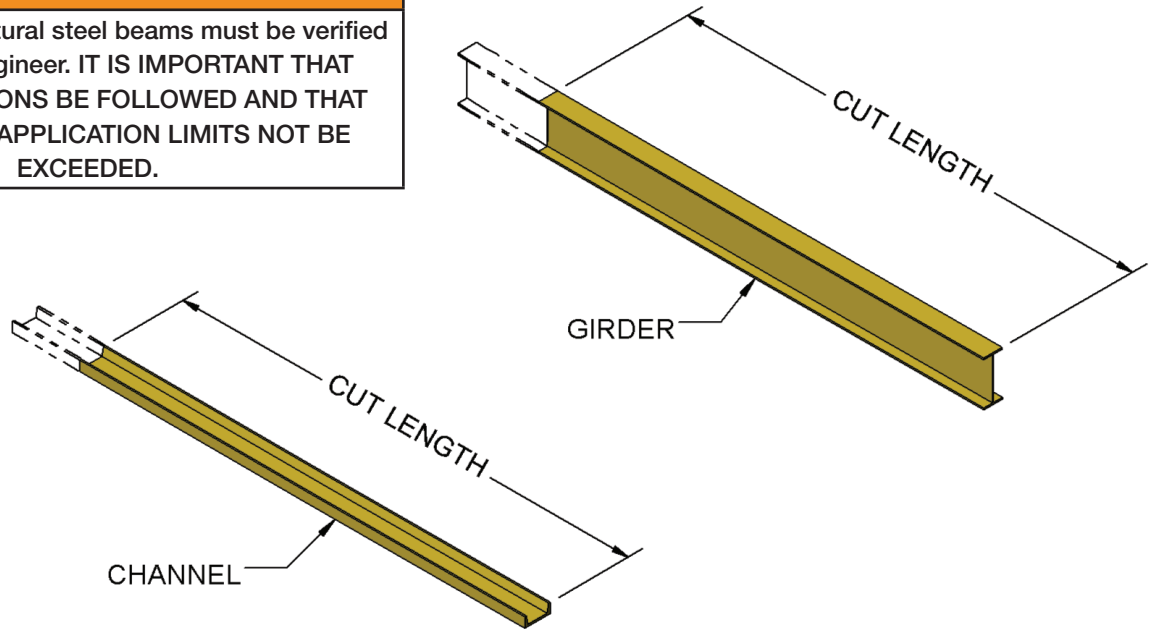


**CHAPTER 2**  
**FABRICATION OF GIRDER(S)**  
**FOR BRIDGE BEAM WITH**  
**CAPPING CHANNEL**  
**(AS REQUIRED)**

## STEP 1: CUT GIRDER AND C-CHANNEL (AS REQUIRED)

### **⚠ WARNING**

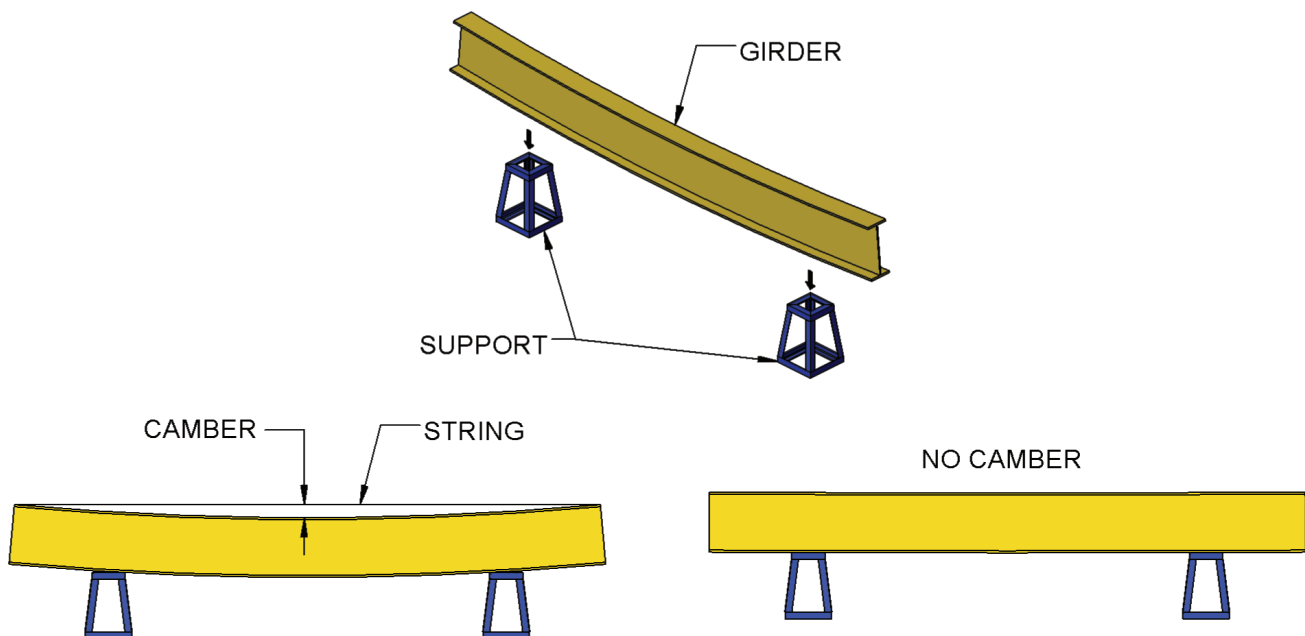
Selection of structural steel beams must be verified by qualified engineer. IT IS IMPORTANT THAT ALL INSTRUCTIONS BE FOLLOWED AND THAT COMPONENT APPLICATION LIMITS NOT BE EXCEEDED.



Check your configuration to see if a capping channel is required.

CUT LENGTH TO BE DETERMINED BY SPAN LENGTH

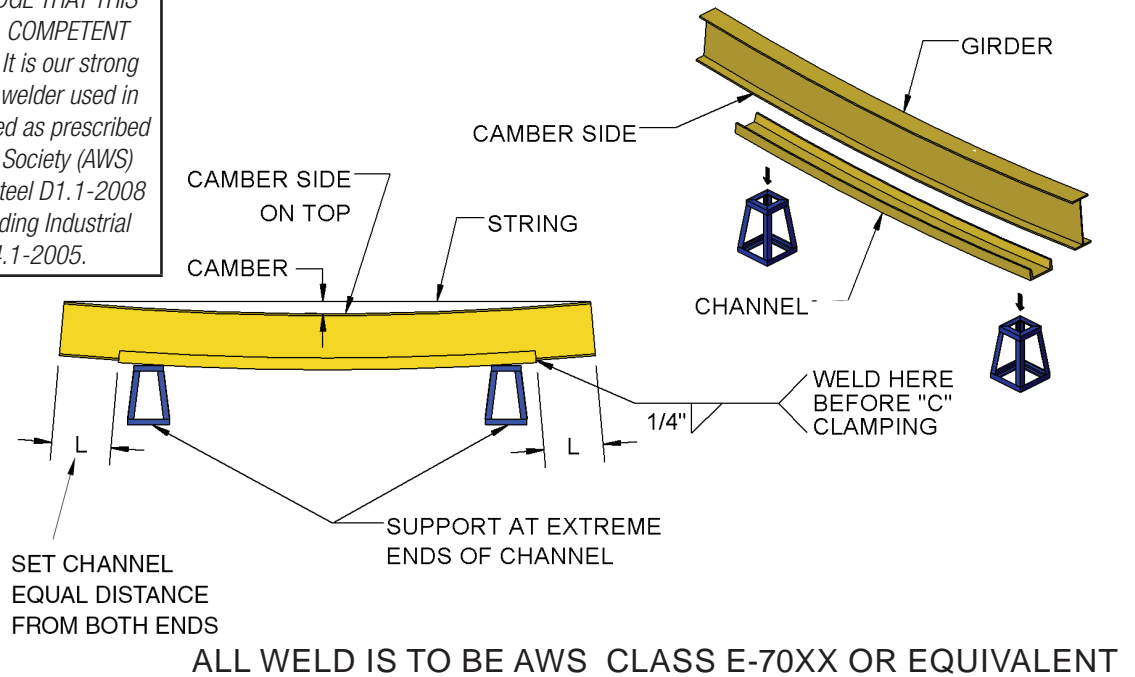
## STEP 2: CHECK CAMBER (AS REQUIRED)



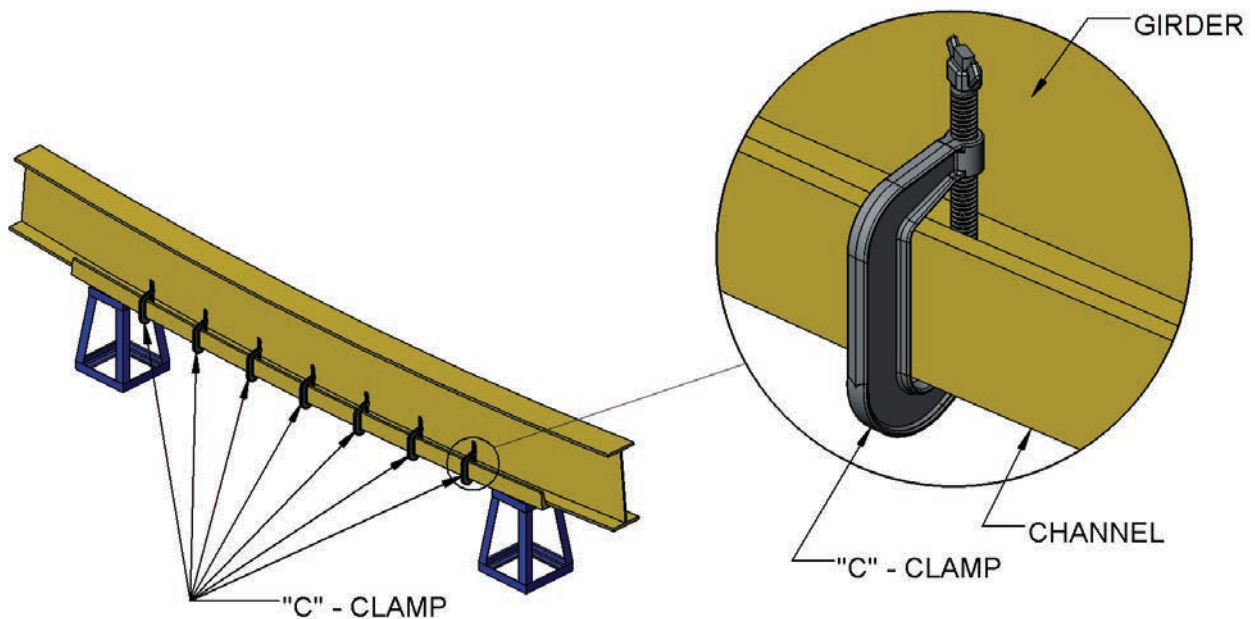
## STEP 3: GIRDER AND C-CHANNEL WELDING AT END (AS REQUIRED)

### NOTICE

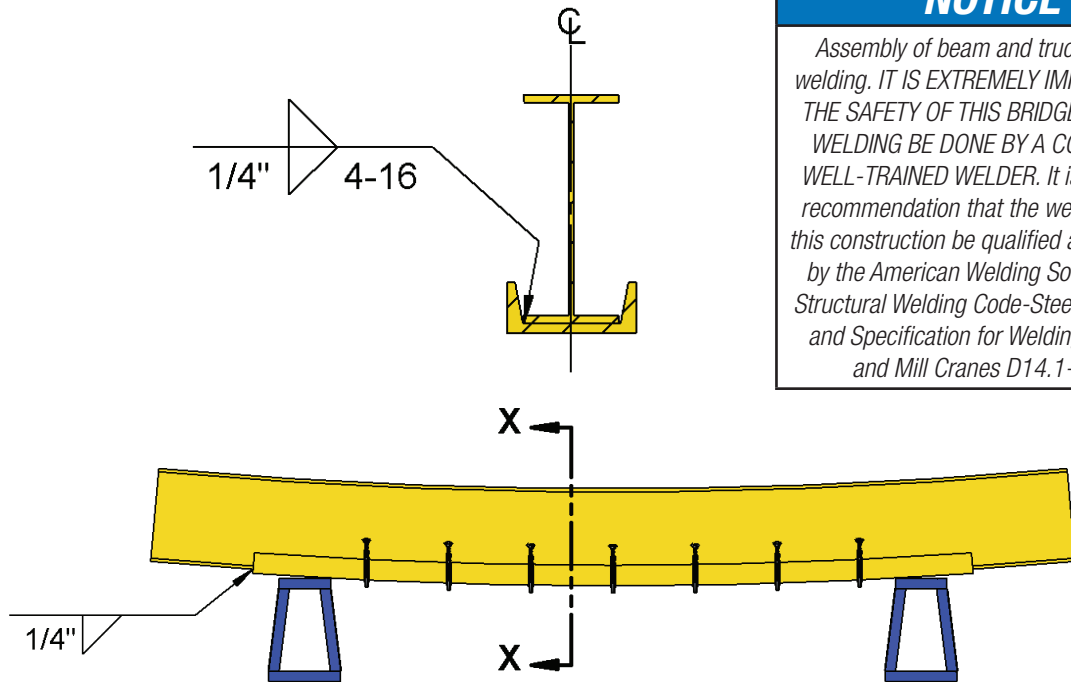
Assembly of beam and truck requires welding. IT IS EXTREMELY IMPORTANT TO THE SAFETY OF THIS BRIDGE THAT THIS WELDING BE DONE BY A COMPETENT WELL-TRAINED WELDER. It is our strong recommendation that the welder used in this construction be qualified as prescribed by the American Welding Society (AWS) Structural Welding Code-Steel D1.1-2008 and Specification for Welding Industrial and Mill Cranes D14.1-2005.



## STEP 4: CLAMPING GIRDER AND C-CHANNEL (AS REQUIRED)



## STEP 5: GIRDER AND C-CHANNEL WELDING (AS REQUIRED)

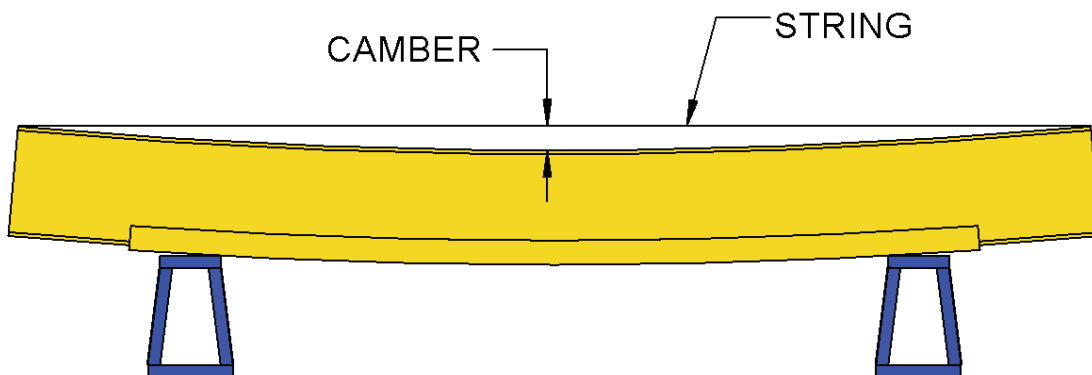


### NOTICE

Assembly of beam and truck requires welding. IT IS EXTREMELY IMPORTANT TO THE SAFETY OF THIS BRIDGE THAT THIS WELDING BE DONE BY A COMPETENT WELL-TRAINED WELDER. It is our strong recommendation that the welder used in this construction be qualified as prescribed by the American Welding Society (AWS) Structural Welding Code-Steel D1.1-2008 and Specification for Welding Industrial and Mill Cranes D14.1-2005.

ALL WELD IS TO BE AWS CLASS E-70XX OR EQUIVALENT

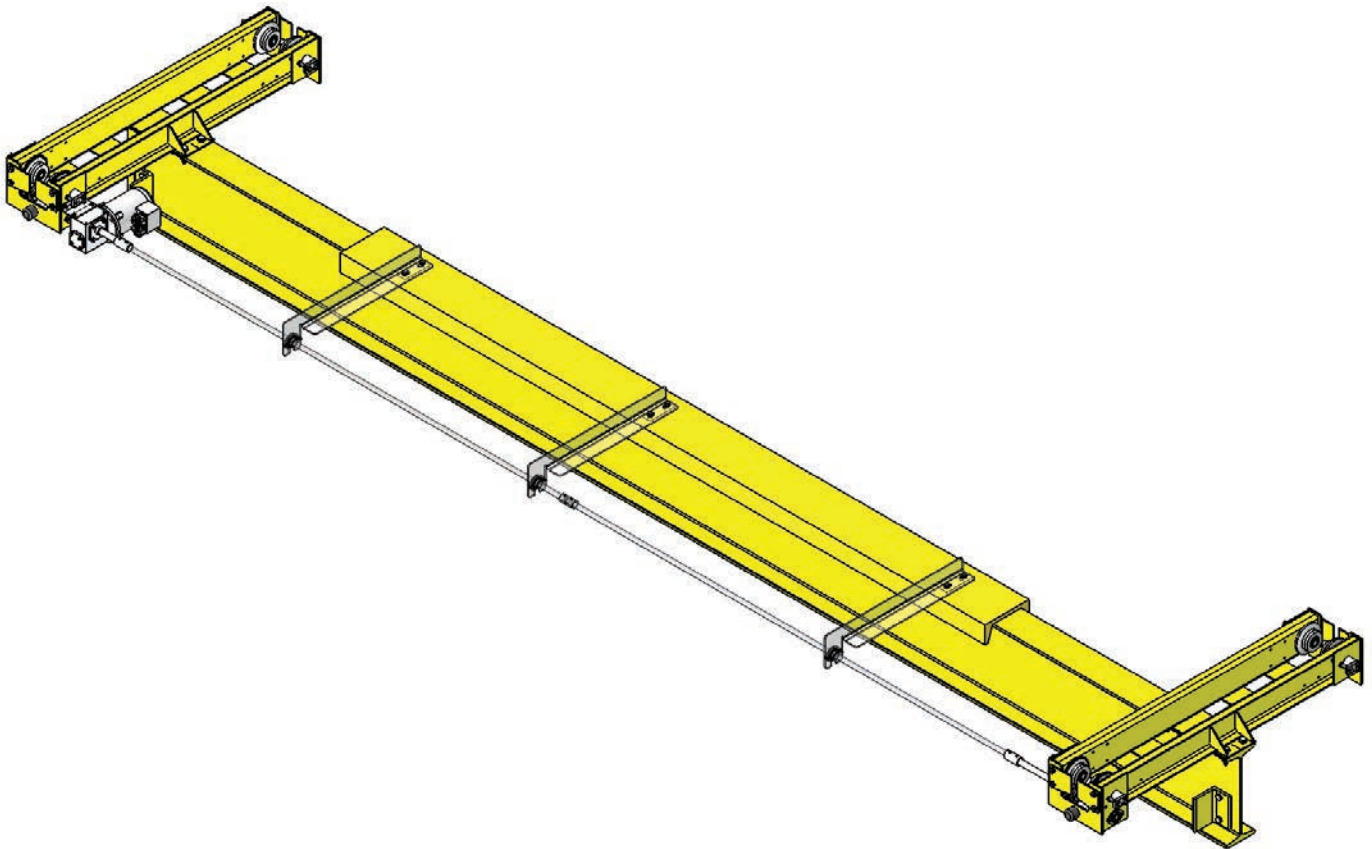
## STEP 6: CHECK CAMBER AFTER WELDING (AS REQUIRED)



$$\text{CAMBER} \leq \{ \text{DEFLECTION OF GIRDER AT DEAD LOAD} + 1/2 * \text{DEFLECTION OF GIRDER AT LIVE LOAD} \}$$

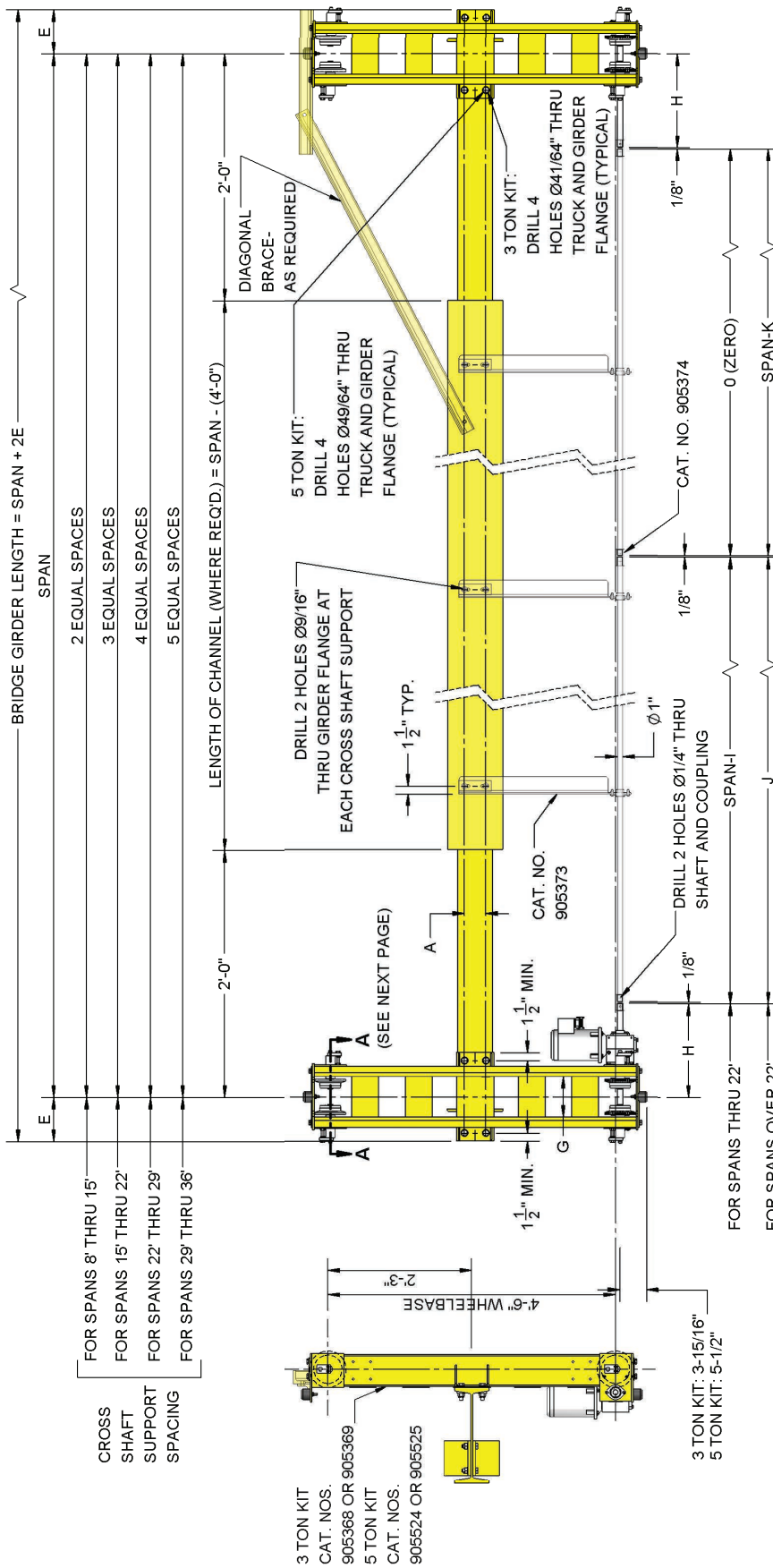
# CHAPTER 3

## ASSEMBLING BRIDGE GIRDER TO UNDERHUNG END TRUCKS

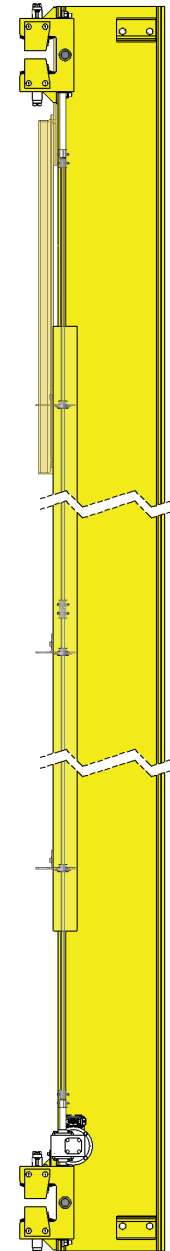


NOTE: CROSS SHAFT IS NOT REQUIRED IF DUAL ENDTRUCK MOTORS ARE PART OF YOUR CONFIGURATION

### 3.A) PLAN VIEW

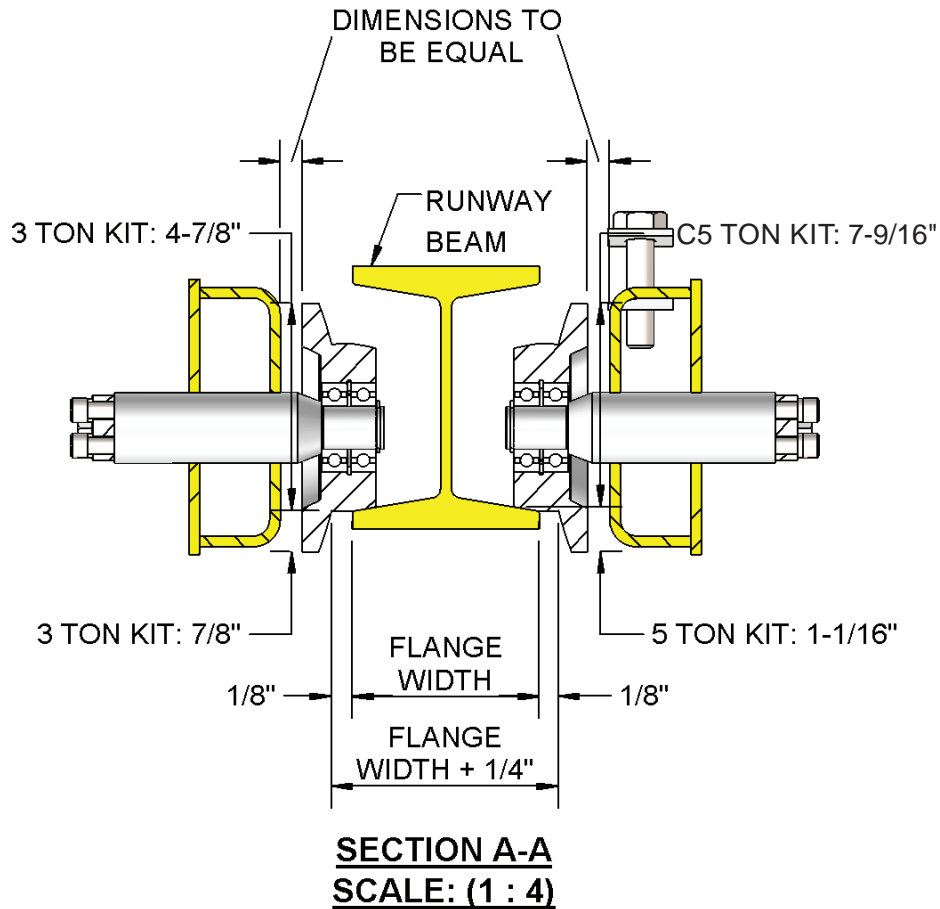


### 2.A PLAN VIEW

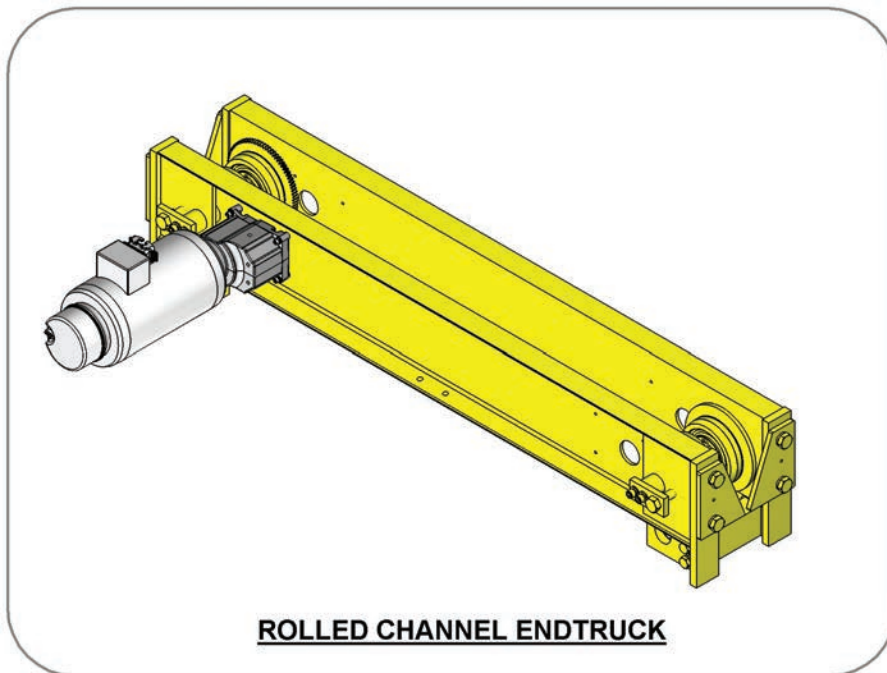
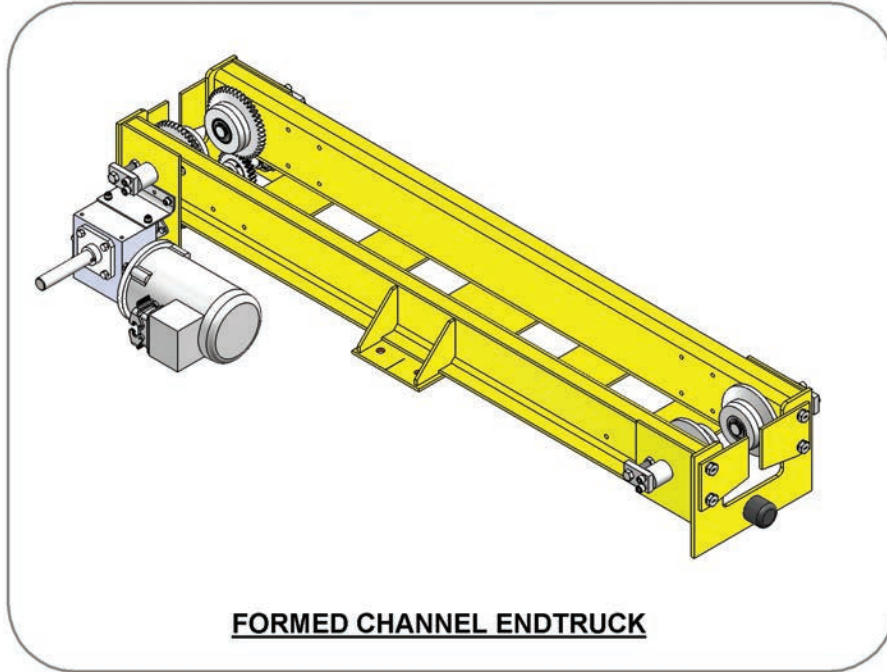


### 3.B) DIMENSION DETAILS FOR GIRDER LENGTH CALCULATION

TRUCKS CONFIGURATION NUMBERS	DISTANCE BETWEEN CENTER OF END TRUCK AND EXTREME END OF ITS TOW PLATE	INTERNAL SPACE BETWEEN END TRUCK CHANNELS	LENGTH OF DRIVE SHAFT FROM END TRUCK CENTER	LENGTH OF FIRST CROSS SHAFT		LENGTH OF SECOND CROSS SHAFT
	E	G	H	I	J	K
905368, 905369	8-1/4"	7-5/8"	1' - 2"	2' - 4-1/4"	14' - 9"	17' - 1-3/8"
905368W1, 905369W1	9-1/2"	10-1/8"	1' - 3-1/4"	2' - 6-3/4"	14' - 7-3/4"	17' - 2-5/8"
905368W2, 905369W2	10-3/4"	1' - 0-5/8"	1' - 4-1/2"	2' - 9-1/4"	14' - 6-1/2"	17' - 3-7/8"
905368PT, 905369PT	8-1/4"	7-5/8"	1' - 2"	2' - 4-1/4"	14' - 9"	17' - 1-3/8"
905368SR, 905369SR	8-1/4"	7-5/8"	1' - 2"	2' - 4-1/4"	14' - 9"	17' - 1-3/8"
905524, 905525	9-3/8"	8-7/8"	1' - 2-5/8"	2' - 5-1/2"	14' - 9"	17' - 2-5/8"
905524W1, 905525W1	10-11/16"	11-1/2"	1' - 3-15/16"	2' - 8-1/8"	14' - 7-3/4"	17' - 4"
905524W2, 905525W2	11-15/16"	1' - 2"	1' - 5-3/16"	2' - 10-5/8"	14' - 6-1/2"	17' - 5-1/4"
905524PT, 905525PT	9-3/8"	8-7/8"	1' - 2-5/8"	2' - 5-1/2"	14' - 9"	17' - 2-5/8"
905524SR, 905525SR	9-3/8"	8-7/8"	1' - 2-5/8"	2' - 5-1/2"	14' - 9"	17' - 2-5/8"



### 3.C) UNDERHUNG END TRUCK TYPES





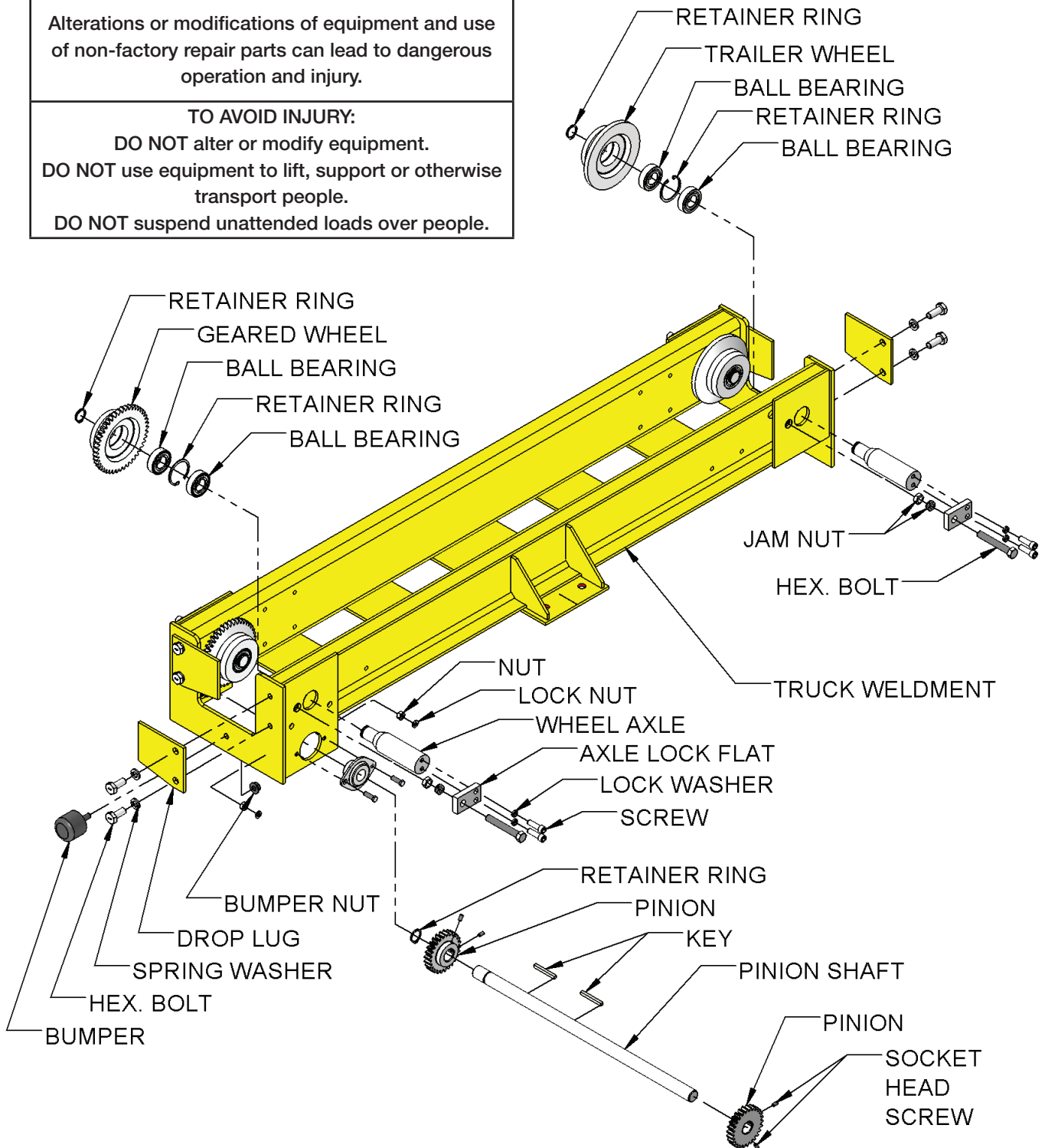
### 3.D) FORMED CHANNEL END TRUCK

#### **⚠ WARNING**

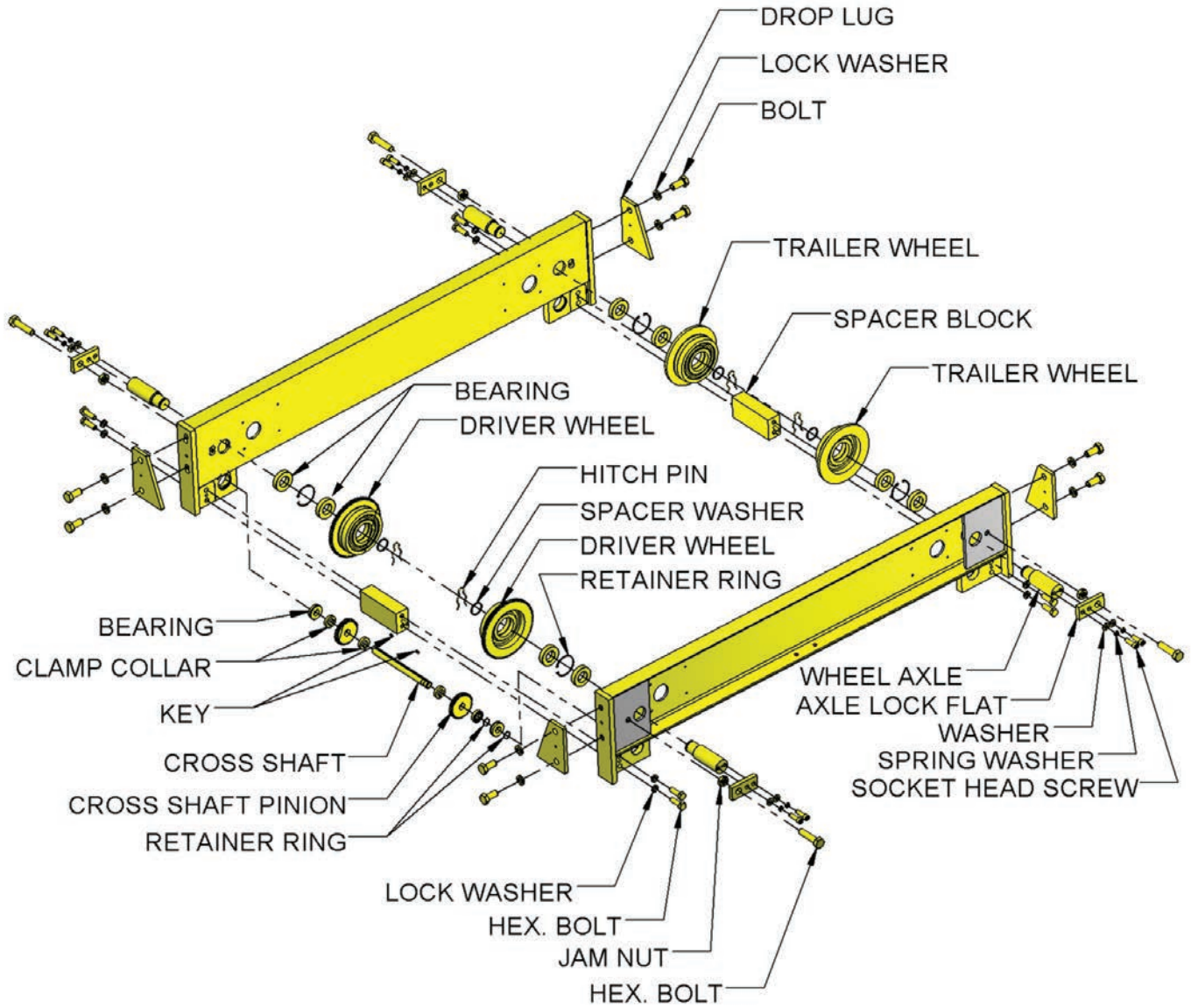
Alterations or modifications of equipment and use of non-factory repair parts can lead to dangerous operation and injury.

#### TO AVOID INJURY:

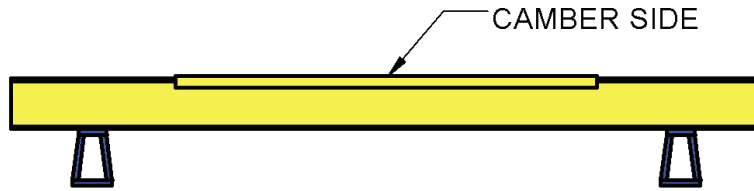
- DO NOT alter or modify equipment.
- DO NOT use equipment to lift, support or otherwise transport people.
- DO NOT suspend unattended loads over people.



### 3.E) ROLLED CHANNEL END TRUCK

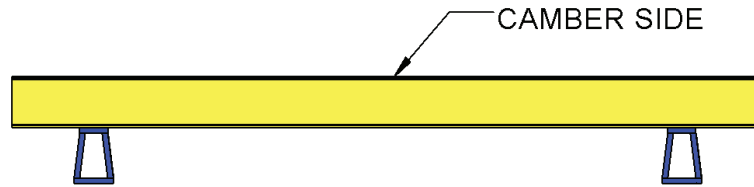


## STEP 1: BRIDGE GIRDER LENGTH (AS REQUIRED)



GIRDER BEAM WITH CAPPING CHANNEL

\* CHANNEL MUST BE A MINIMUM LENGTH OF THE SPAN MINUS 4'-0"

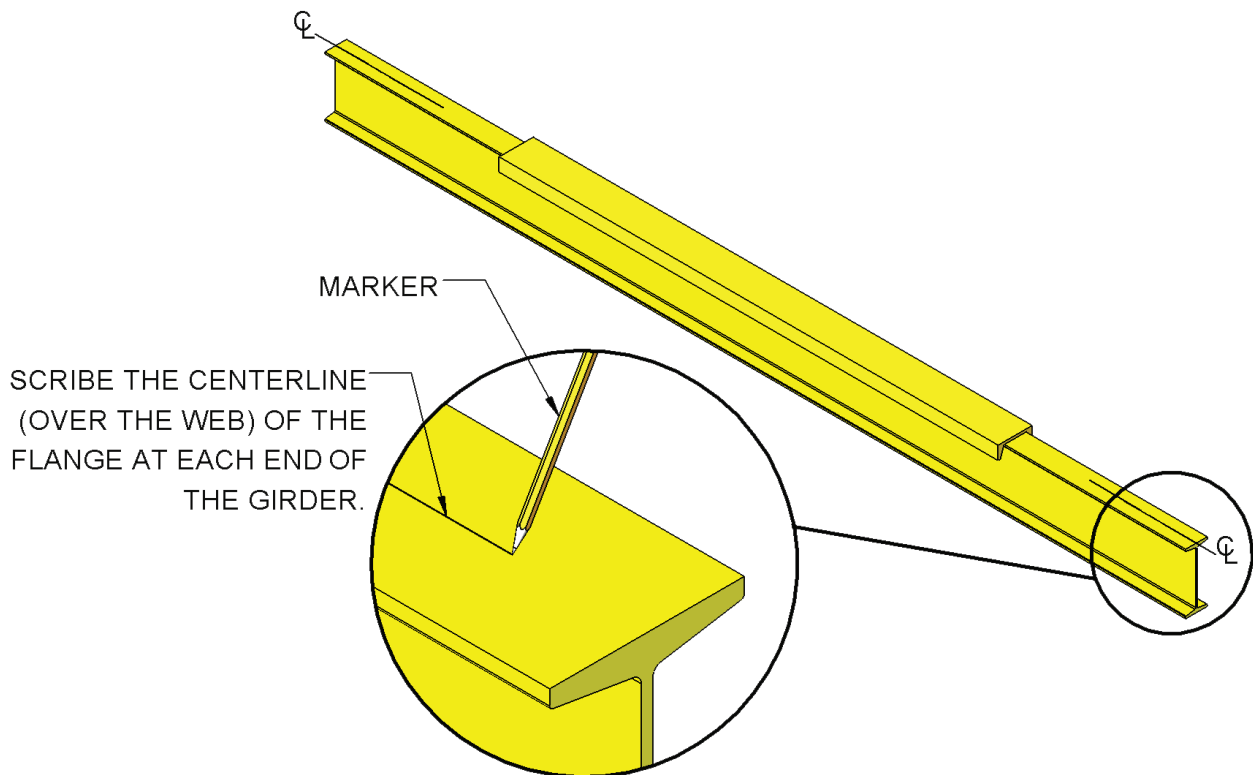


GIRDER BEAM WITHOUT CAPPING CHANNEL

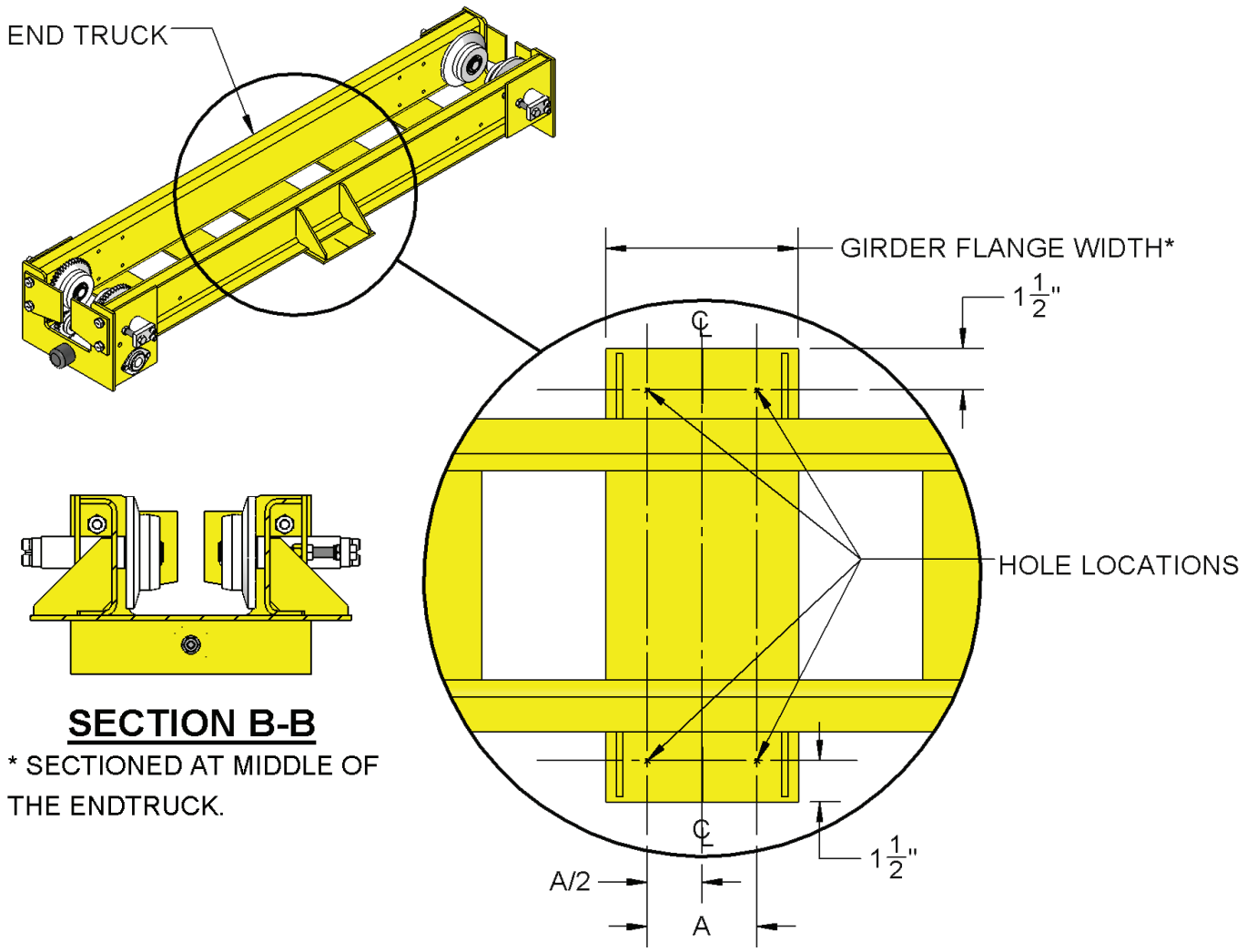
\* GIRDER LENGTH TO BE DETERMINED BY SPAN LENGTH

RATED LOAD (Tons)	MINIMUM LENGTH OF BEAMS REQUIRED
3 Ton KIT	SPAN + (1' - 4-1/2")
5 Ton KIT	SPAN + (1' - 6-3/4")

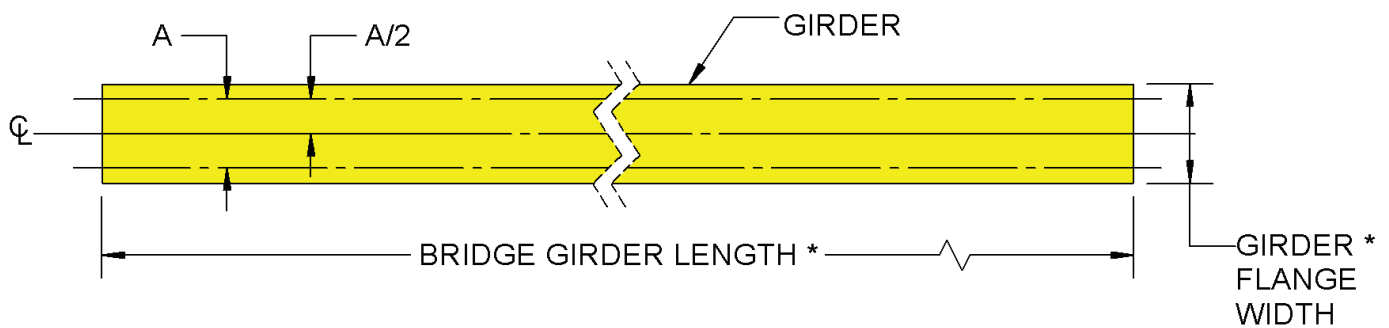
## STEP 2: MARKING CENTERLINE ON THE GIRDER (AS REQUIRED)



# STEP 3: MARKING CENTERLINES AND HOLE LOCATIONS ON END TRUCK – UHFC



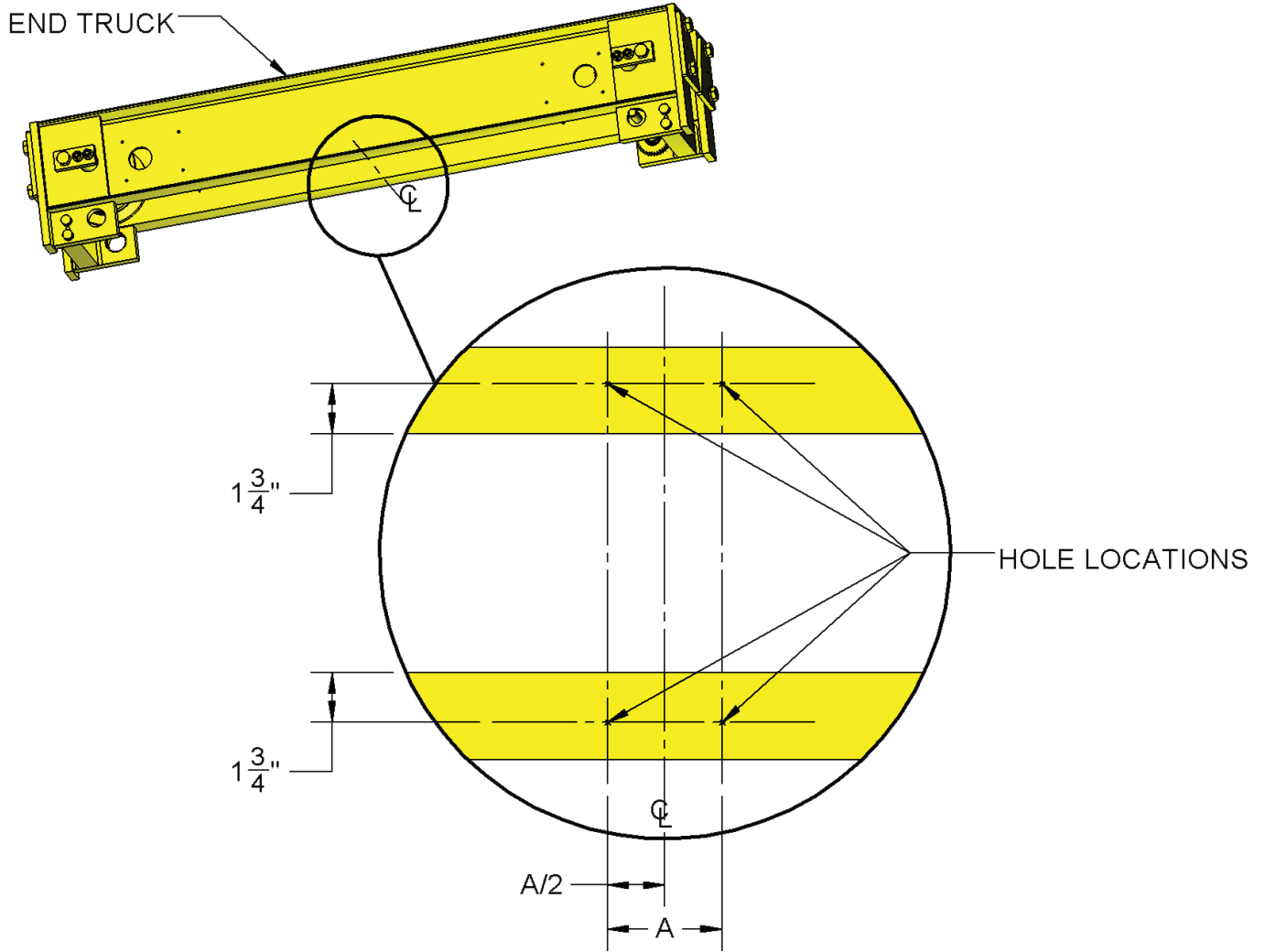
## MARKING HOLE LOCATION CENTERLINES ON THE GIRDER



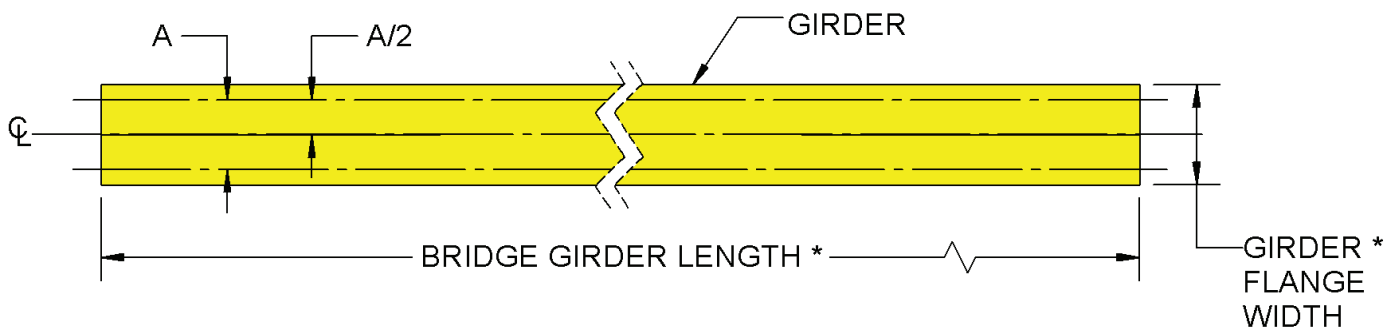
BRIDGE GIRDER FLANGE WIDTH	A
3-3/8"	2"
3-5/8" THRU 4"	2-1/4"
4-5/8" THRU 5-1/4"	2-3/4"
5-1/2" THRU 6-3/4"	3-1/2"
7" THRU 7-5/8"	4"

\* REFER TO PLAN VIEW (PAGE 14) FOR DIMENSIONAL CALCULATIONS FOR GIRDER.

# STEP 3A: MARKING CENTERLINES AND HOLE LOCATIONS ON END TRUCK – UHRC



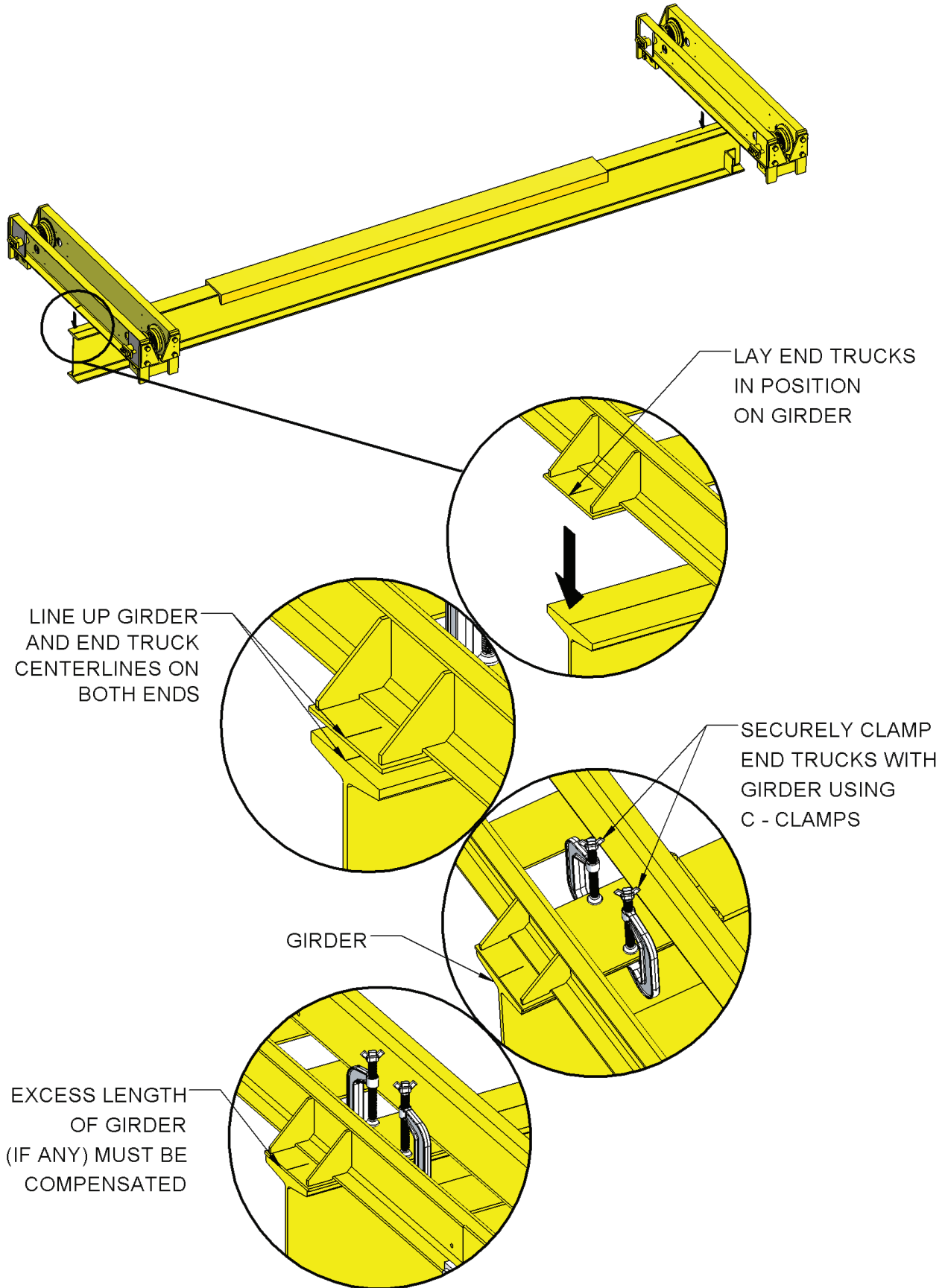
## MARKING HOLE LOCATION CENTERLINES ON THE GIRDER



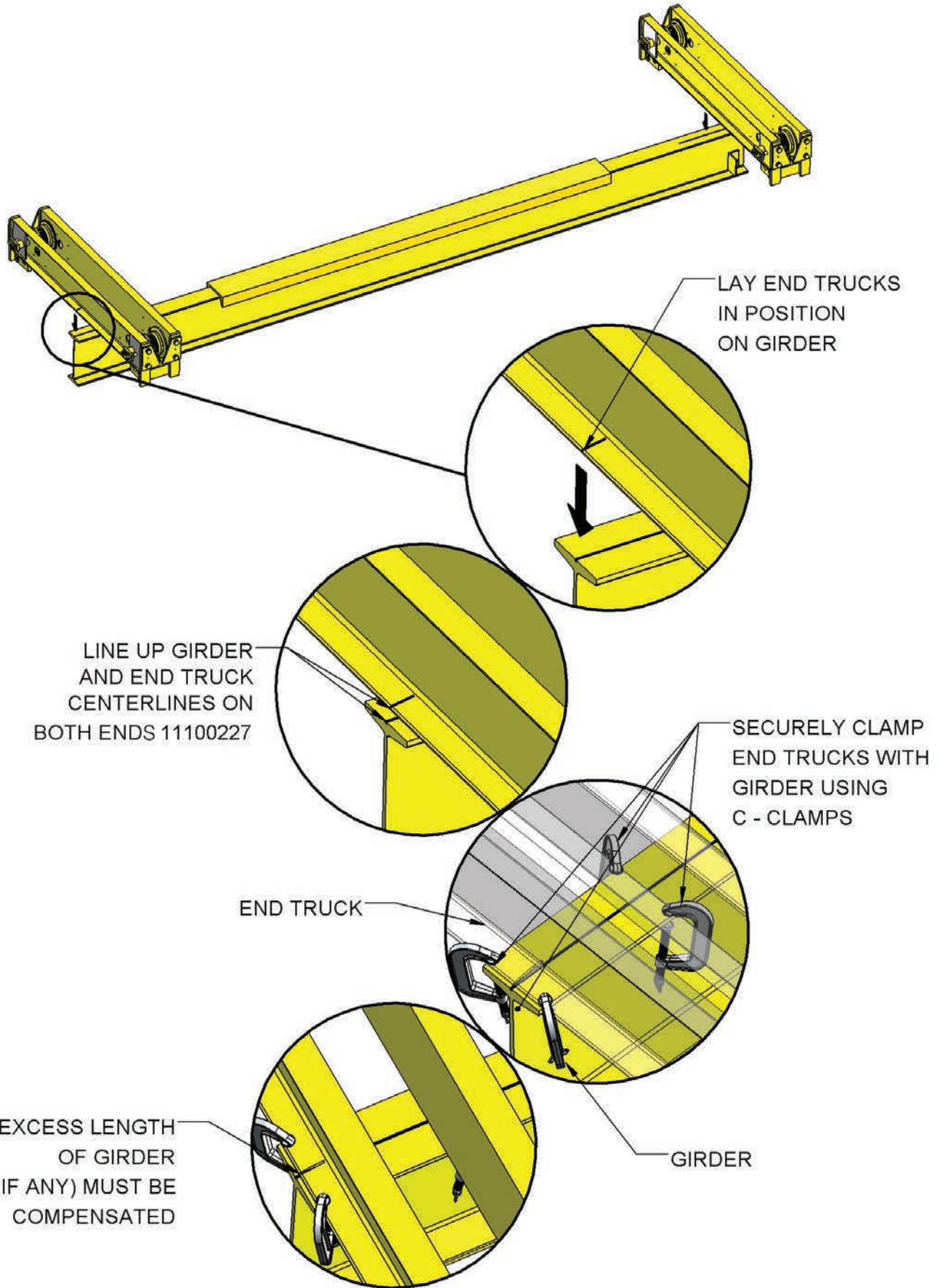
BRIDGE GIRDER FLANGE WIDTH	A
3-3/8"	2"
3-5/8" THRU 4"	2-1/4"
4-5/8" THRU 5-1/4"	2-3/4"
5-1/2" THRU 6-3/4"	3-1/2"
7" THRU 7-5/8"	4"

\* REFER TO PLAN VIEW (PAGE 14) FOR DIMENSIONAL CALCULATIONS FOR GIRDER.

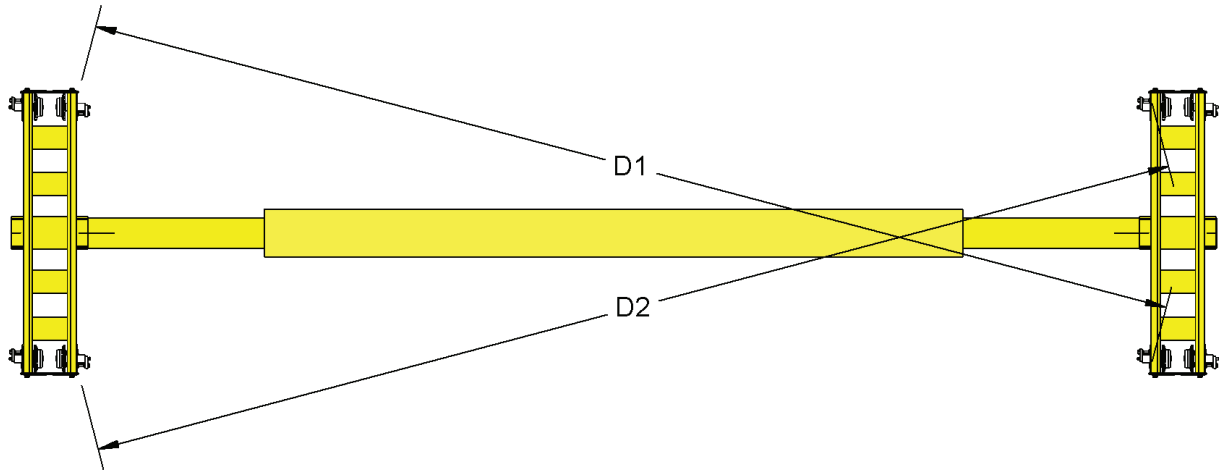
# STEP 4: LOCATE & ALIGN END TRUCKS – UHFC



# STEP 4A: LOCATE & ALIGN END TRUCKS – UHRC



## STEP 5: CHECK SQUARENESS BETWEEN END TRUCKS



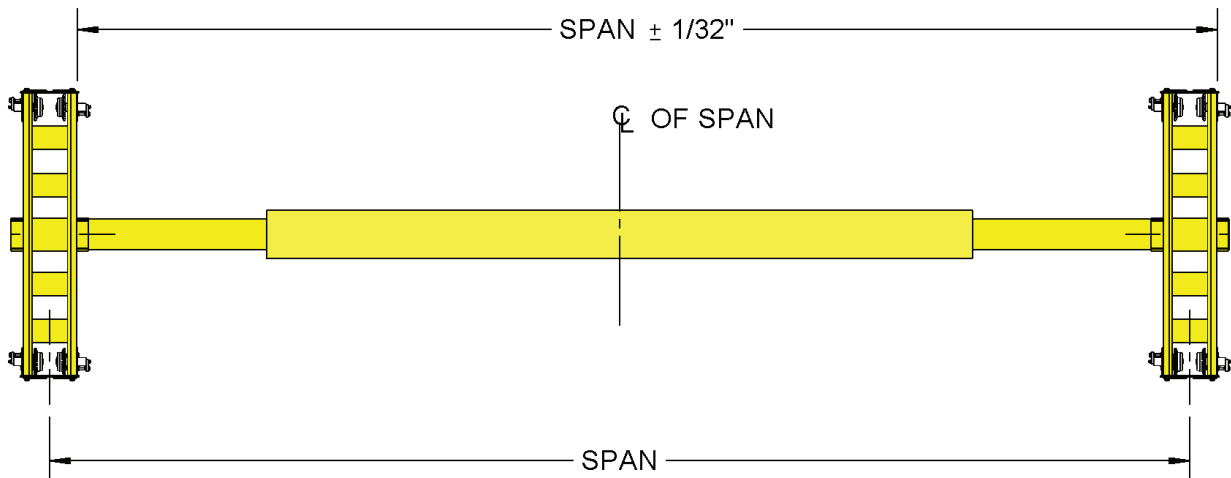
FOR SQUARENESS BETWEEN END TRUCKS:  $(D1 - D2) \leq 1/32"$

### **NOTICE**

*The crane builder and user are responsible for marking the crane and also for checking for compliance with all local, state and national codes.*

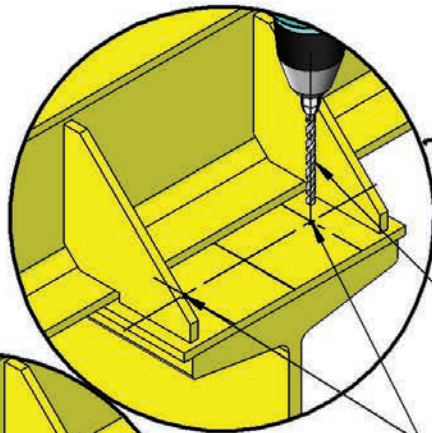
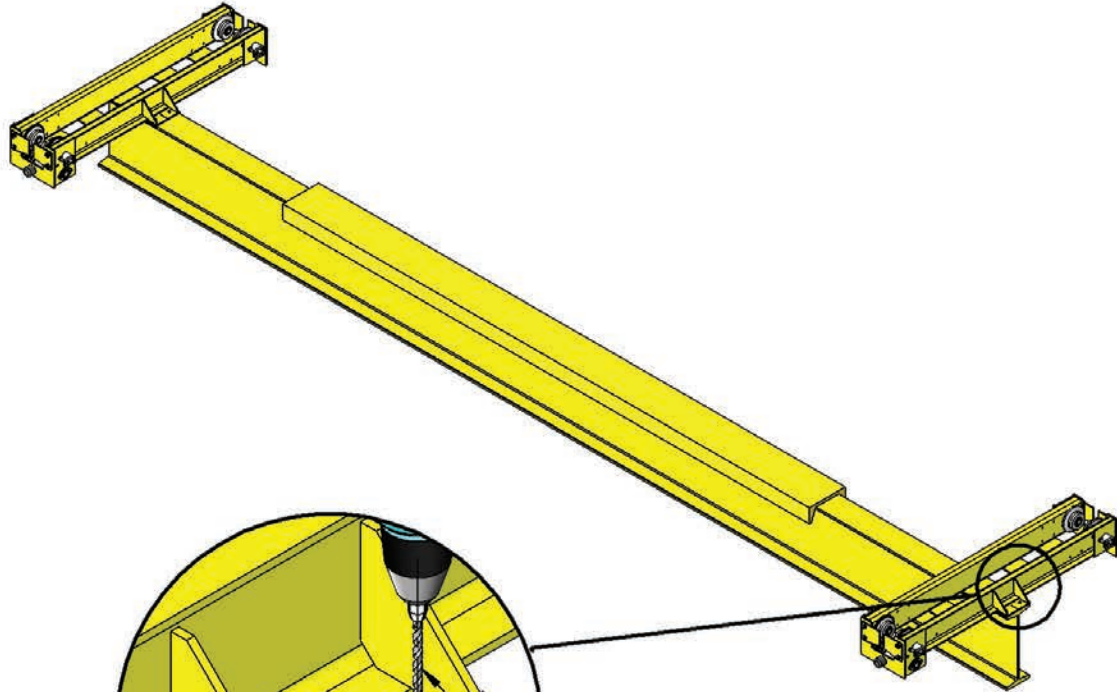
D1 & D2 - DIAGONAL MEASUREMENTS

## STEP 6: CHECK SPAN (CENTER TO CENTER) OF END TRUCKS



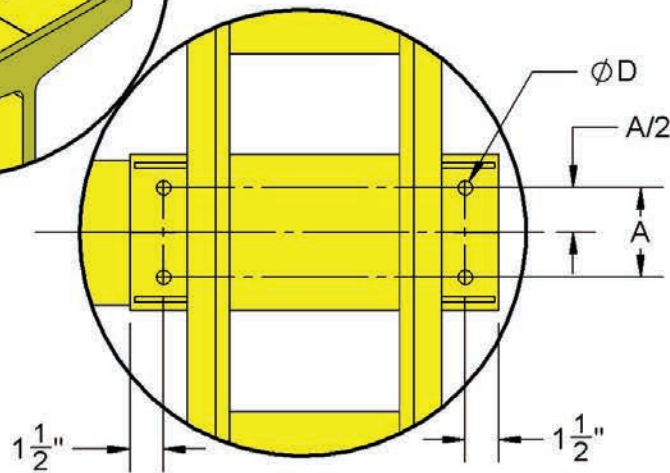
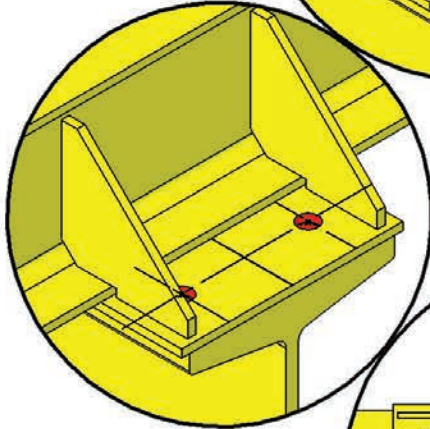


# STEP 7: DRILLING HOLES ON END TRUCKS AND GIRDER FLANGE – UHFC



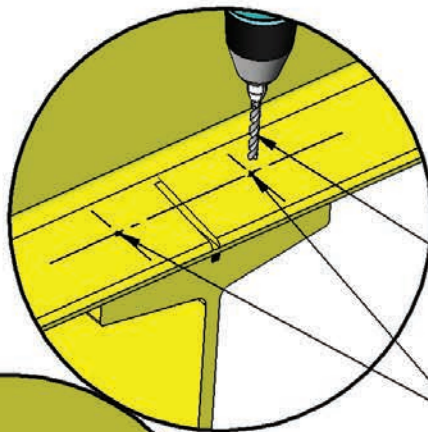
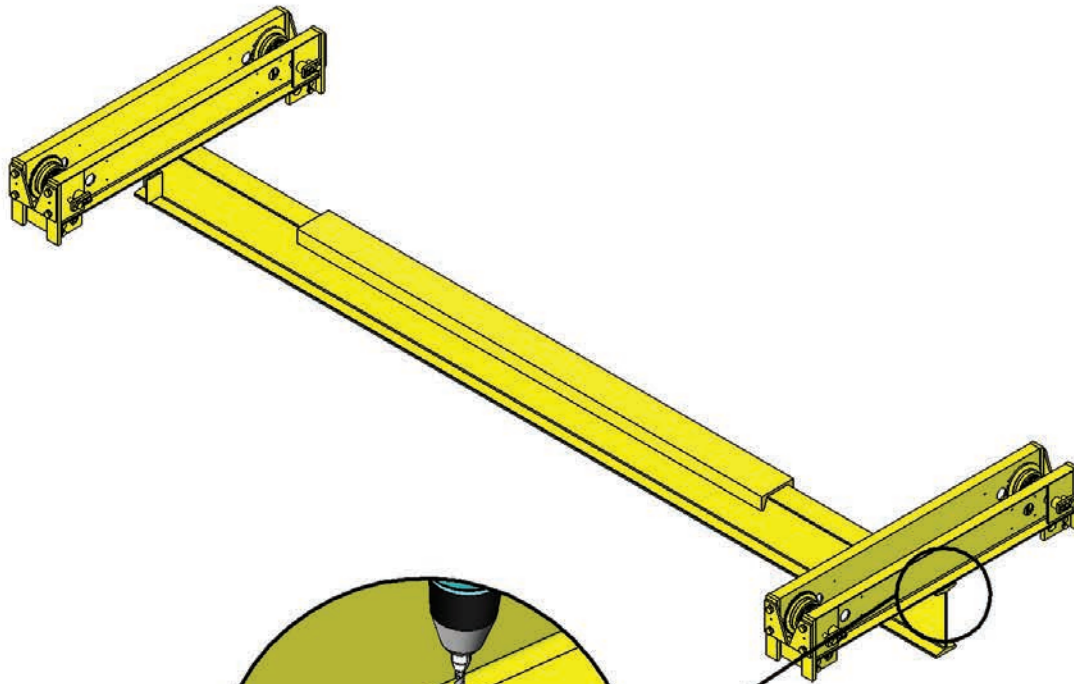
DRILL 4 HOLES THROUGH END TRUCK AND GIRDER FLANGE AT BOTH ENDS

HOLE LOCATIONS



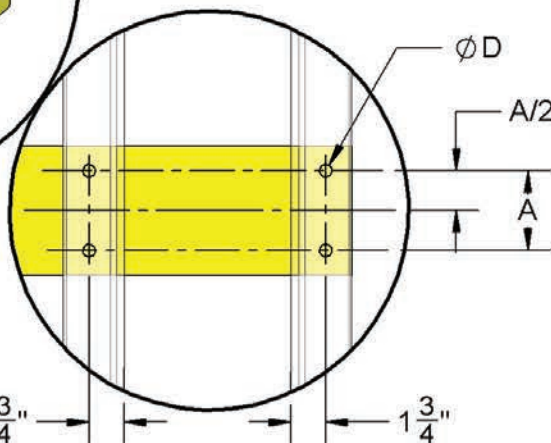
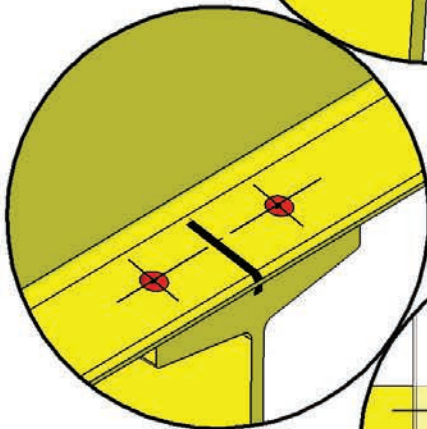
RATED LOAD (TONS)	HOLE DIAMETER "ØD"	BOLT DIAMETER
3 TON KIT	41/64"	5/8"
5 TON KIT	49/64"	3/4"

# STEP 7A: DRILLING HOLES ON END TRUCKS AND GIRDER FLANGE – UHRC



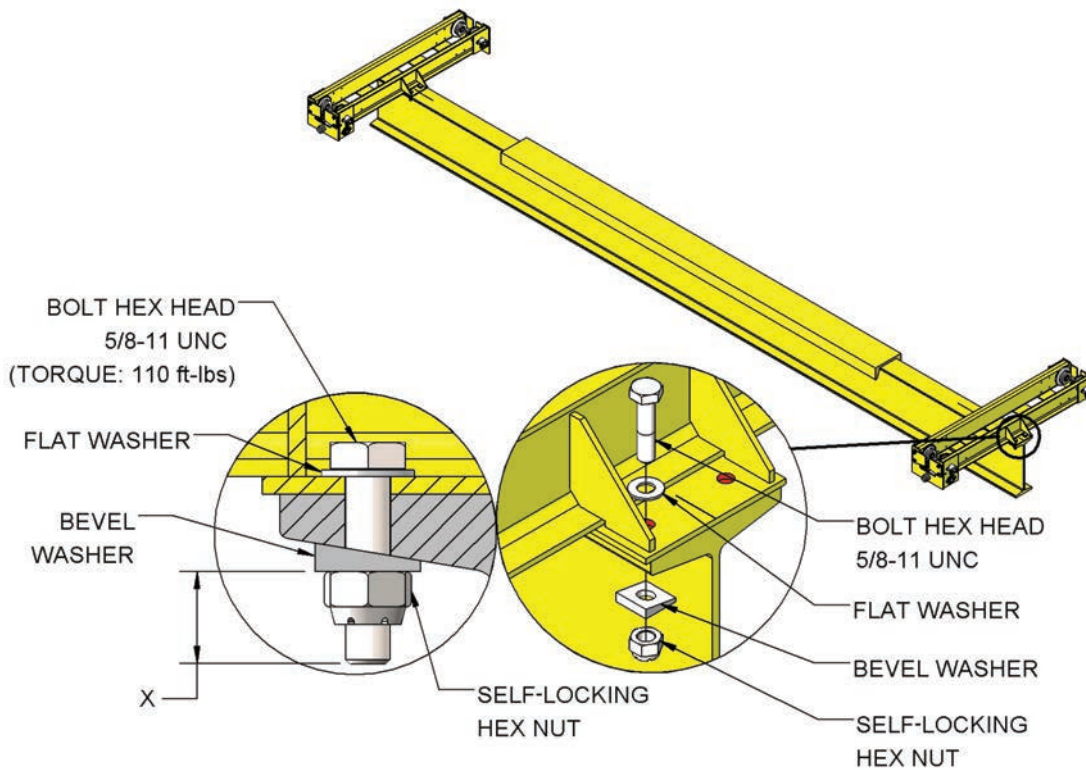
DRILL 4 HOLES THROUGH END TRUCK AND GIRDER FLANGE AT BOTH ENDS

HOLE LOCATIONS



RATED LOAD (TONS)	HOLE DIAMETER "ØD"	BOLT DIAMETER
3 TON KIT	41/64"	5/8"
5 TON KIT	49/64"	3/4"

## STEP 8: ASSEMBLE GIRDER TO END TRUCKS – UHFC

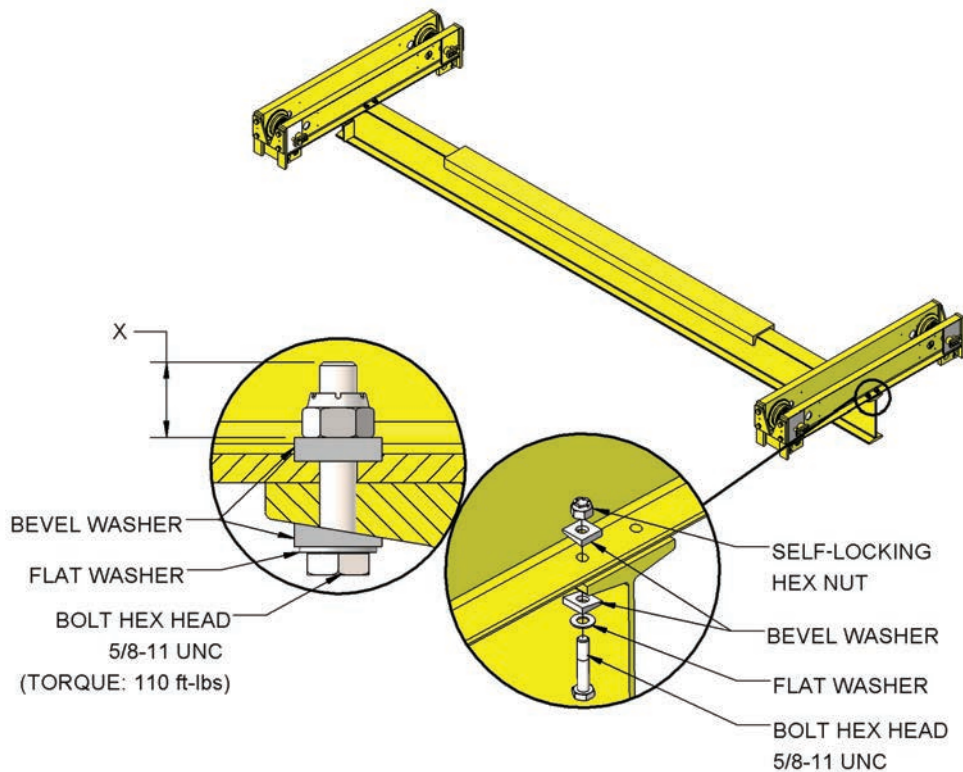


- IF “X” DISTANCE IS LESS THAN 1”, REMOVE FLAT WASHER UNDER THE BOLT HEAD.
  - IF “X” DISTANCE IS GREATER THAN 1-1/4”, ADD A SECOND FLAT WASHER UNDER THE BOLT HEAD.
- ✓ TIGHTEN ALL BOLTS AND NUTS PROVIDED IN KIT USING THE TURN-OF-NUT METHOD. THIS IS DONE BY ALTERNATELY BRINGING BOLTS AND NUTS TO A “SNUG-TIGHT” CONDITION TO ENSURE THAT MATING SURFACES ARE BROUGHT INTO FULL CONTACT WITH EACH OTHER. THEN, MAKE A FINAL 1/2 TURN ON ALL BOLTS AND NUTS.

### **⚠ CAUTION**

DO NOT SUBSTITUTE STANDARD BOLTS AND NUTS FOR THE SPECIAL TRUCK CONNECTING BOLTS AND NUTS FURNISHED WITH KIT. ONLY HIGH-STRENGTH BOLTS (S.A.E., GRADE 5) AND ELASTIC COLLARARED SELF-LOCKING NUTS, AS FURNISHED, ARE ACCEPTABLE FOR ATTACHING TRUCK FRAMES TO BRIDGE BEAM. HIGH STRENGTH BOLTS ARE IDENTIFIED ON THE TOP OF THE HEAD BY THREE RADIAL LINES, EQUALLY SPACED AT 120 DEGREES. SELF LOCKING NUTS MUST HAVE TWO THREADS, MINIMUM EXTENDING THROUGH NUT. IF NECESSARY, DISCARD FLAT WASHER TO GET TWO THREADS.

## STEP 8A: ASSEMBLE GIRDER TO END TRUCKS – UHRC

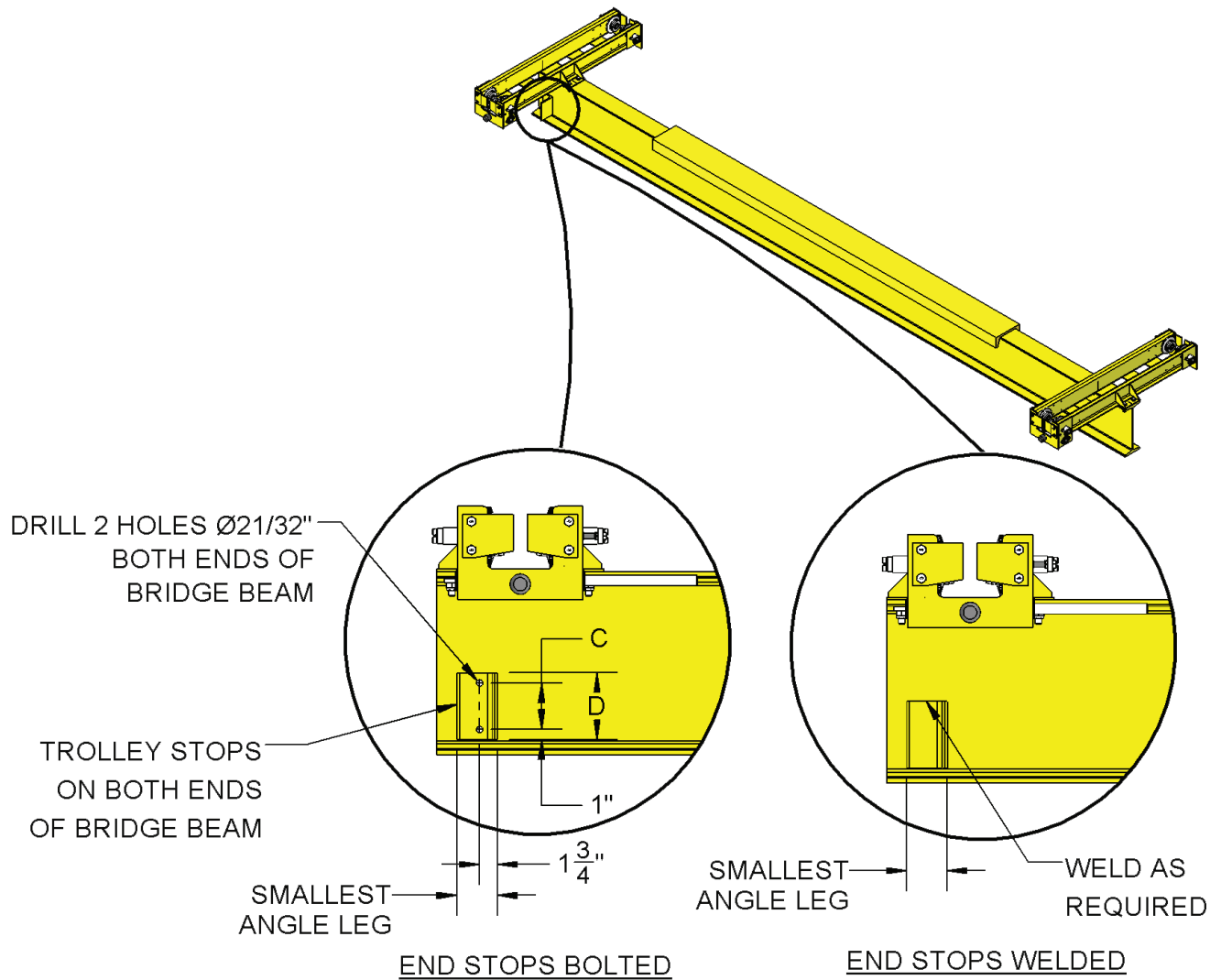


- IF “X” DISTANCE IS LESS THAN 1”, REMOVE FLAT WASHER UNDER THE BOLT HEAD.
  - IF “X” DISTANCE IS GREATER THAN 1-1/4”, ADD A SECOND FLAT WASHER UNDER THE BOLT HEAD.
- ✓ TIGHTEN ALL BOLTS AND NUTS PROVIDED IN KIT USING THE TURN-OF-NUT METHOD. THIS IS DONE BY ALTERNATELY BRINGING BOLTS AND NUTS TO A “SNUG-TIGHT” CONDITION TO ENSURE THAT MATING SURFACES ARE BROUGHT INTO FULL CONTACT WITH EACH OTHER. THEN, MAKE A FINAL 1/2 TURN ON ALL BOLTS AND NUTS.

### **⚠ CAUTION**

DO NOT SUBSTITUTE STANDARD BOLTS AND NUTS FOR THE SPECIAL TRUCK CONNECTING BOLTS AND NUTS FURNISHED WITH KIT. ONLY HIGH-STRENGTH BOLTS (S.A.E., GRADE 5) AND ELASTIC COLLARATED SELF-LOCKING NUTS, AS FURNISHED, ARE ACCEPTABLE FOR ATTACHING TRUCK FRAMES TO BRIDGE BEAM. HIGH STRENGTH BOLTS ARE IDENTIFIED ON THE TOP OF THE HEAD BY THREE RADIAL LINES, EQUALLY SPACED AT 120 DEGREES. SELF LOCKING NUTS MUST HAVE TWO THREADS, MINIMUM EXTENDING THROUGH NUT. IF NECESSARY, DISCARD FLAT WASHER TO GET TWO THREADS.

# STEP 9: END STOP INSTALLATION



BRIDGE BEAM FLANGE WIDTH	A	TROLLEY STOP ANGLE SIZE* (4 REQ'D.)	B	C	D
3-3/8"	2"	3 x 3 x 3/8	1"	2"	4"
3-5/8" THRU 4"	2-1/4"	3-1/2 x 3 x 3/8	1"	3"	5"
4-5/8" THRU 5-1/4"	2-3/4"	4 x 3 x 3/8	1-1/2"	3"	5"
5-1/2" THRU 6-3/4"	3-1/2"	5 x 3 x 3/8	1-3/4"	3"	5"
7" THRU 7-5/8"	4"	6 x 3 x 3/8	1-3/4"	4"	6"

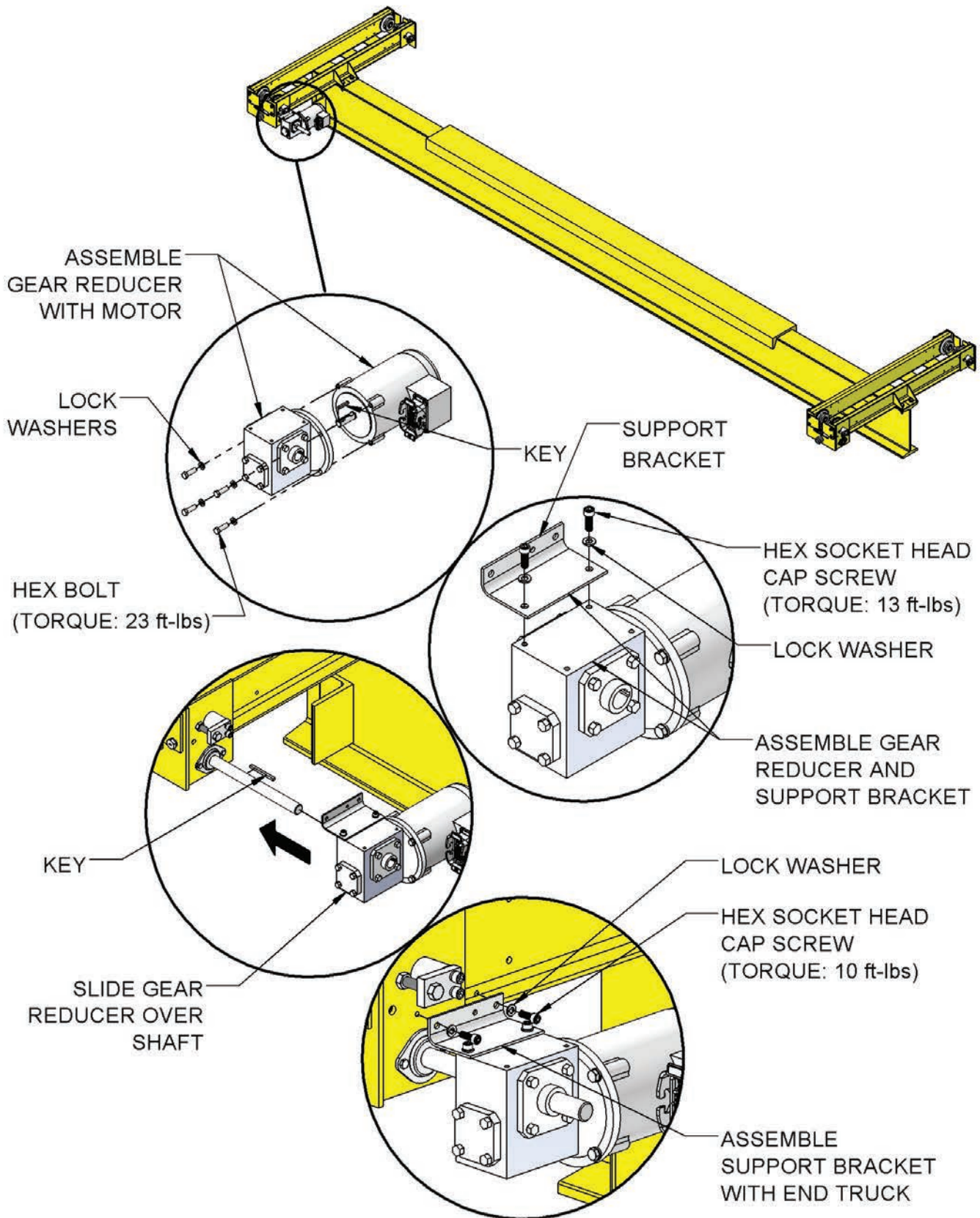
## **⚠ WARNING**

IMPROPERLY INSTALLED TROLLEY STOPS (CLIPS ANGLES) CAN RESULT IN LOSS OF BRIDGE WITH RESULTANT INJURY AND DAMAGE.

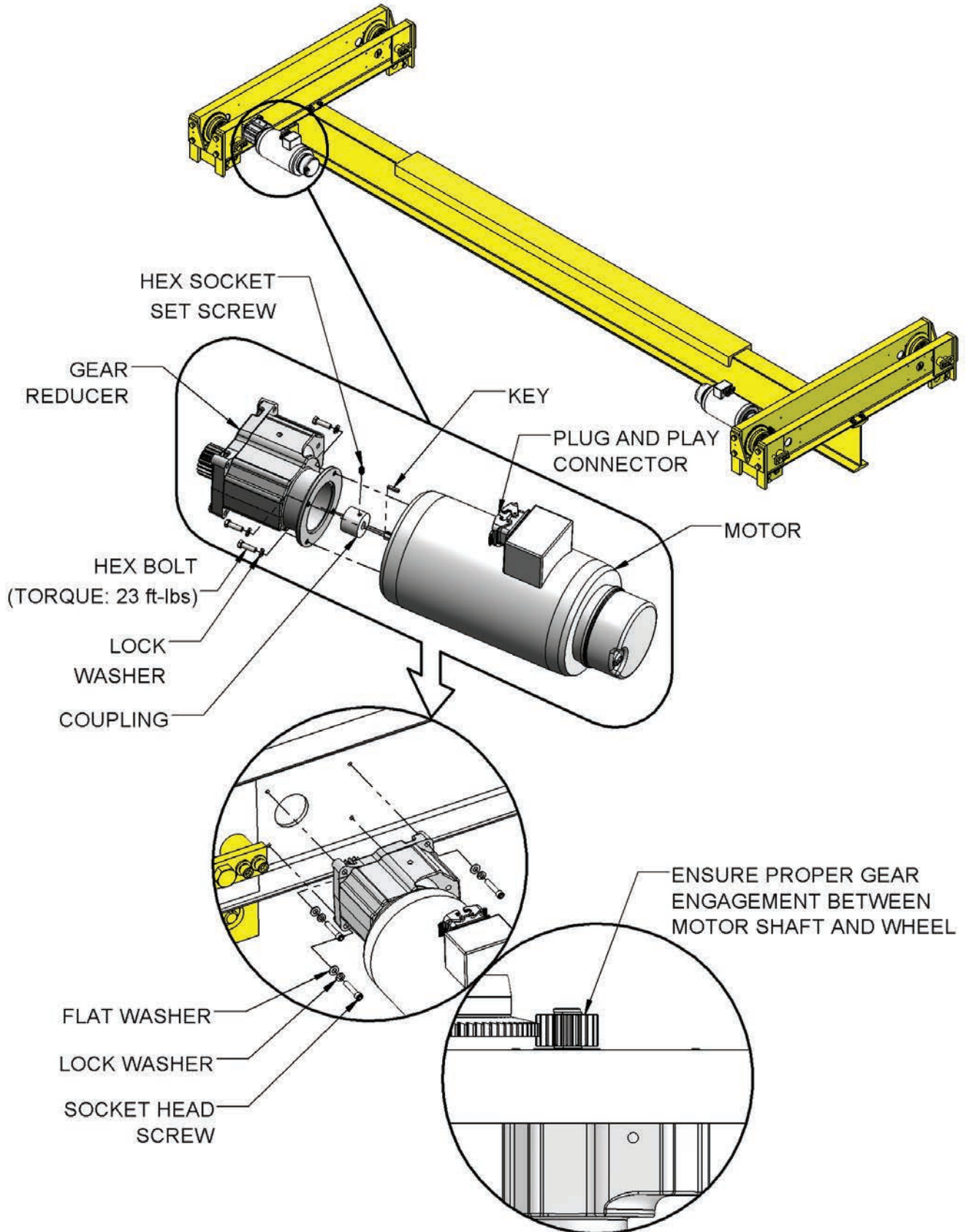
### TO AVOID INJURY AND DAMAGE:

INSTALL END STOPS ON BOTH ENDS OF BEAMS TO PREVENT HOIST TROLLEY FROM RUNNING OFF END OF BEAM.

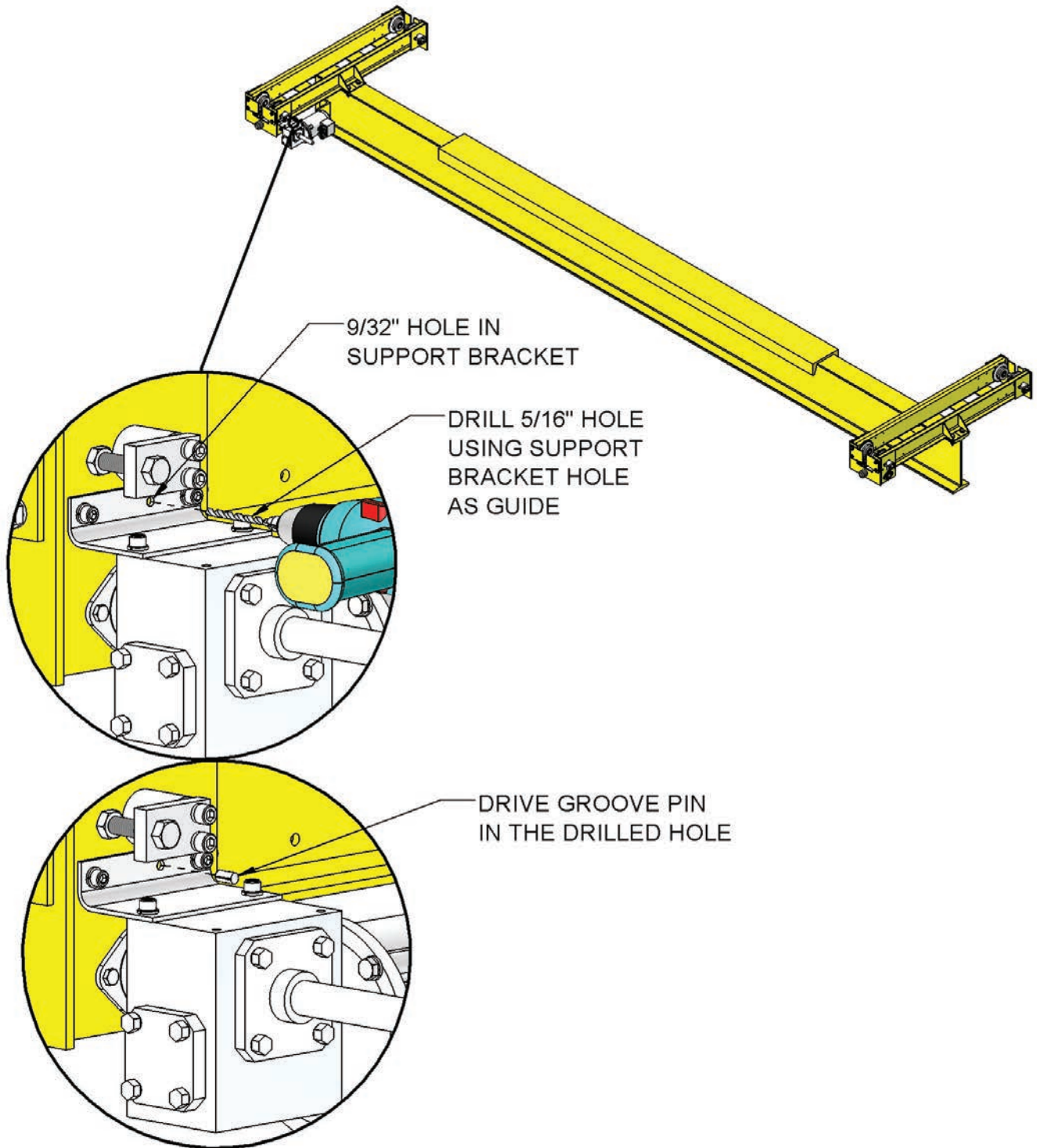
# STEP 10: ASSEMBLING MOTOR AND GEAR REDUCER WITH END TRUCK



# STEP 10A: UHRC END TRUCK A4 DRIVE INSTALLATION



## STEP 11: ASSEMBLING GROOVE PIN WITH END TRUCK AND SUPPORT BRACKET

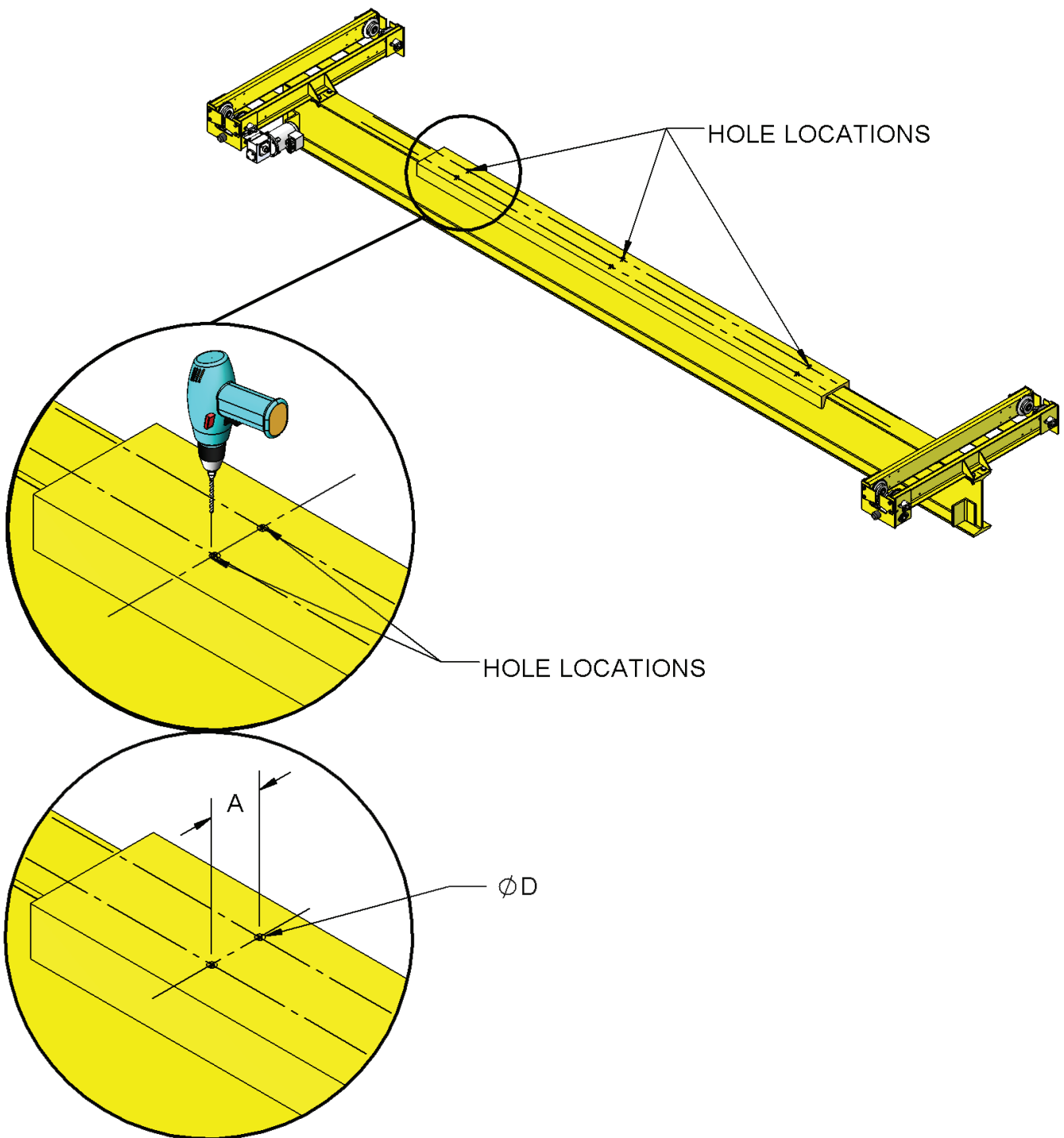


IT IS ALLOWABLE TO USE A DRIVE ON EACH TRUCK AND ELIMINATE THE CROSS SHAFT. IN THIS CASE, THE UPCOMING STEPS 12, 13, 14 & 15 ARE NOT REQUIRED.



# STEP 12: LOCATE AND DRILL HOLES FOR CROSS ARM SUPPORT

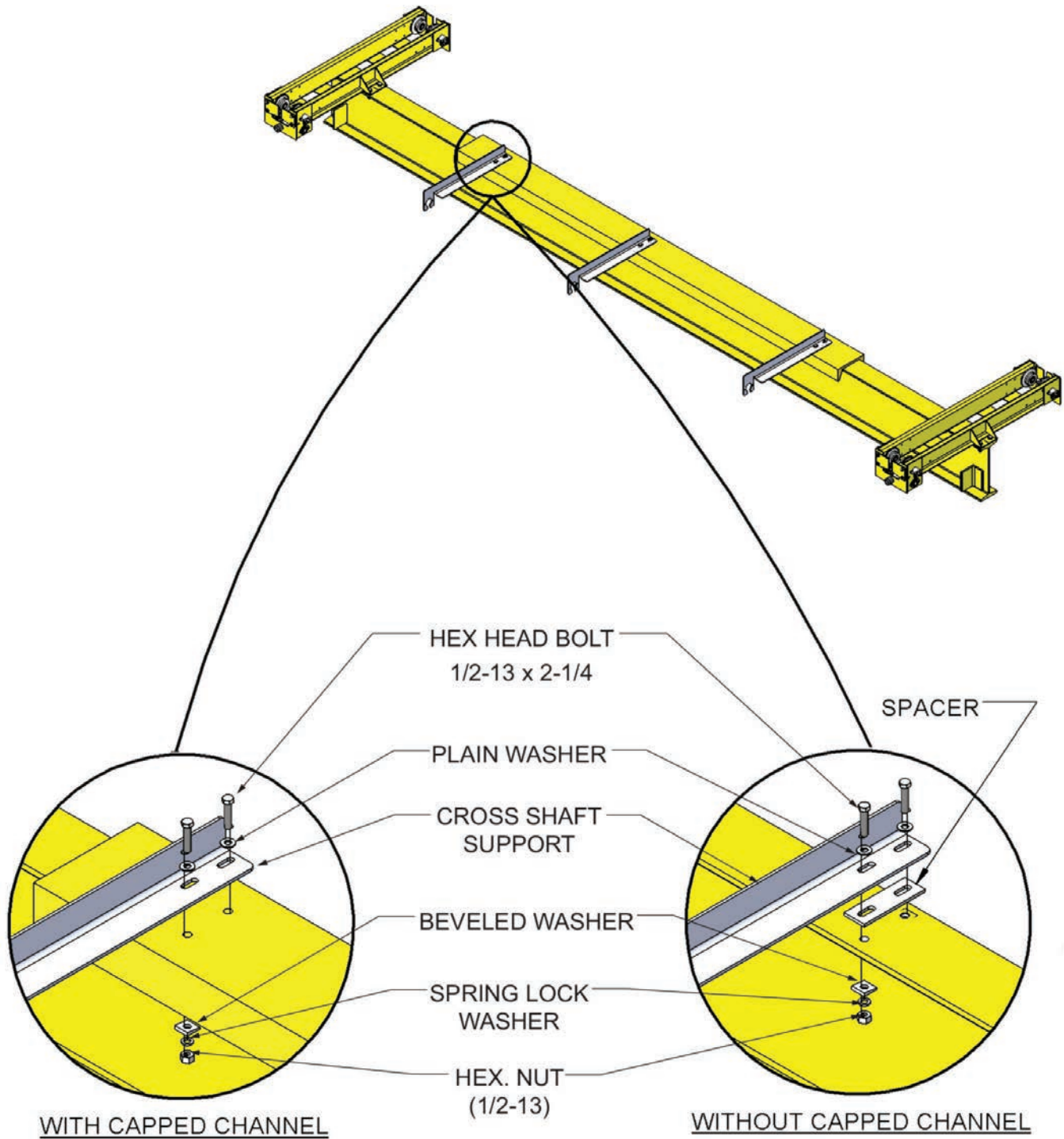
CROSS ARM SUPPORTS NOT REQUIRED IF YOUR CONFIGURATION INCLUDES DUAL ENDTRUCK MOTORS. YOU MAY SKIP TO PAGE 37.



\* REFER TO PLAN VIEW (PAGE 14) FOR NUMBER OF CROSS ARMS AND ITS POSITION DIMENSION DETAILS.

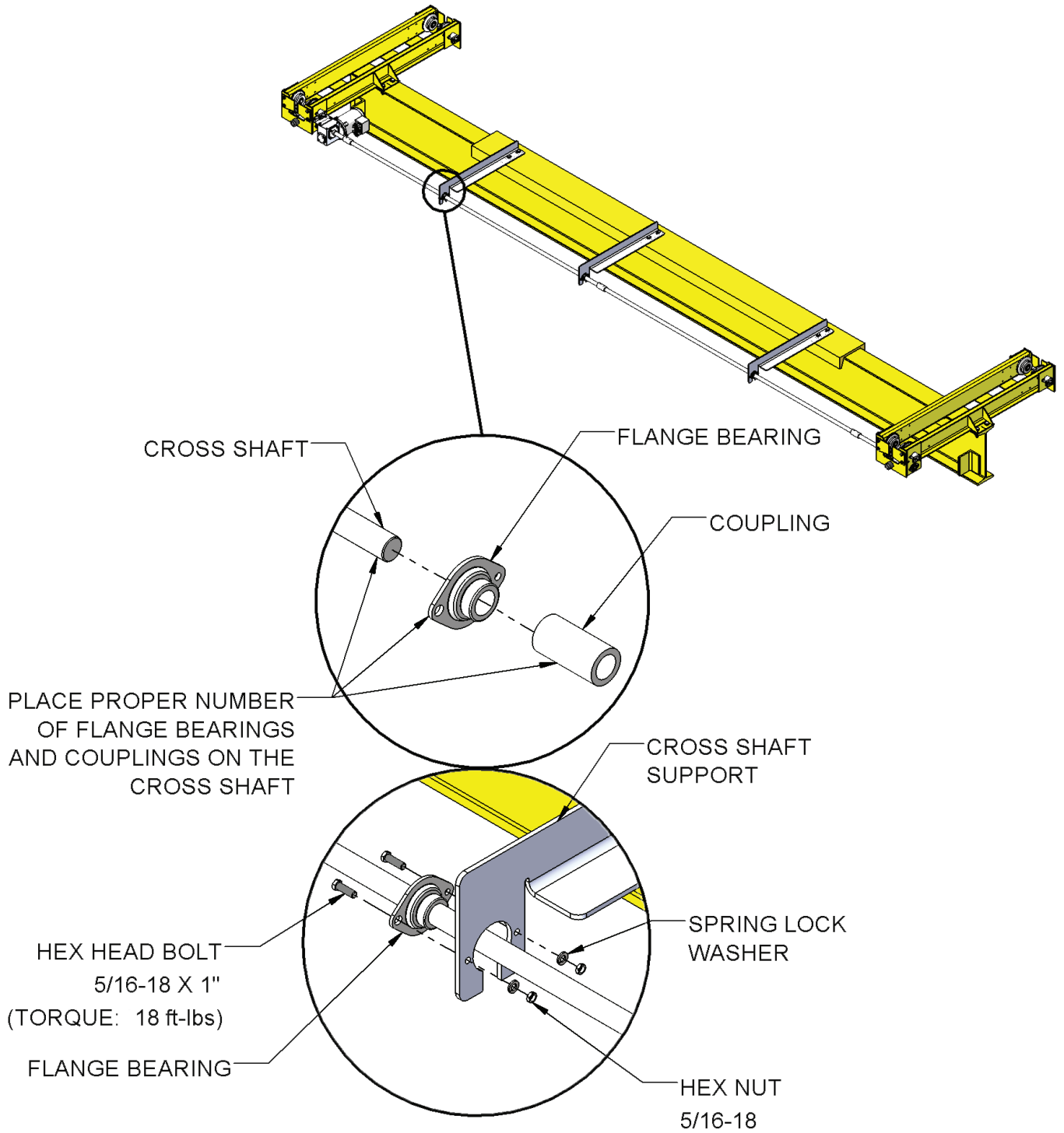
RATED LOAD (TONS)	HOLE DIAMETER "ØD"	BOLT DIAMETER
3 TON KIT	41/64"	5/8"
5 TON KIT	49/64"	3/4"

# STEP 13: MOUNTING CROSS SHAFT SUPPORT

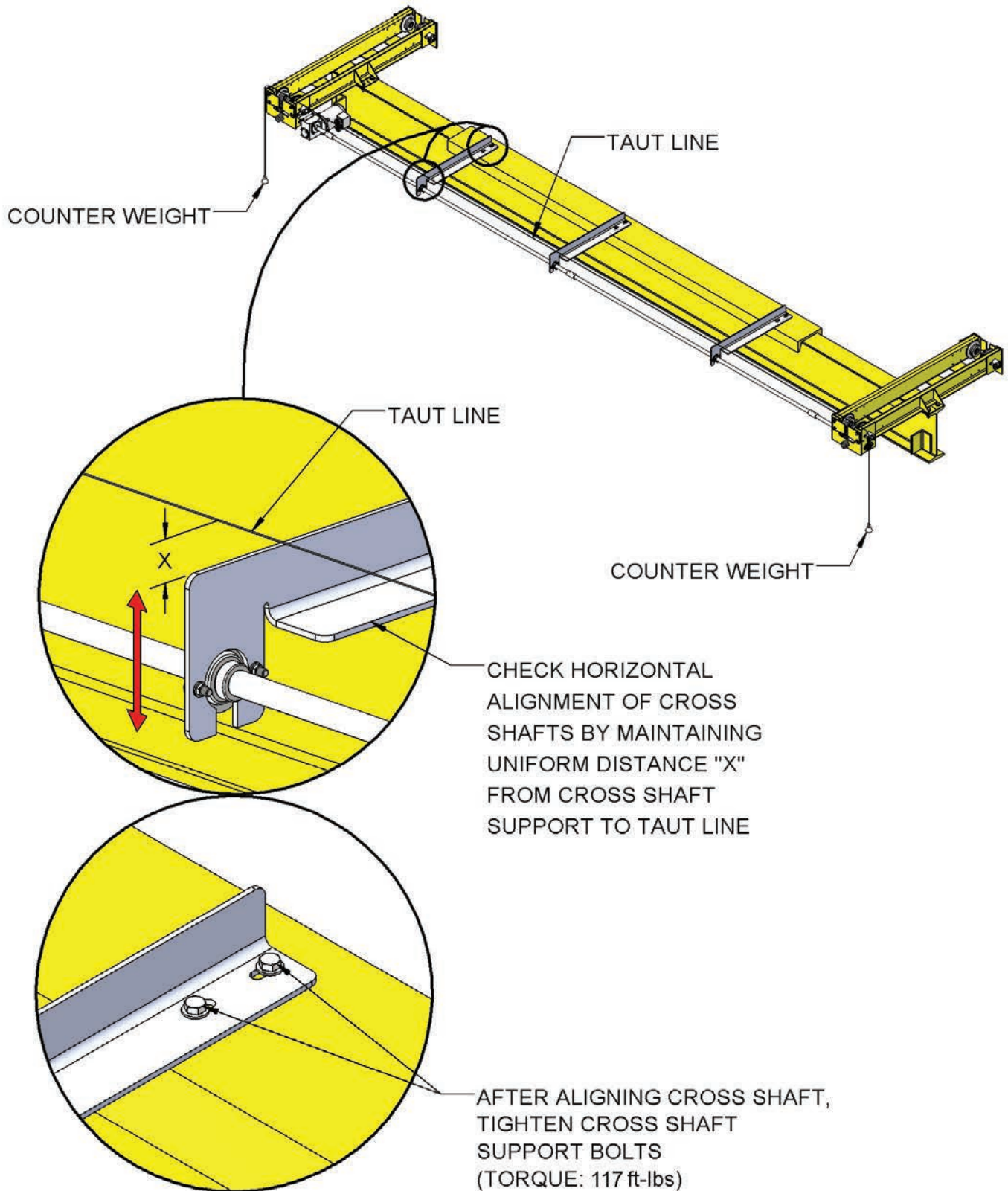


\* LOOSELY BOLT THE CROSS SHAFT SUPPORTS TO THE BRIDGE BEAM.

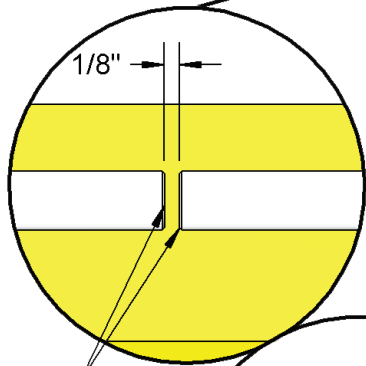
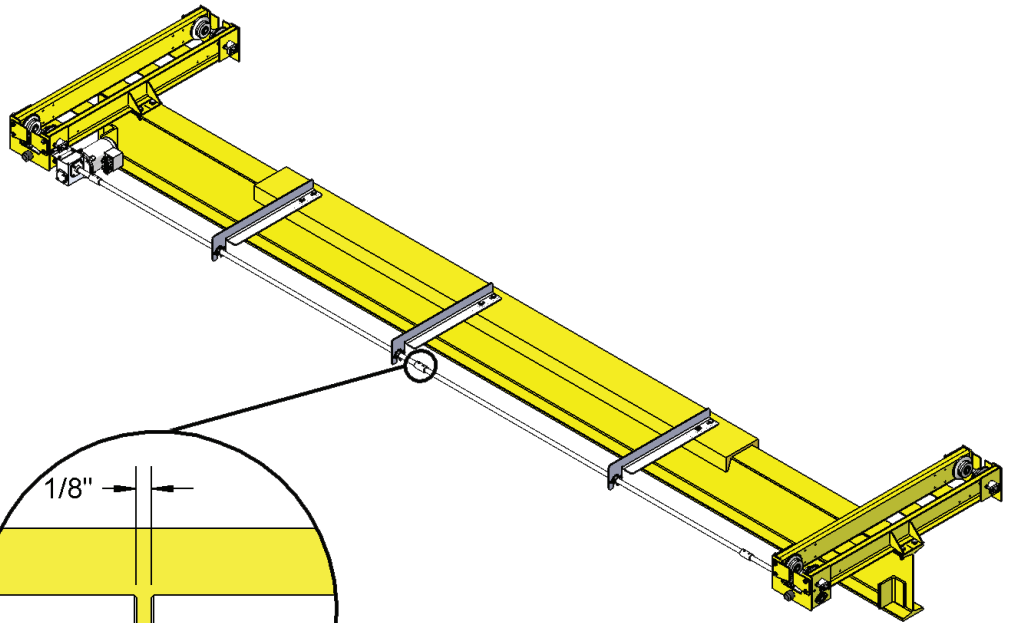
# STEP 14: MOUNTING CROSS SHAFT, BEARING AND COUPLING ON CROSS SHAFT SUPPORT



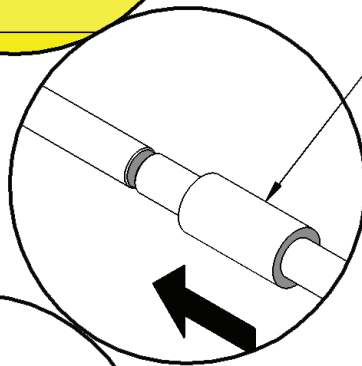
# STEP 15: CHECKING HORIZONTAL ALIGNMENT OF THE CROSS SHAFT



# STEP 16: ASSEMBLING COUPLING WITH CROSS SHAFT

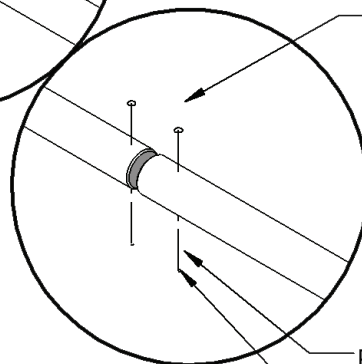
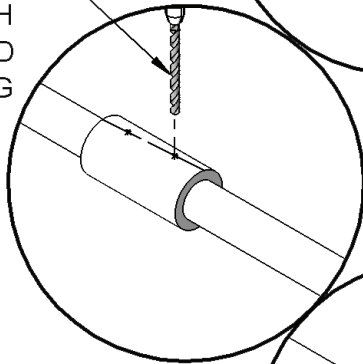


CHECK THE SPACE BETWEEN THE CROSS SHAFTS



POSITION THE COUPLING

DRILL  $\varnothing 1/4"$  HOLES THROUGH CROSS SHAFT AND COUPLING



SOCKET HEAD CAP SCREW

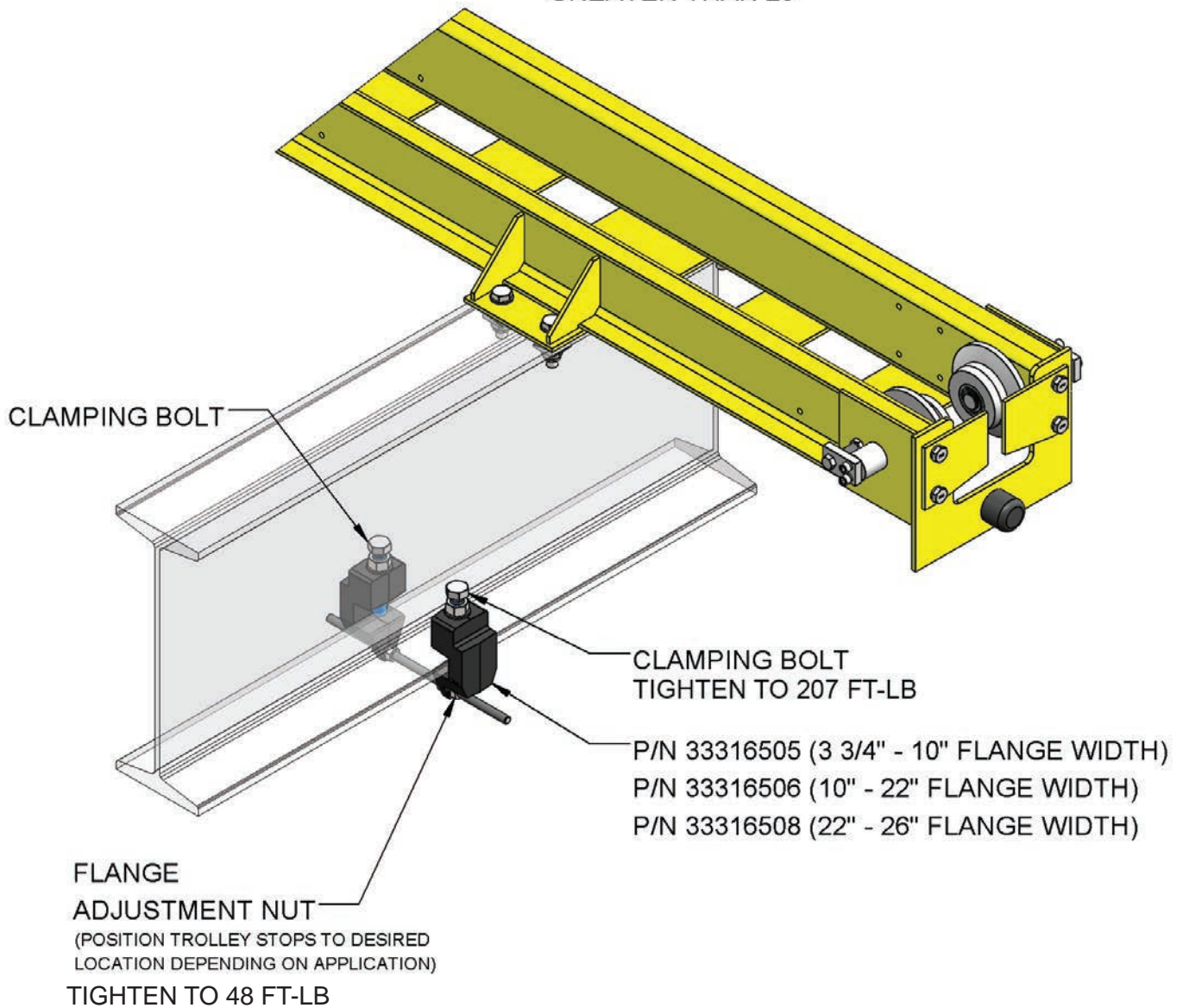
FLAT WASHER

SELF-LOCKING THIN HEX NUT

**CHAPTER 4**  
**END STOP ASSEMBLY**

## 4.A) END STOP ASSEMBLY

NOT FOR USE ON PATENTED TRACK,  
FLANGE WIDTHS LESS THAN 3 3/4", OR  
GREATER THAN 26"

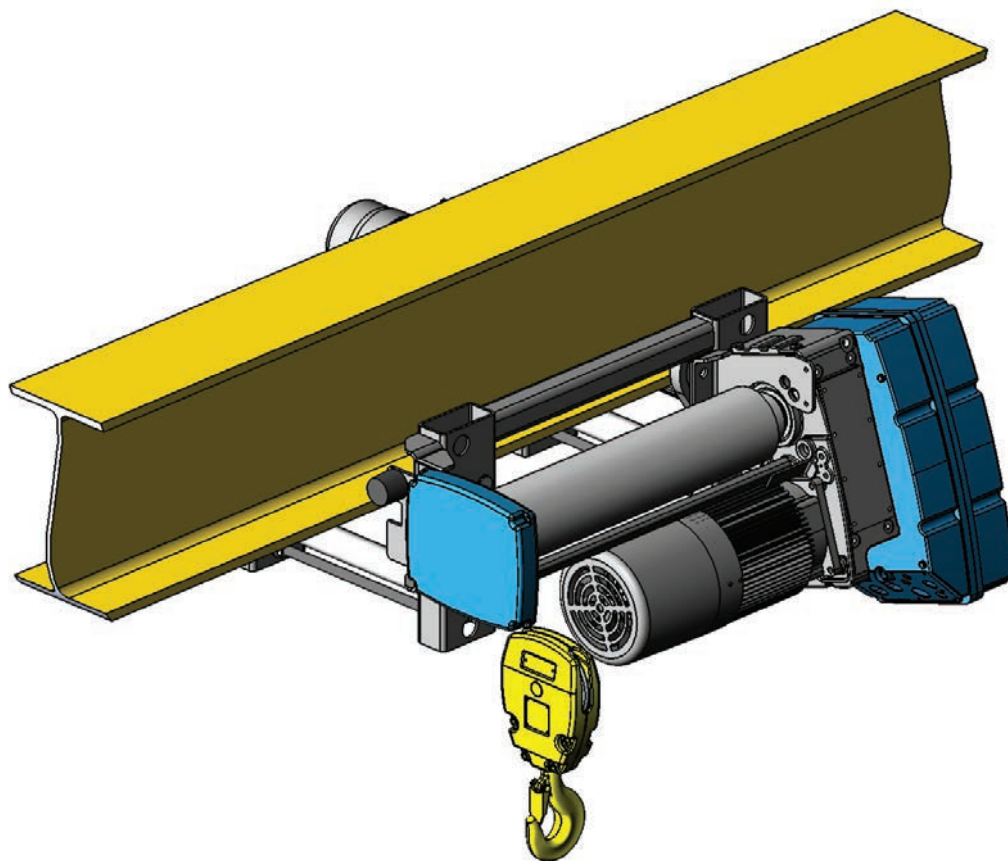


### **⚠ WARNING**

Trolley stops (clip angles) or end stop assemblies must be installed on both ends of the bridge beam to prevent hoist trolley from running off the end of the beam, which could result in injury to the operator and others and damage to the load and other property.

# CHAPTER 5

## MOUNTING HOIST ON GIRDER

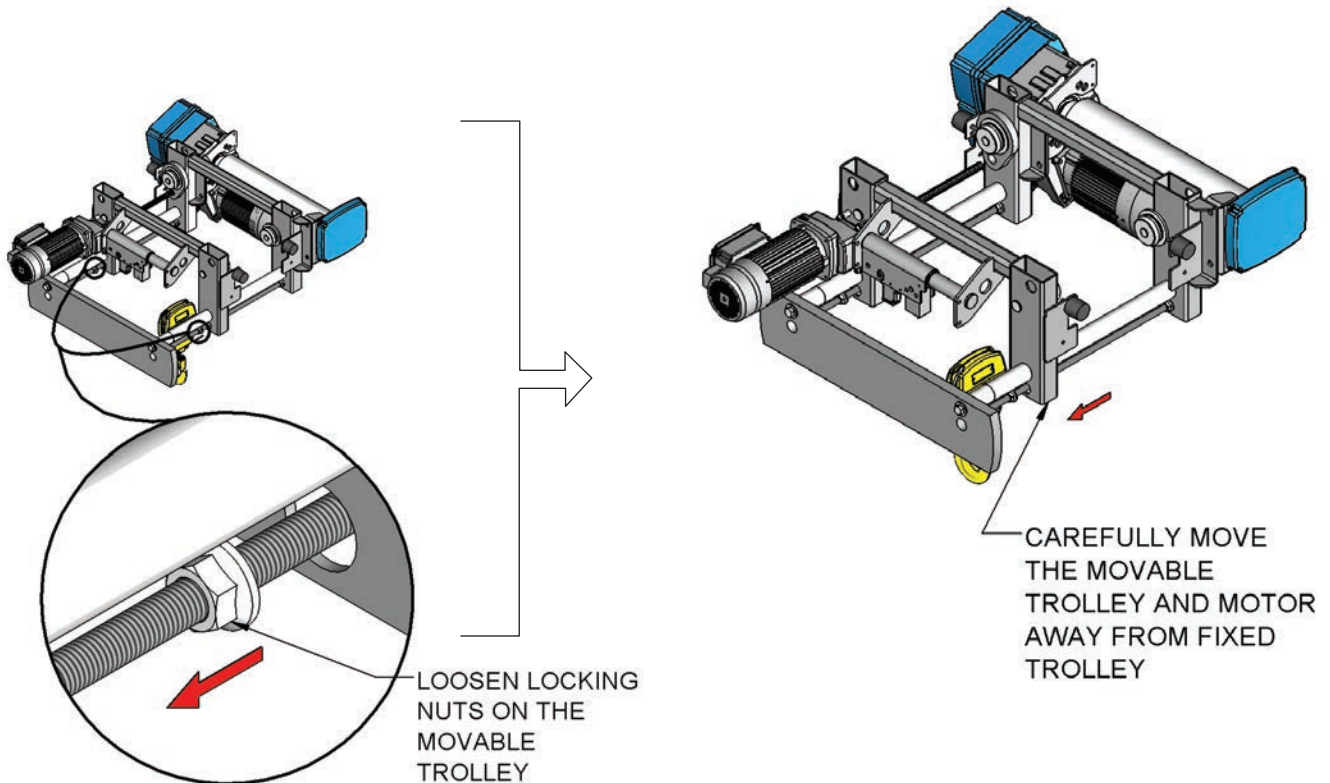
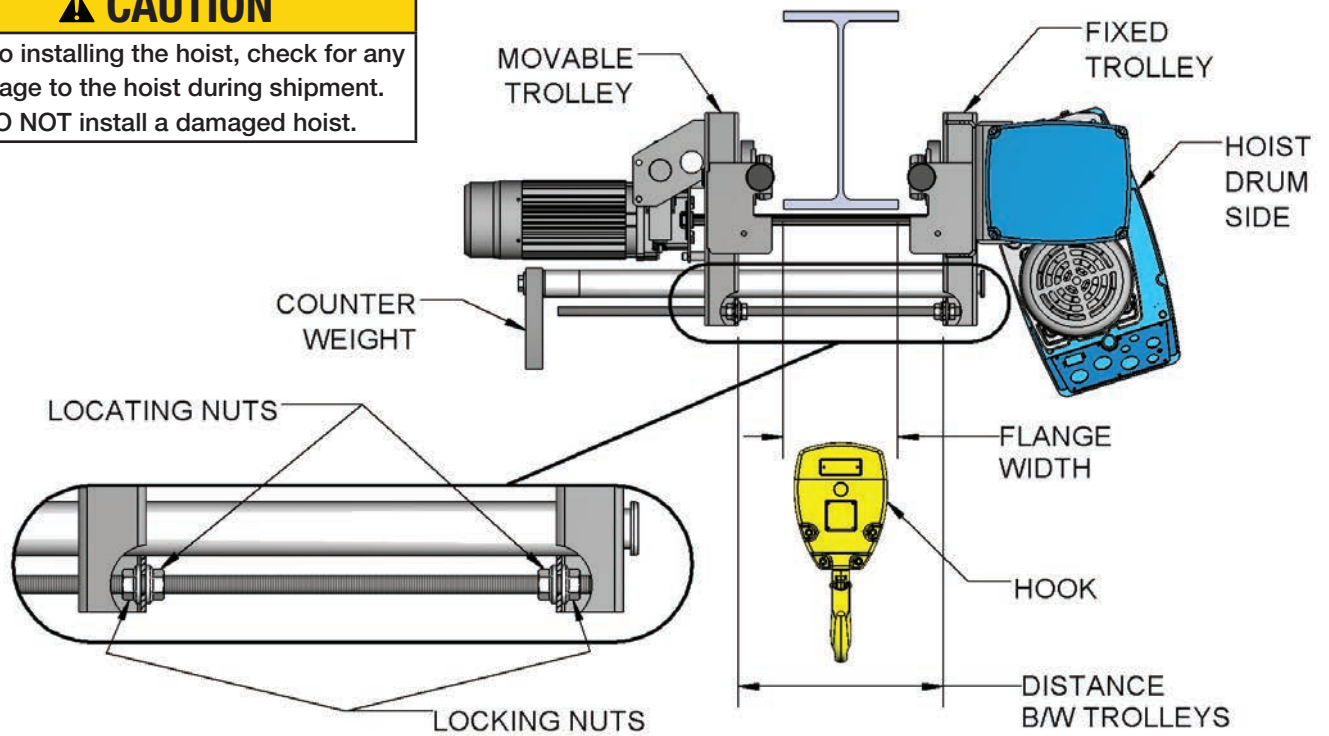




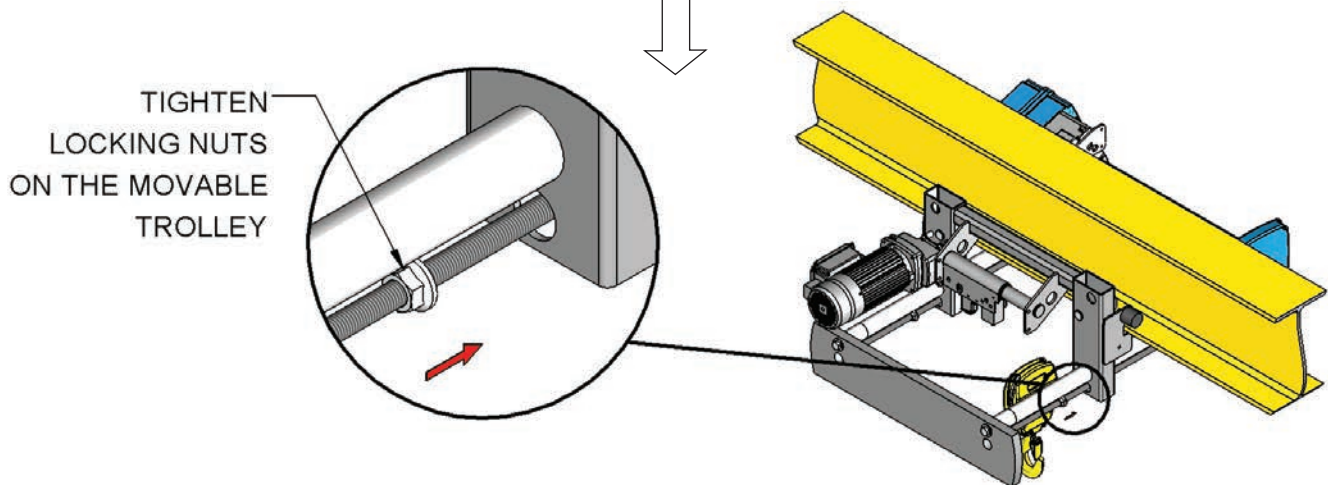
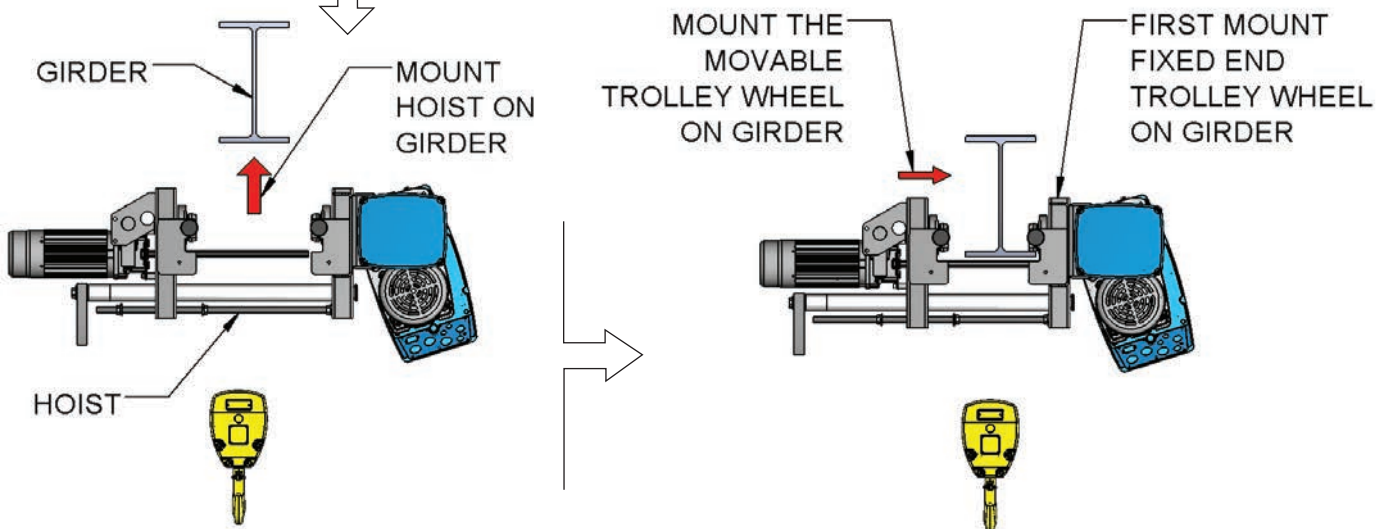
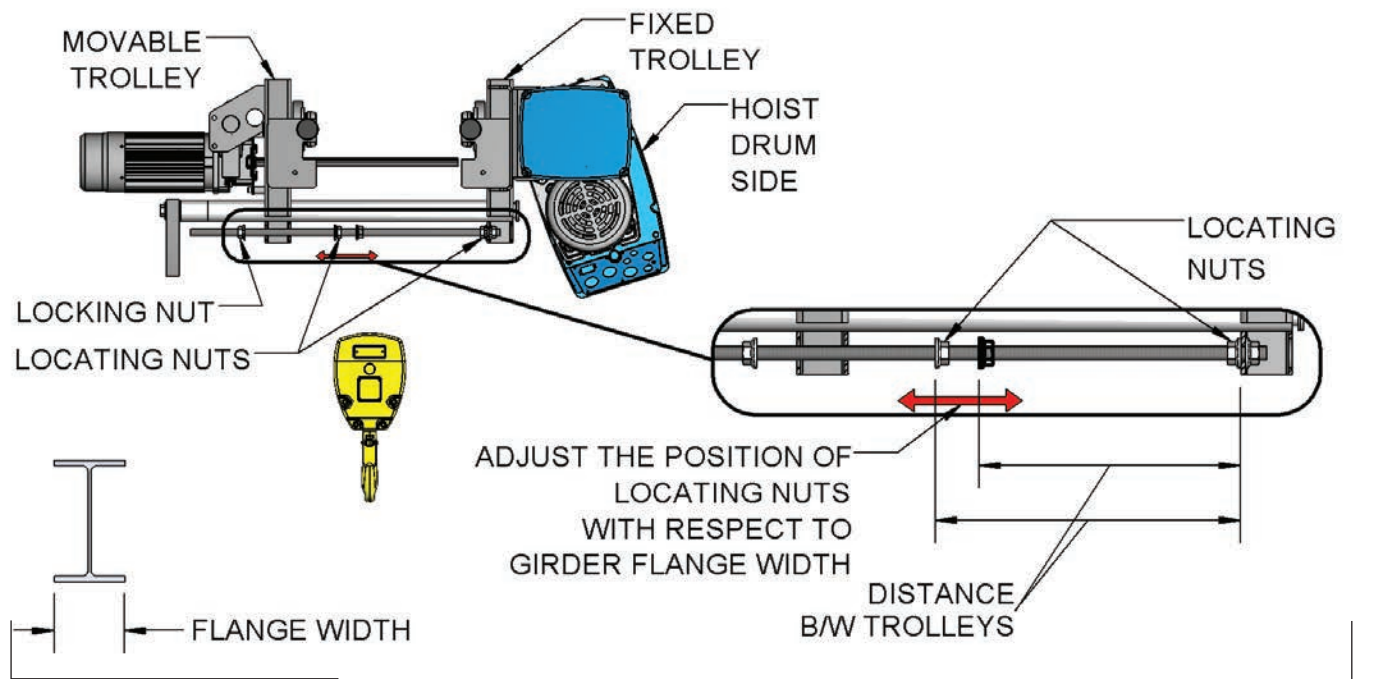
# STEP 1: PREPARATION FOR MOUNTING HOIST ON GIRDER

## ⚠ CAUTION

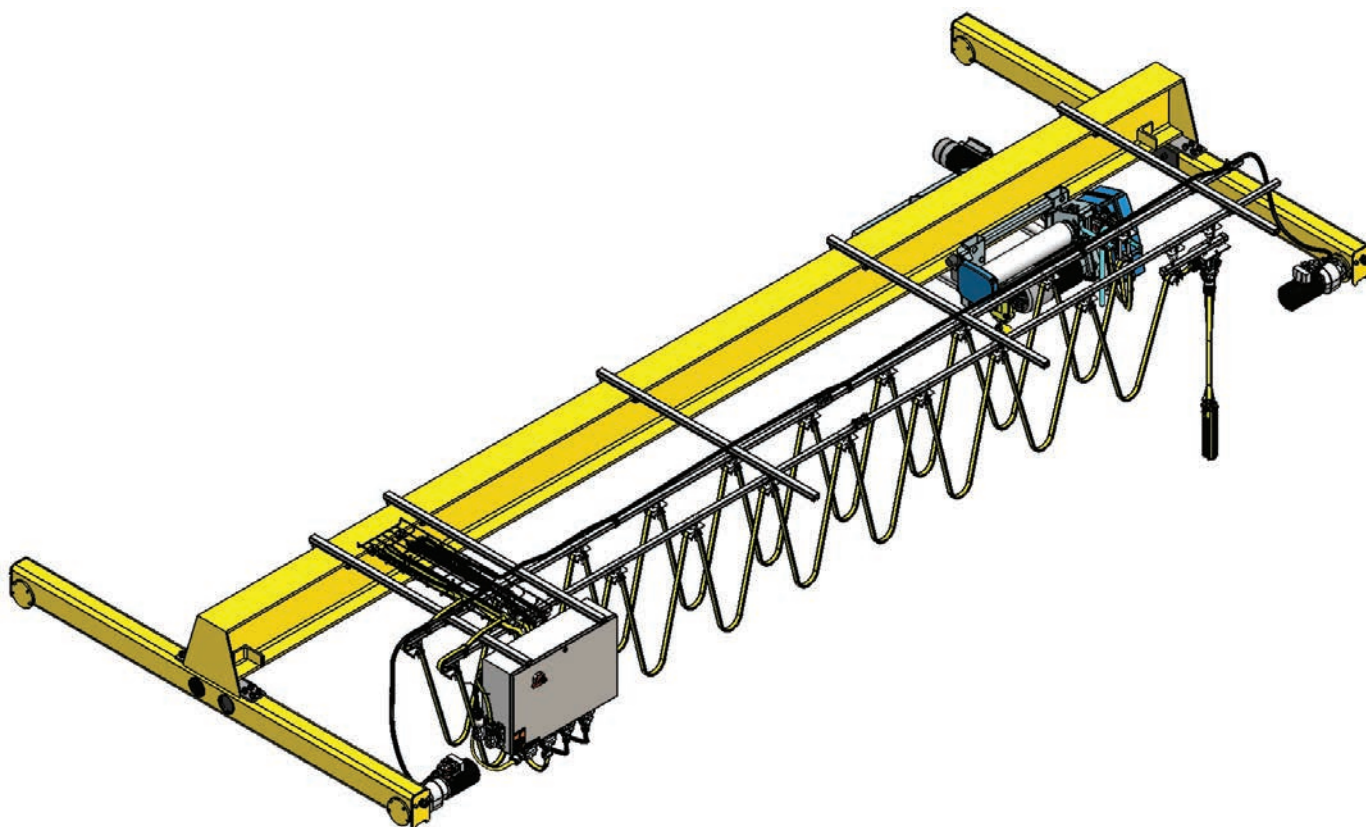
Prior to installing the hoist, check for any damage to the hoist during shipment. DO NOT install a damaged hoist.



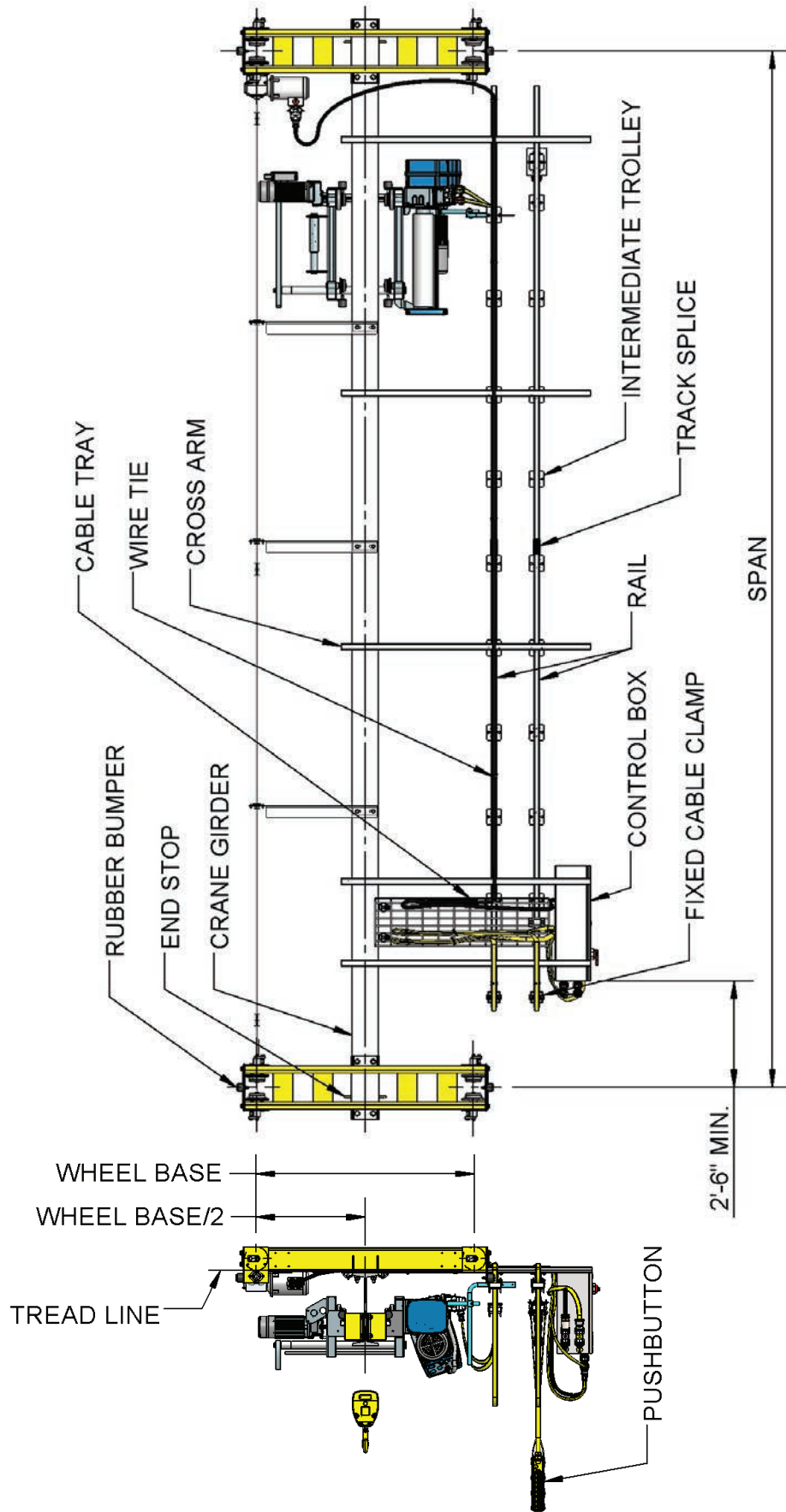
## STEP 2: MOUNTING HOIST ON GIRDER



# CHAPTER 6 FESTOON SYSTEM INSTALLATION



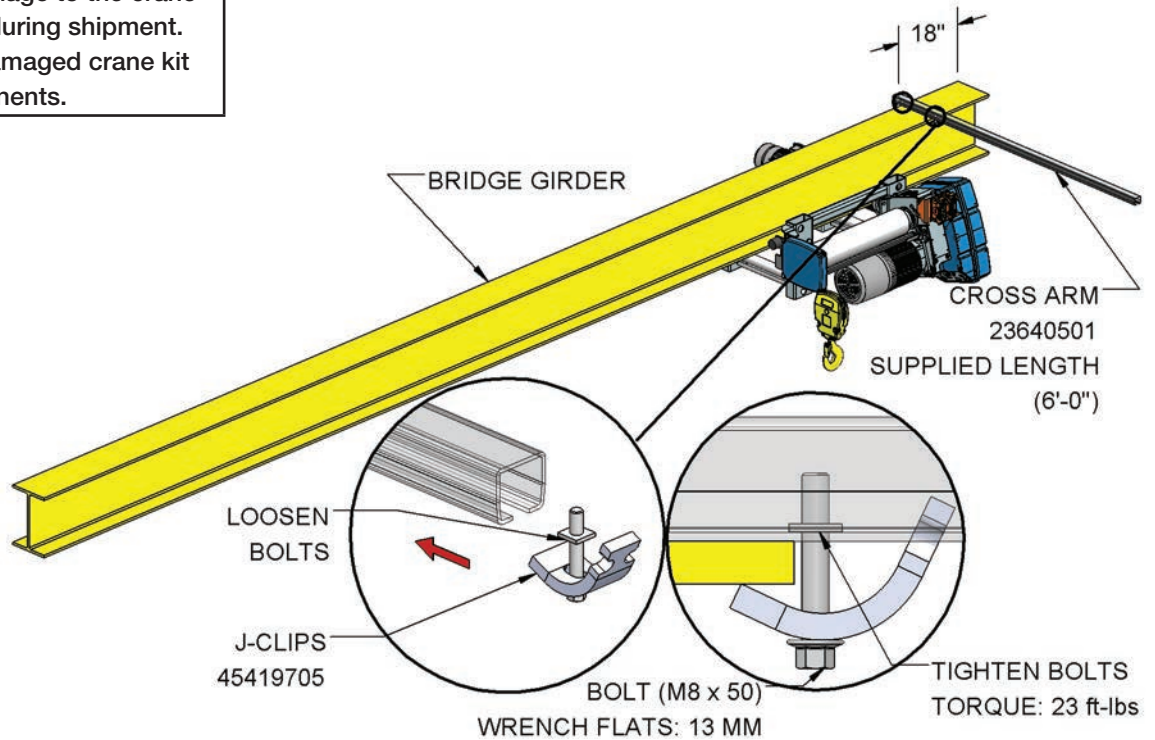
# 6.A) PLAN VIEW



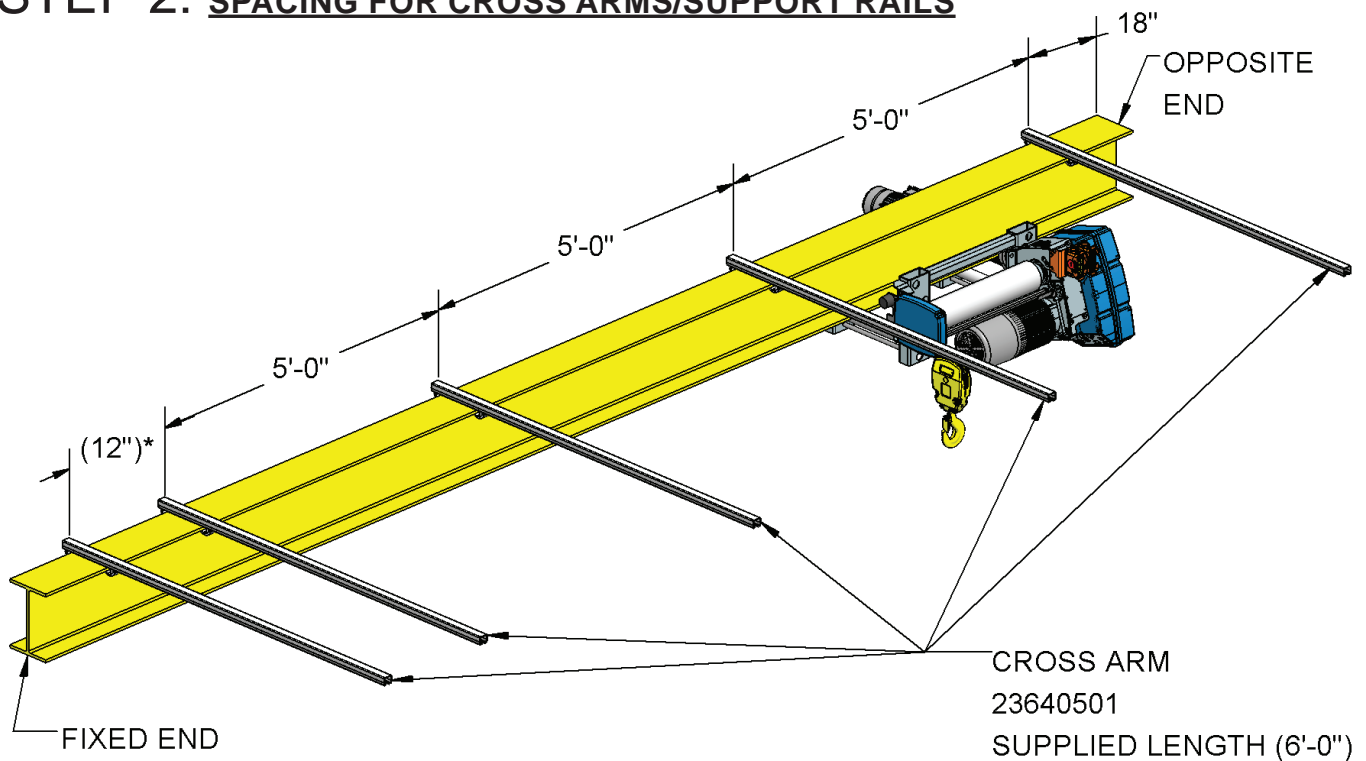
# STEP 1: CLAMPING CROSS ARM & CONTROL BOX SUPPORT RAILS

## ⚠ WARNING

Check for any damage to the crane kit components during shipment. DO NOT install damaged crane kit components.



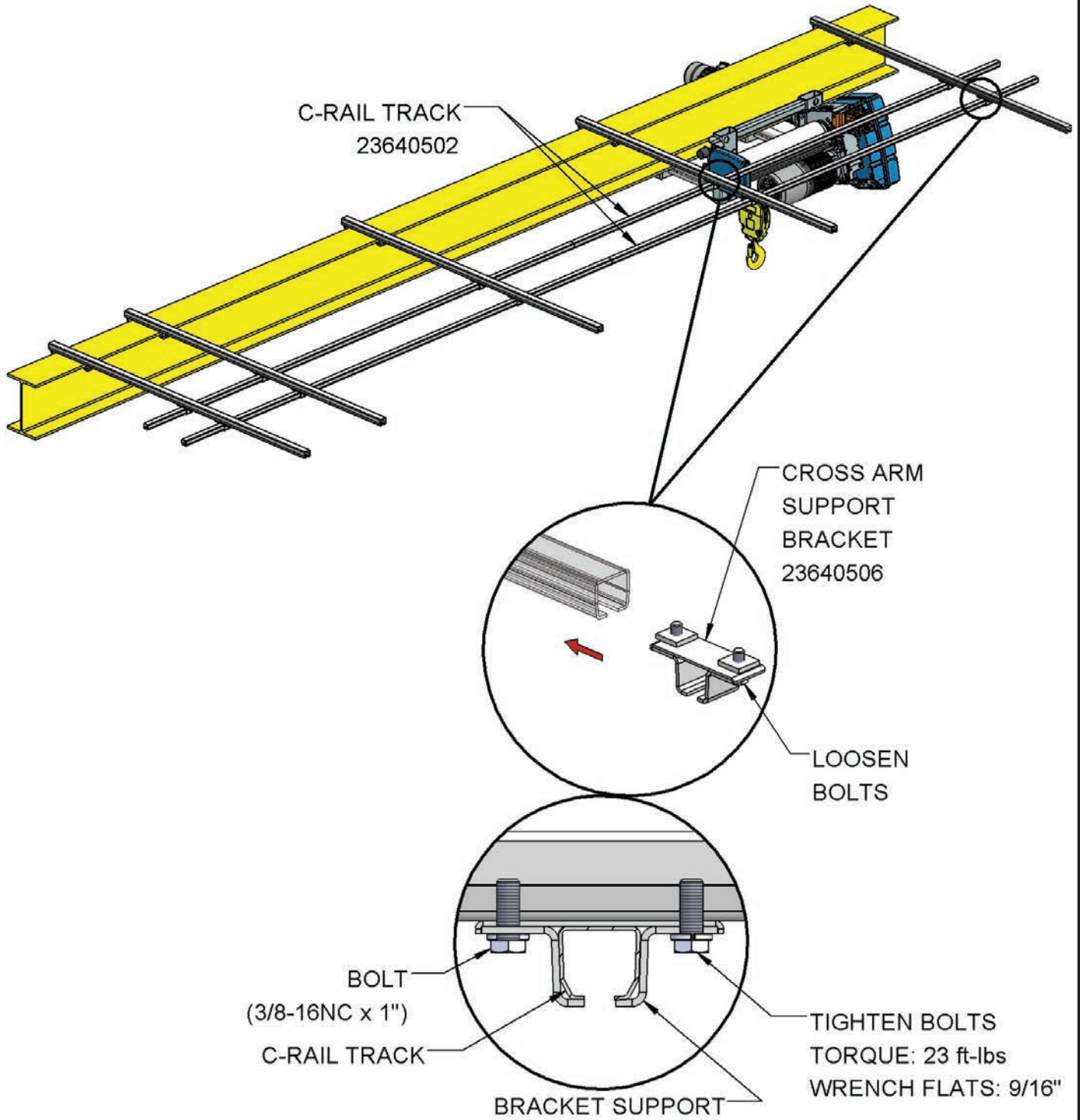
# STEP 2: SPACING FOR CROSS ARMS/SUPPORT RAILS



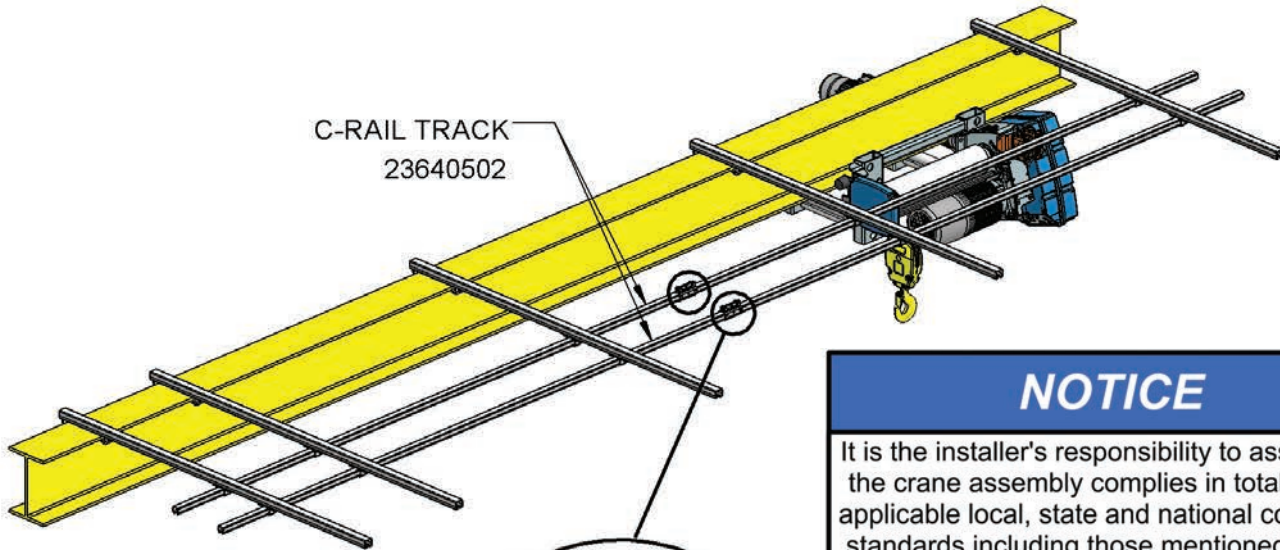
NOTE: MARK THE LOCATIONS OF THE CROSS ARM ON BRIDGE GIRDER BEFORE MOUNTING AS PER THE ABOVE DIMENSIONS.

\* DIMENSION TO SUIT CONTROL BOX.

# STEP 3: C-RAIL MOUNTING



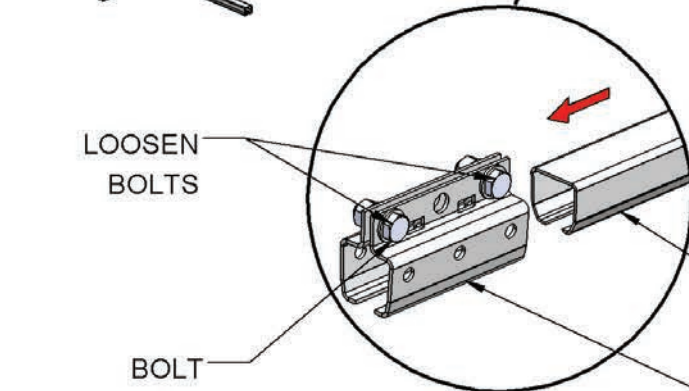
# STEP 4: C-RAIL JOINT ASSEMBLY



C-RAIL TRACK  
23640502

**NOTICE**

It is the installer's responsibility to assure that the crane assembly complies in total with all applicable local, state and national codes and standards including those mentioned herein. Crane wiring should be done by a licensed electrician and be in accordance with the National Electric Code (ANSI/NFPA 70).

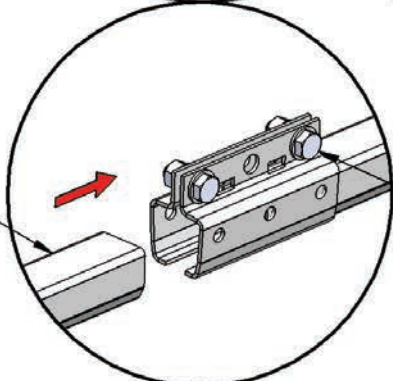


LOOSEN  
BOLTS

INSERT "C-RAIL" TRACK  
FROM ONE END

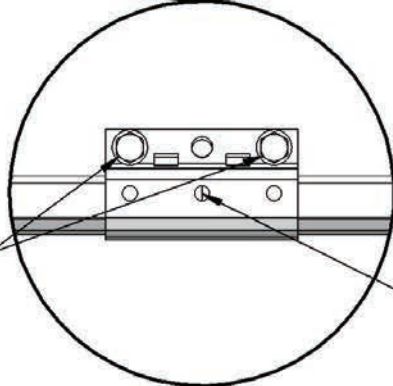
BOLT  
(3/8-16NC x 1")

C-RAIL JOINT ASSEMBLY  
23640507



INSERT "C-RAIL" TRACK  
FROM OTHER END

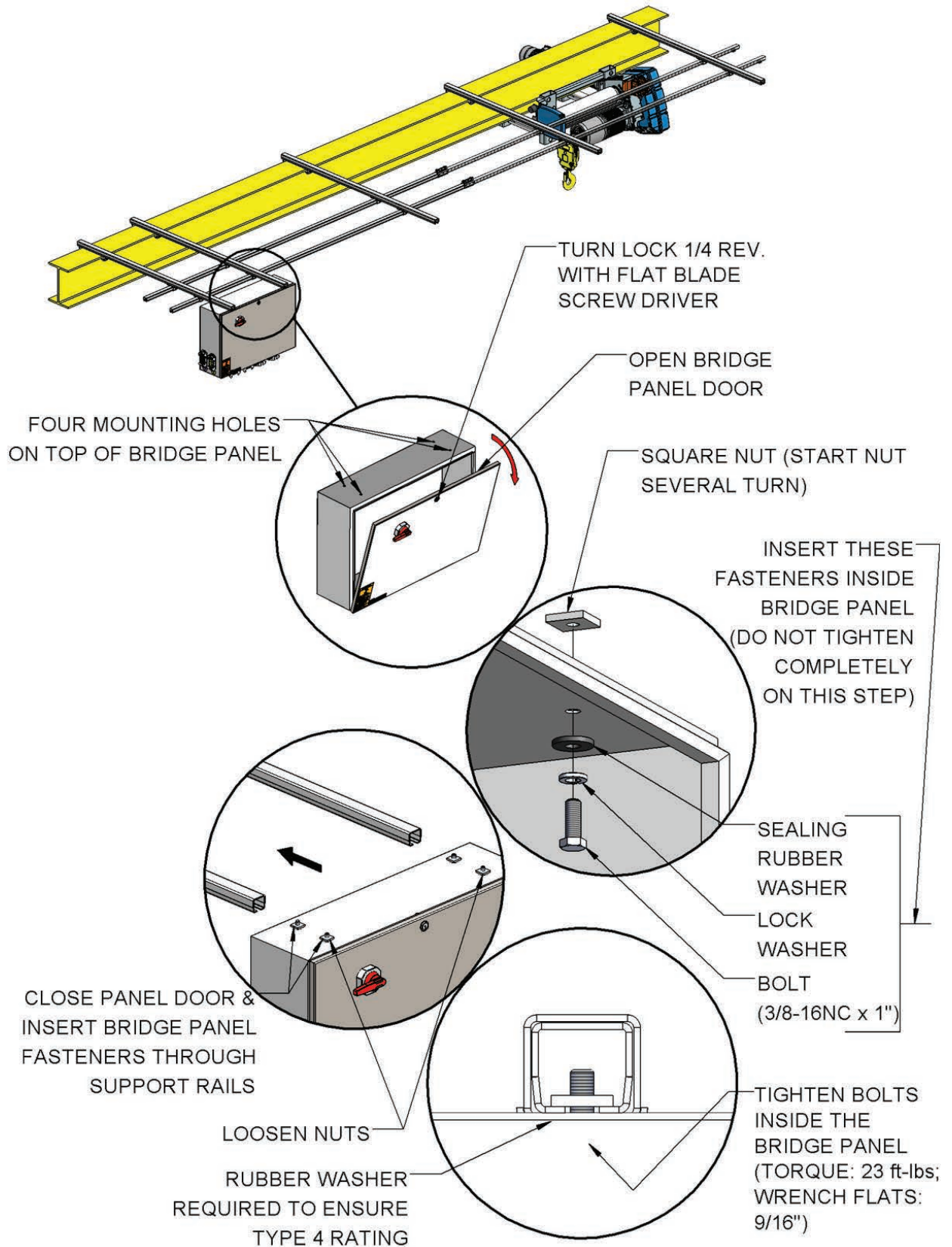
HAND TIGHTEN BOLT  
AT THIS END



EQUALLY TIGHTEN  
BOTH THE BOLTS  
(TORQUE: 23 ft-lbs;  
WRENCH FLATS: 9/16")

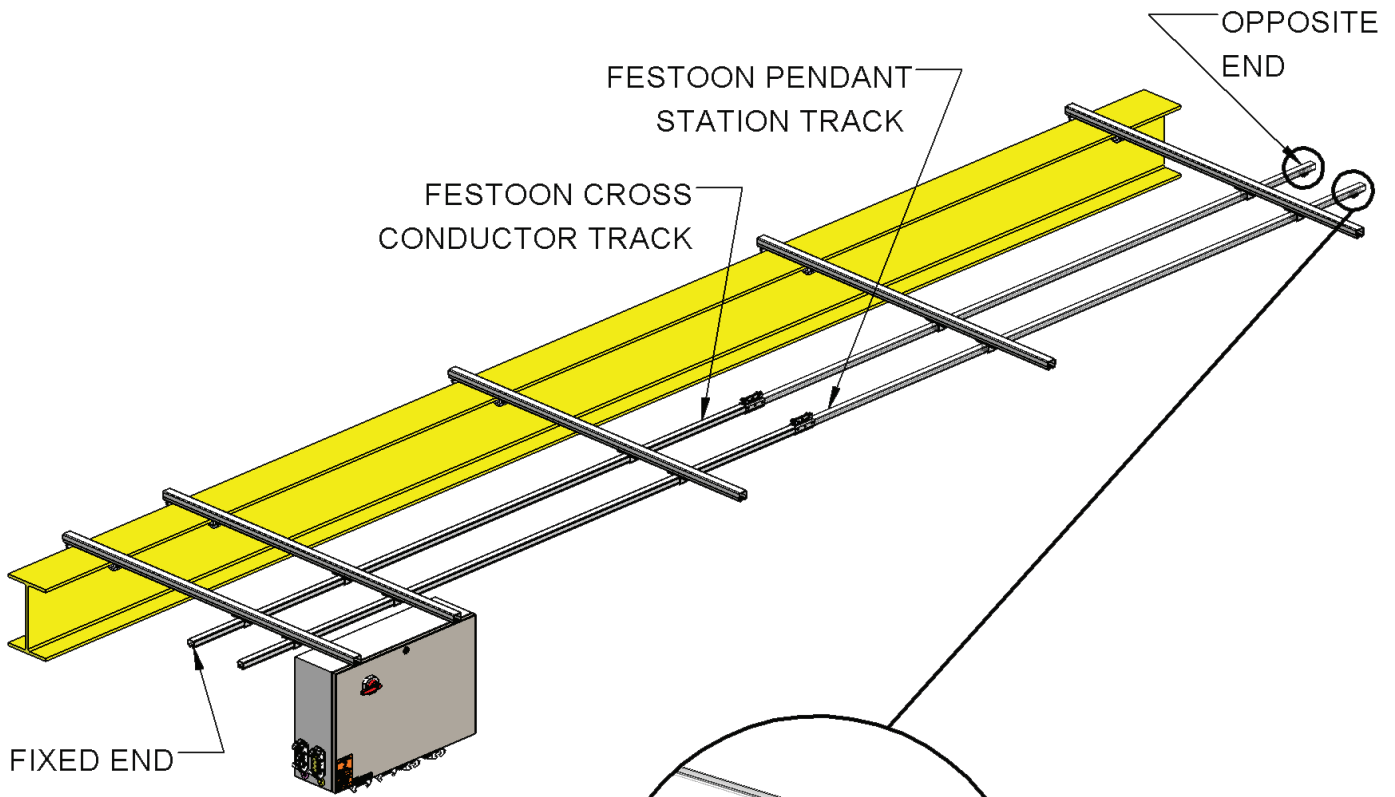
NO GAP BETWEEN C-TRACKS  
AT "PEEP" HOLE

# STEP 5: MOUNTING BRIDGE PANEL

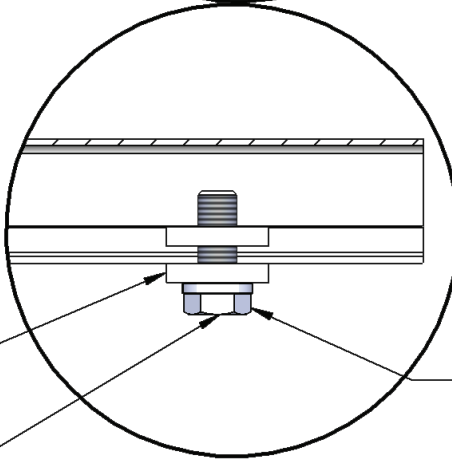
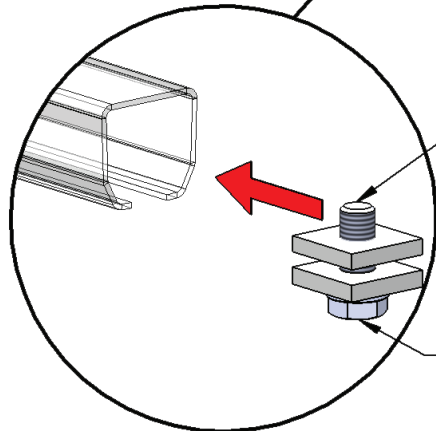




# STEP 6: END STOP ASSEMBLY



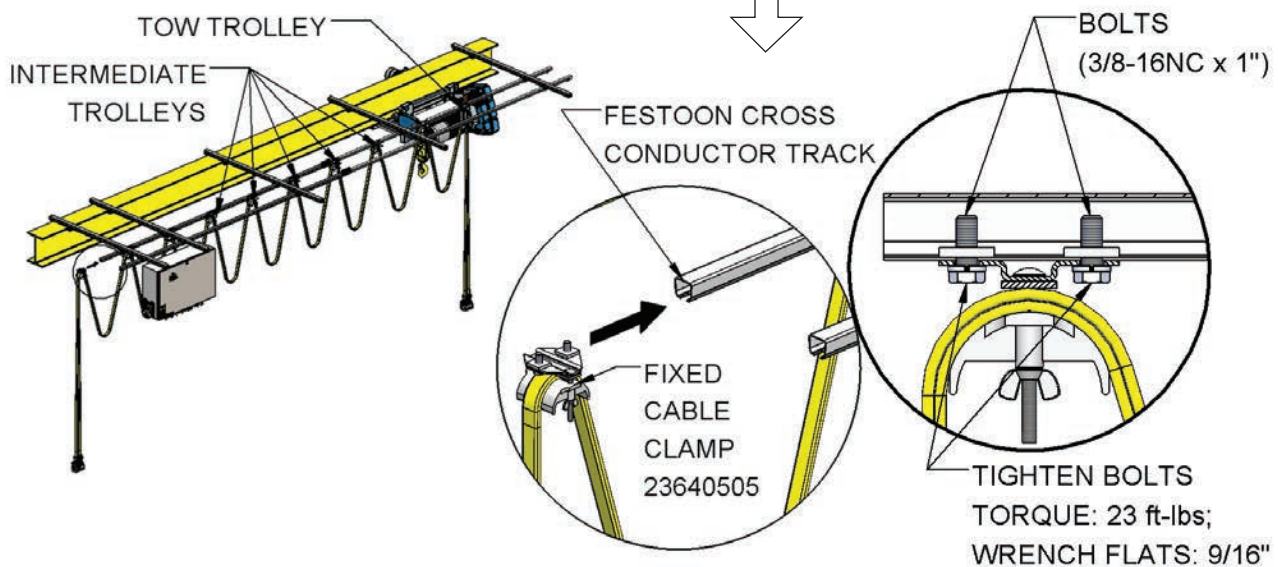
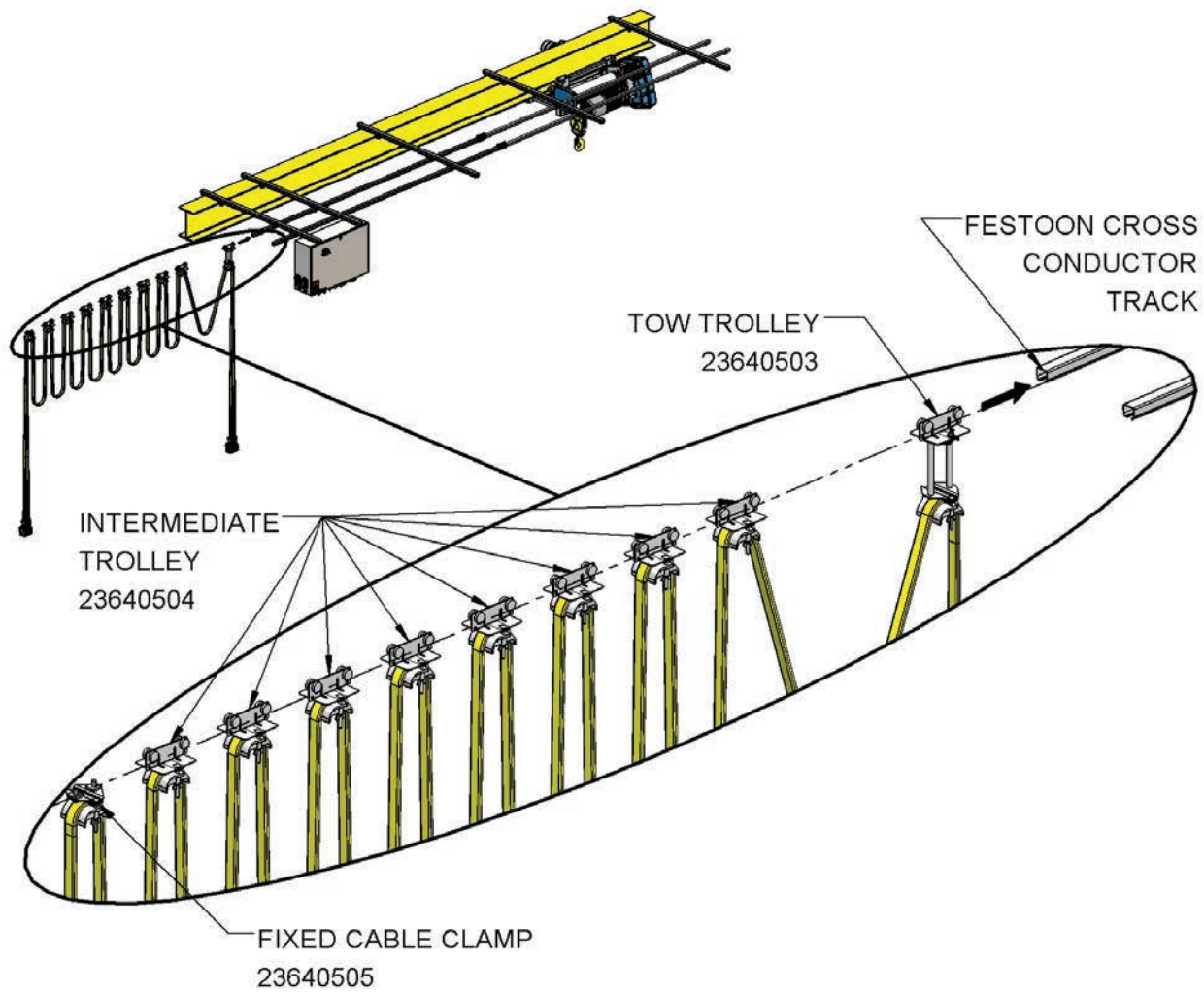
\* DO NOT PUT END STOPS ON FIXED END



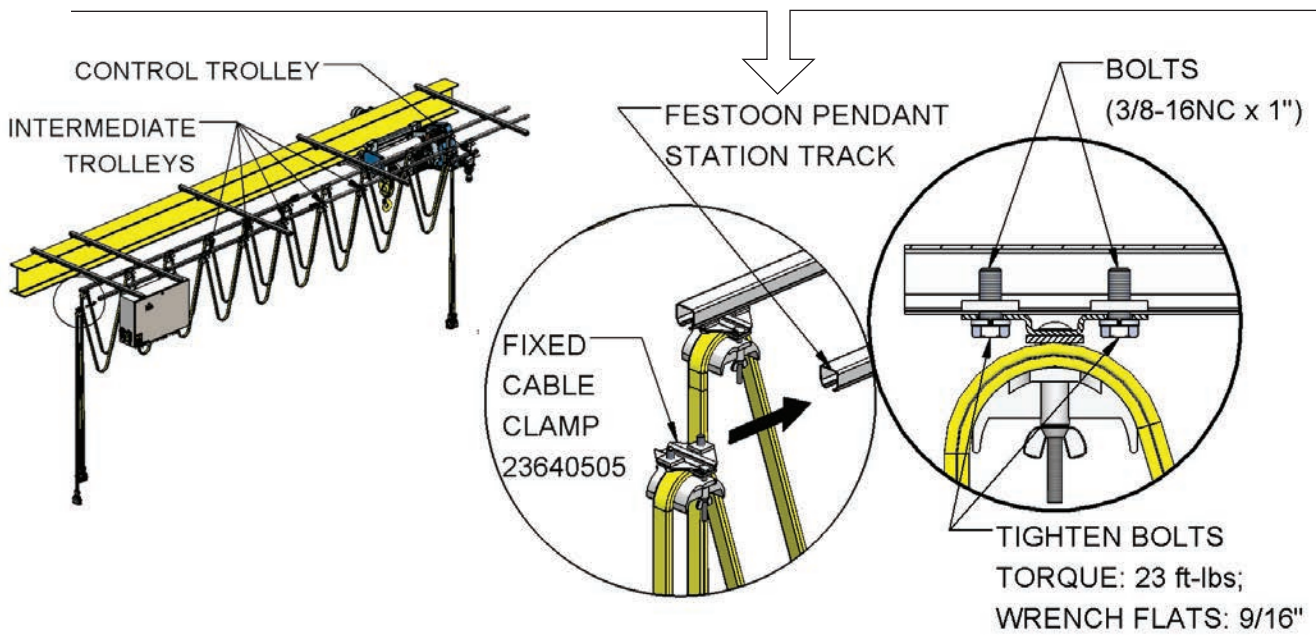
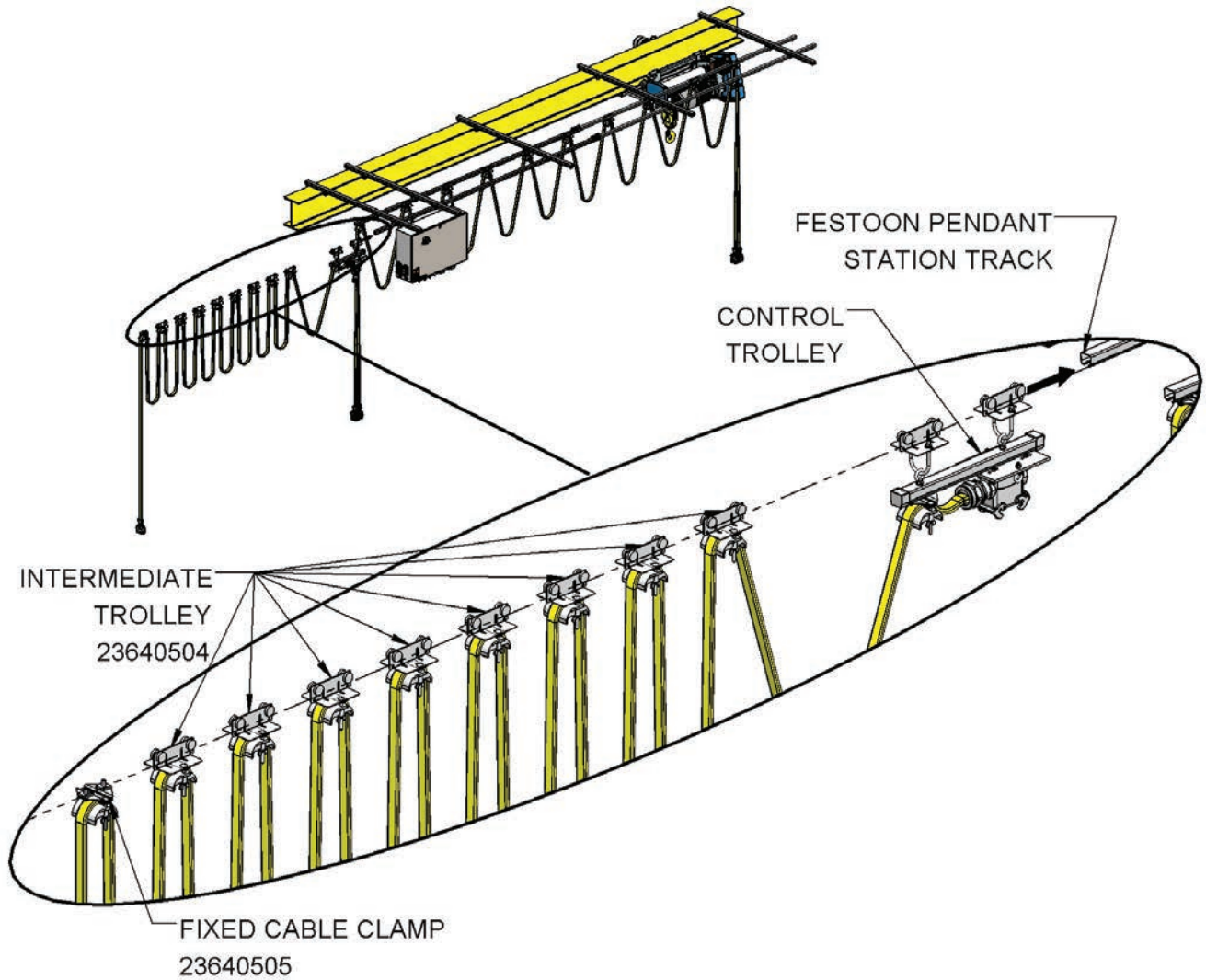
END STOP  
236440508  
BOLT  
(3/8-16NC x 1")

FULLY TIGHTEN  
BOLTS  
TORQUE: 23 ft-lbs;  
WRENCH FLATS: 9/16"

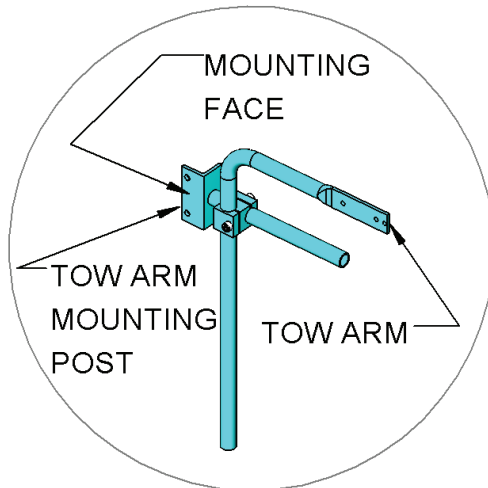
# STEP 7: HOIST CABLE ASSEMBLY



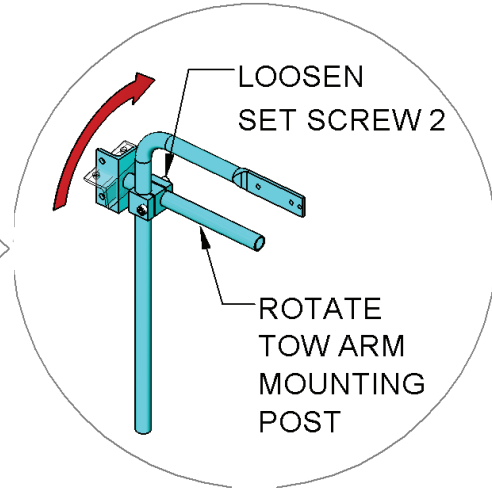
# STEP 8: CONTROL PENDANT CABLE ASSEMBLY



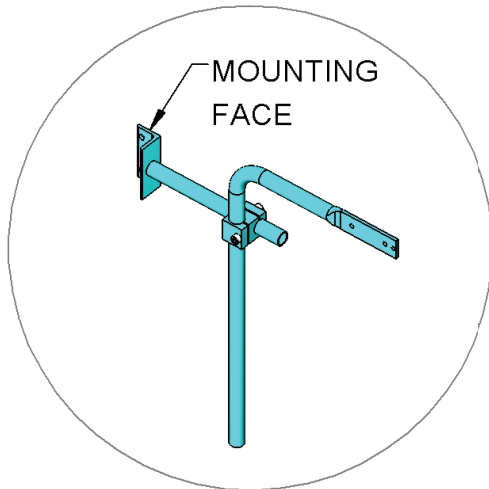
# STEP 9: TOW ARM KIT PREPARATION



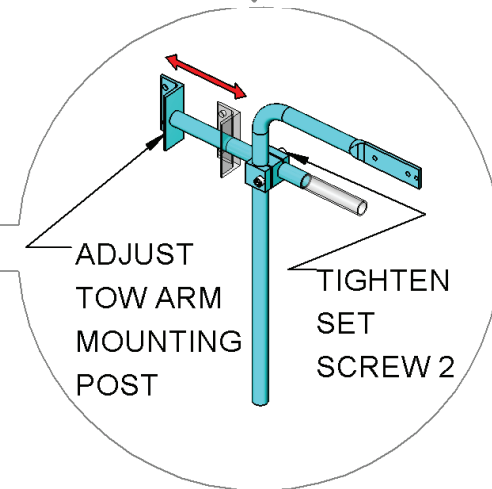
POSITION "AS SUPPLIED"



ROTATE 180°

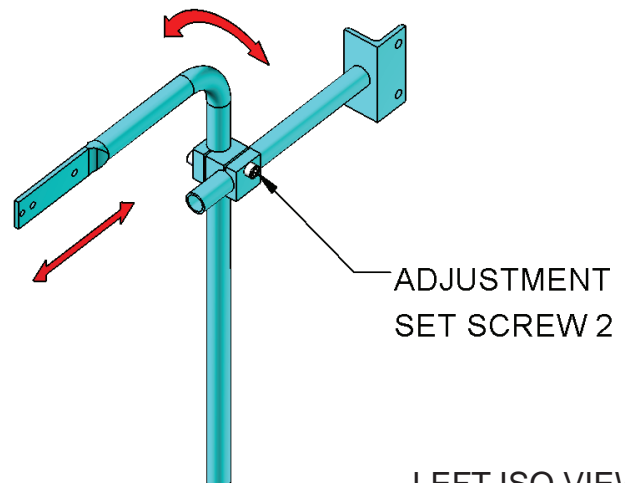
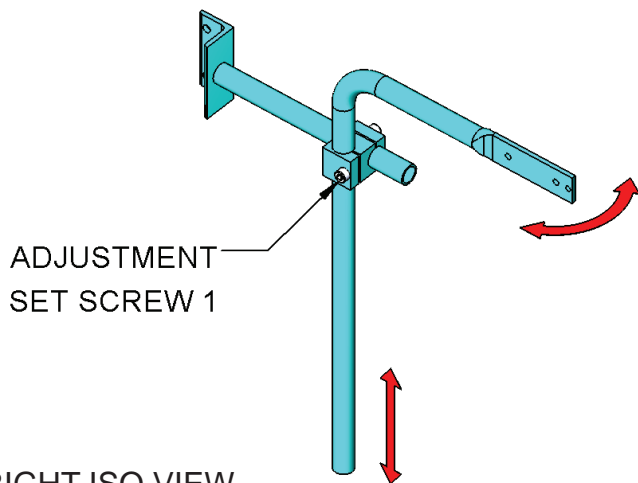


POSITION DESIRED FOR APPLICATION

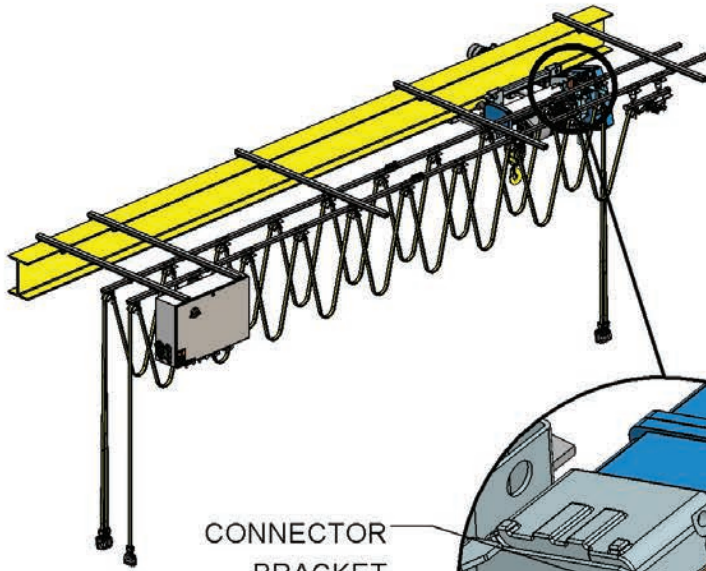


ADJUST THE POSITION

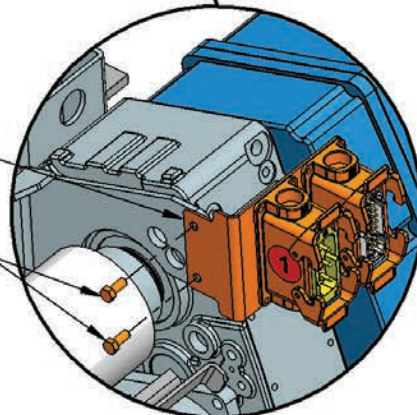
## TOW ARM ADJUSTMENTS



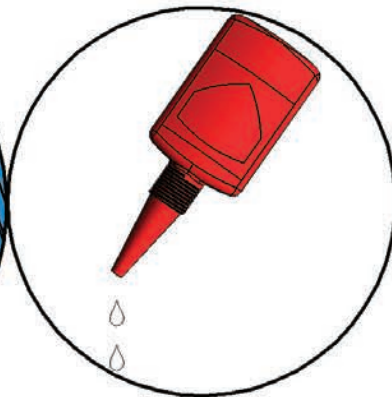
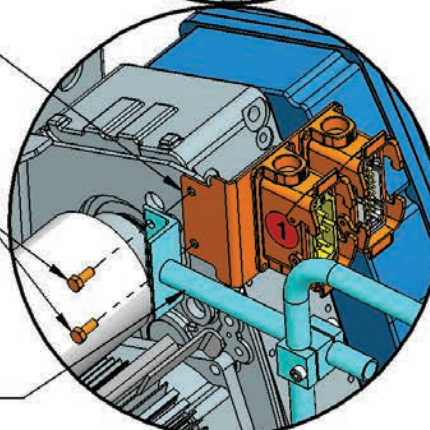
# STEP 10: TOW ARM KIT PREPARATION



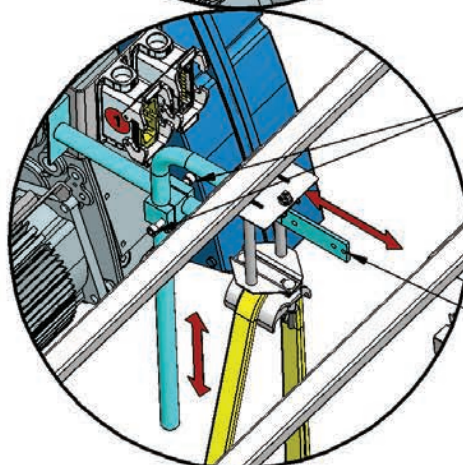
CONNECTOR BRACKET  
 REMOVE HEX BOLTS (M8 x 25)  
 WRENCH FLATS: 13 MM



CONNECTOR BRACKET  
 ASSEMBLE TOW ARM USING HEX BOLTS (M8 x 25)  
 WRENCH FLATS: 13 MM (TORQUE: 23 ft-lbs)  
 TOW ARM MOUNTING POST



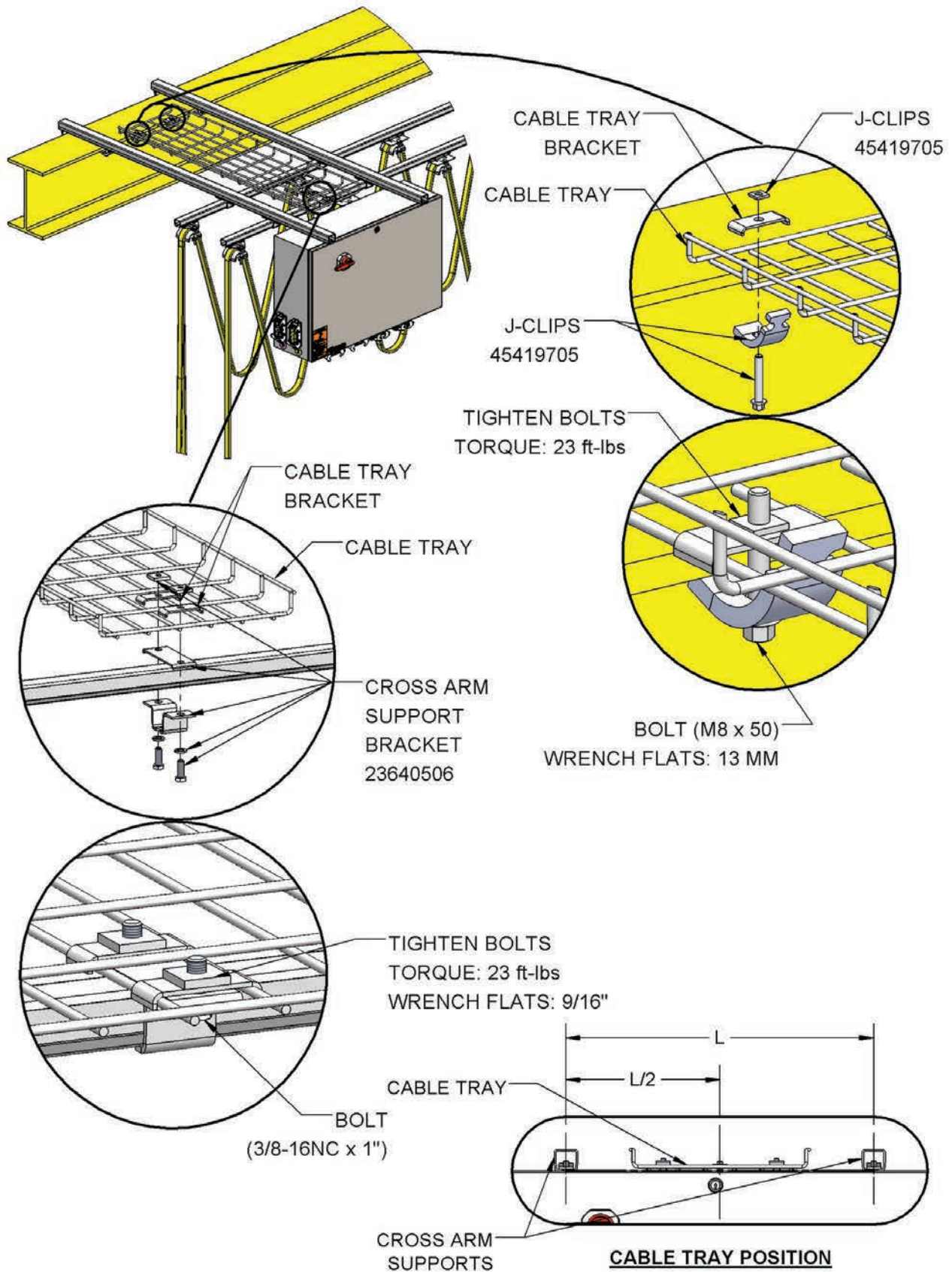
THREADLOCKER (RECOMMENDED)



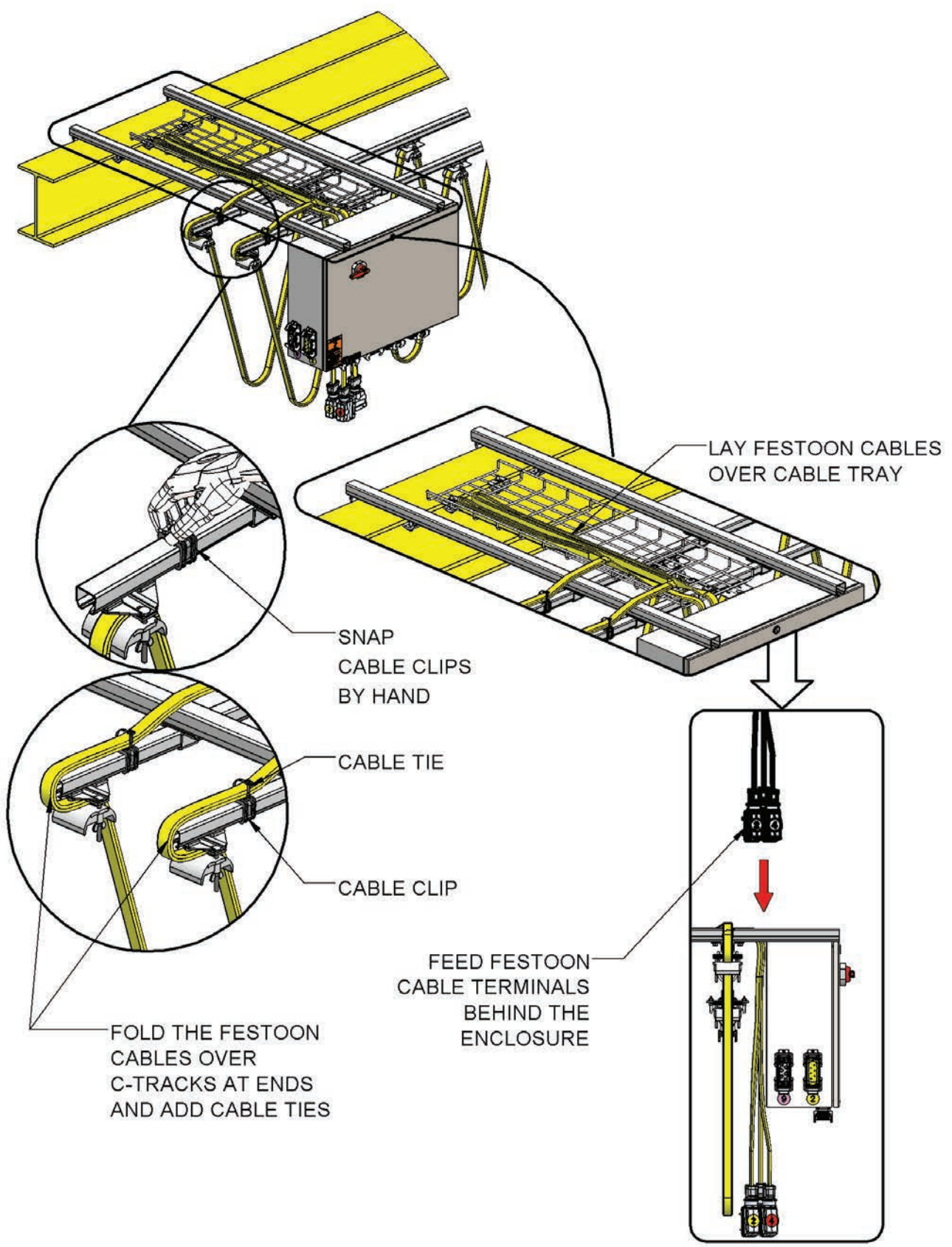
LOOSEN BOTH THE SET SCREWS & ADJUST TOW ARM TO FIT TOW TROLLEY

TOW ARM

# STEP 11: CABLE TRAY INSTALLATION

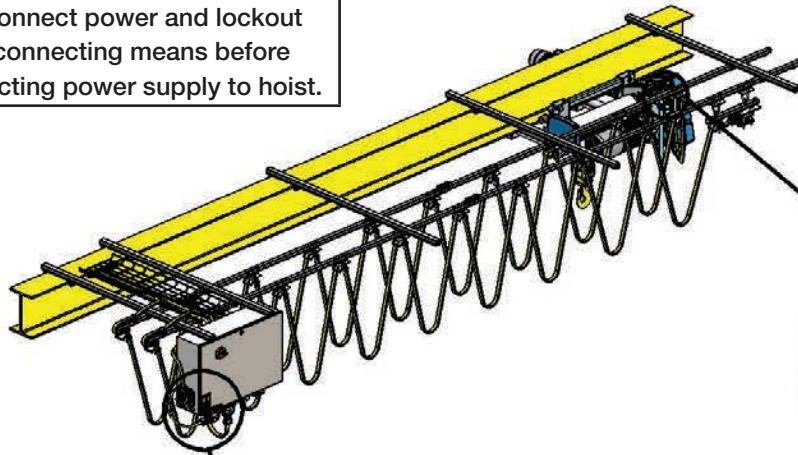


# STEP 12: PLACING FESTOON CABLES ON CABLE TRAY

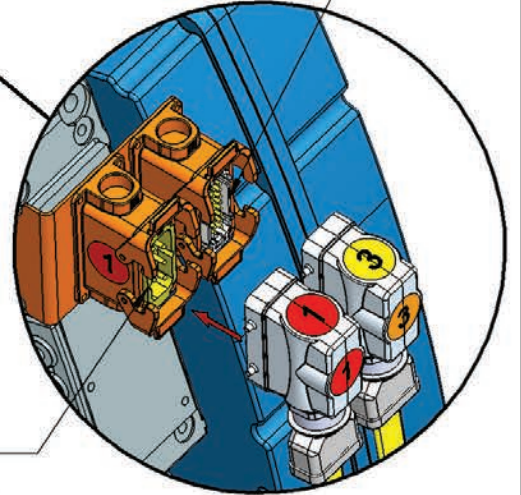


# STEP 13: FESTOON CABLE CONNECTION

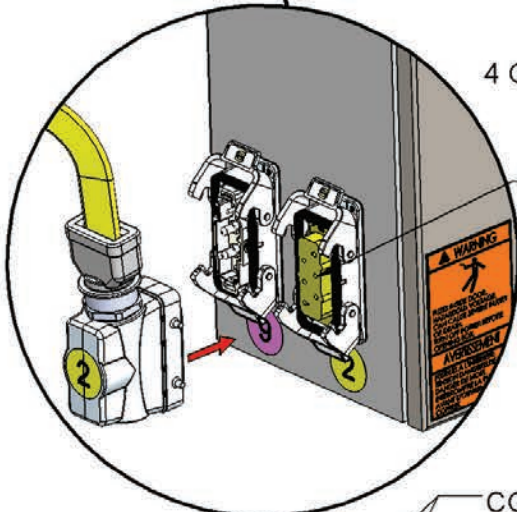
**⚠ DANGER**  
 Disconnect power and lockout  
 disconnecting means before  
 connecting power supply to hoist.



CONNECTOR #3  
 16 PIN CONNECTION



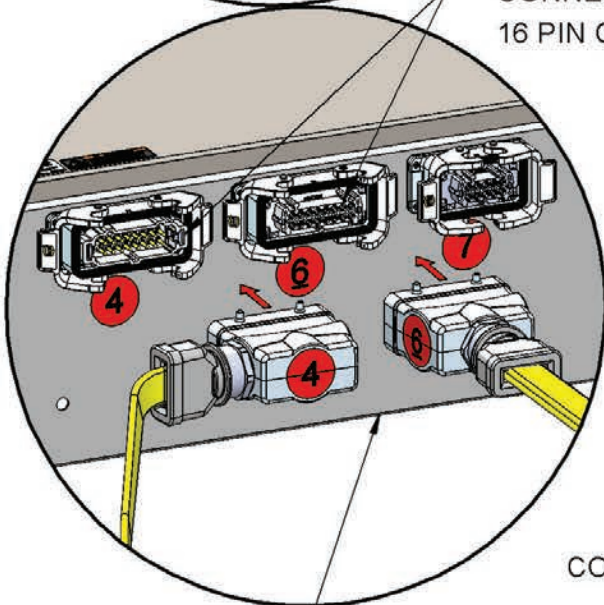
CONNECTOR #1  
 4 OR 6 PIN CONNECTION



CONNECTOR #2  
 4 OR 6 PIN CONNECTION

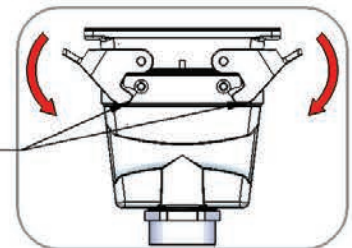
**⚠ WARNING**  
 DO NOT UNPLUG CONNECTORS WHILE CIRCUIT  
 IS ENERGIZED.  
 BEFORE PLUGGING IN CONNECTORS REMOVE  
 POWER FROM SYSTEM.

CONNECTORS #4 & #6  
 16 PIN CONNECTION

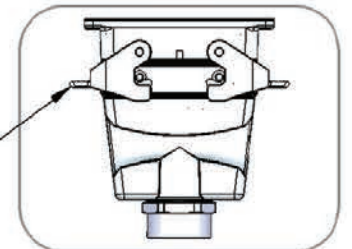


BOTTOM SIDE OF  
 BRIDGE PANEL

### LOCKING CONNECTORS



AFTER INSERTING  
 CABLE CONNECTORS  
 ROTATE THE LATCHES  
 BY HAND AND  
 LOCK SECURELY



CONNECTOR LATCHES IN  
 LOCKED CONDITION

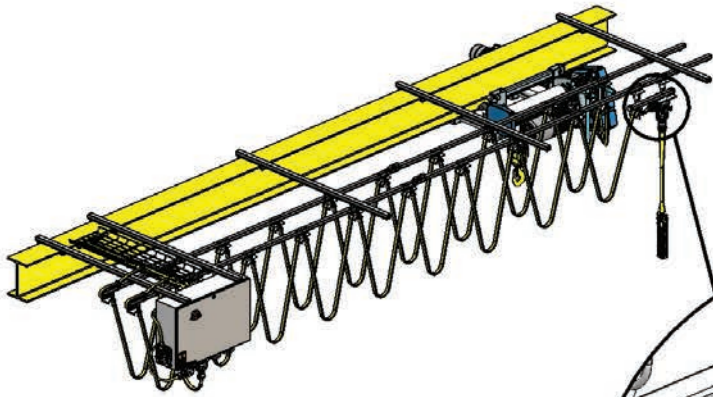


# STEP 14: PUSH-BUTTON PENDANT ASSEMBLY

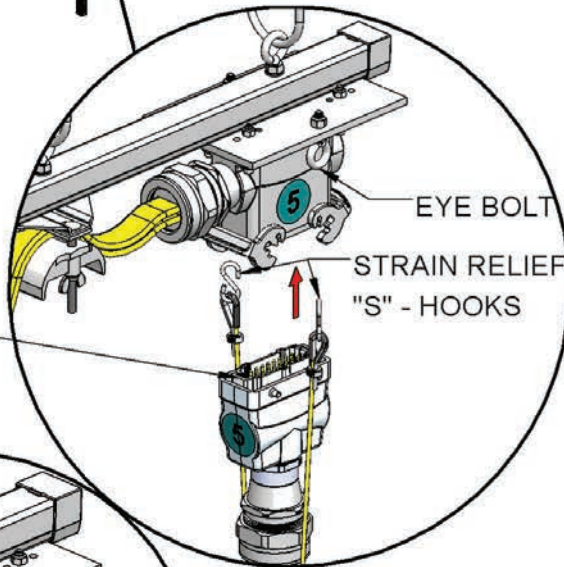
## **⚠ WARNING**

DO NOT UNPLUG CONNECTORS WHILE CIRCUIT IS ENERGIZED.

BEFORE PLUGGING IN CONNECTORS REMOVE POWER FROM SYSTEM.

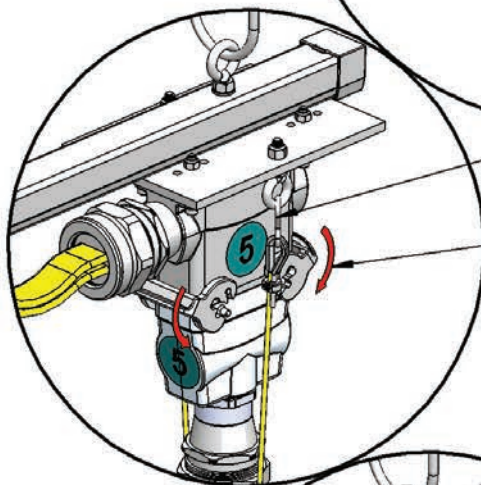


CONNECTOR #5  
16 PIN CONNECTION



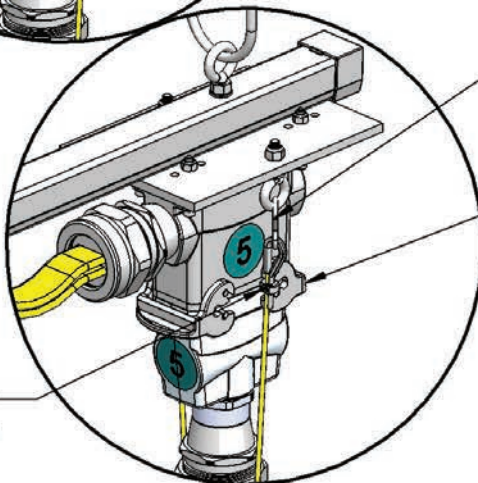
EYE BOLT

STRAIN RELIEF  
"S" - HOOKS



HANG "S" - HOOKS  
ON EYE BOLTS

AFTER INSERTING THE  
PENDANT CONNECTOR  
ROTATE THE LATCHES  
BY HAND TO SECURELY  
LOCK THE CONNECTOR



"S" - HOOKS  
HUNG FROM  
EYE BOLTS

CONNECTOR  
LATCHES IN  
LOCKED CONDITION

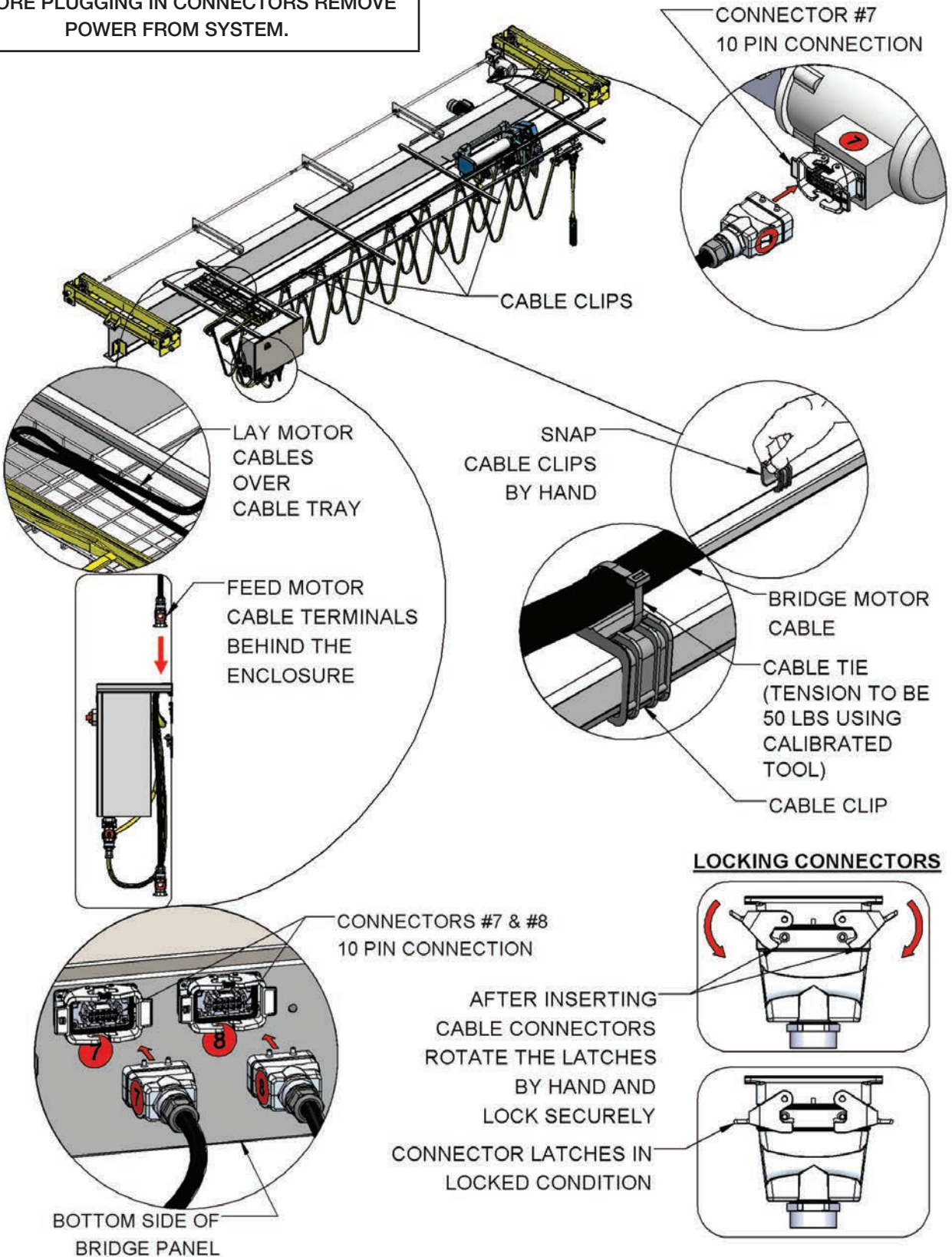
IF NECESSARY  
LOOSEN STRAIN RELIEF SCREW  
TO REMOVE EXCESS SLACK FOR  
PENDANT CABLE

# STEP 15: BRIDGE MOTOR CABLE CONNECTION

## ⚠ WARNING

DO NOT UNPLUG CONNECTORS WHILE CIRCUIT IS ENERGIZED.

BEFORE PLUGGING IN CONNECTORS REMOVE POWER FROM SYSTEM.



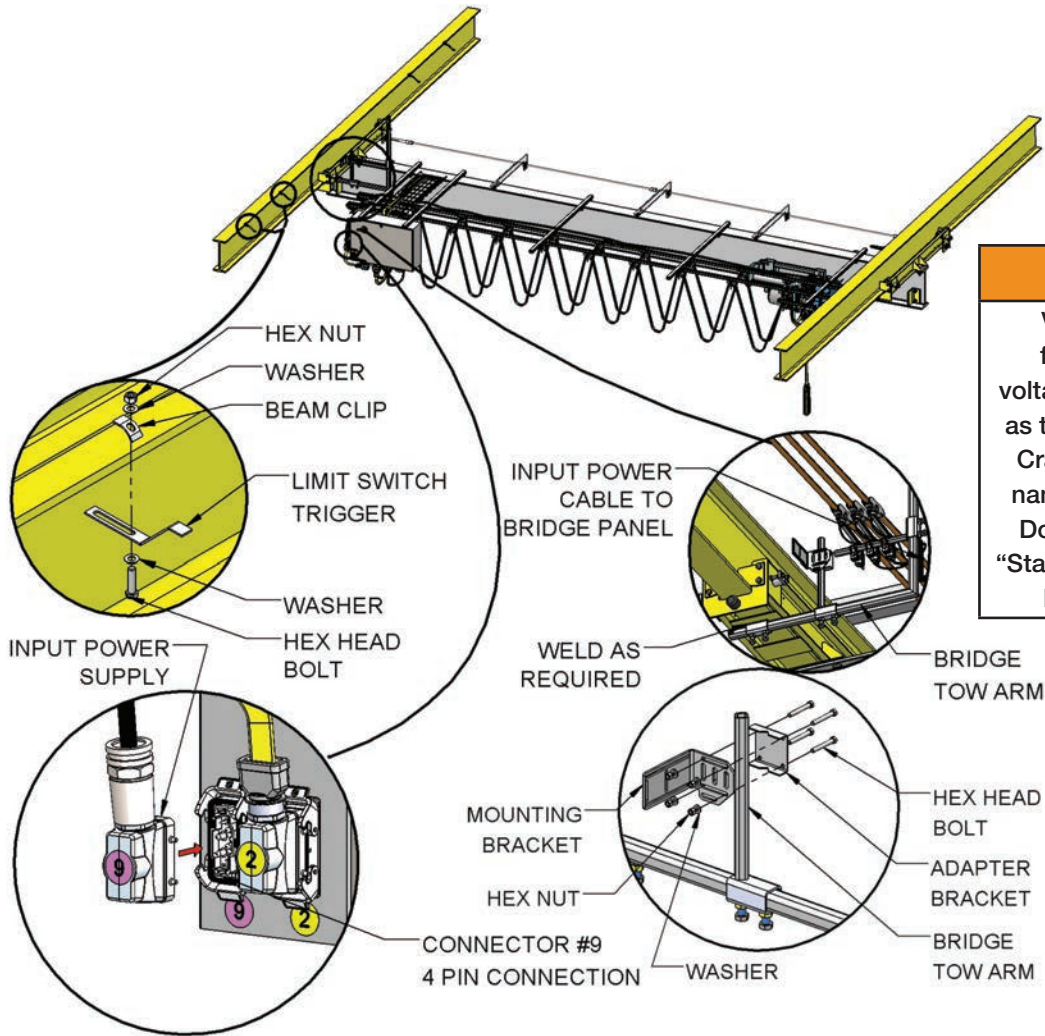
# STEP 16: BRIDGE TOW ARM INSTALLATION

## ⚠ DANGER

Disconnect power and lockout disconnecting means before connecting power supply cable to runway electrification system.

## ⚠ WARNING

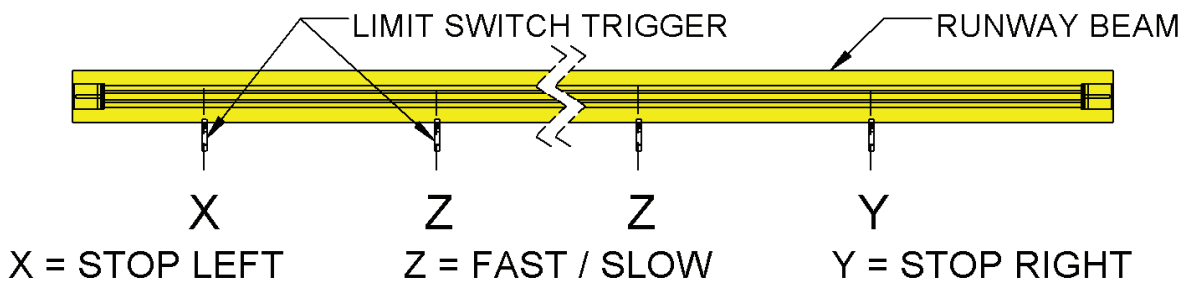
The trolley frame and bridge frame shall not be considered electrically grounded through the bridge and trolley wheels and its respective tracks. A fourth runway conductor and collector shall be provided for grounding.



## ⚠ WARNING

Verify that the crane is furnished for the same voltage, frequency and phase as the runway power supply. Crane voltage is shown on nameplate on bridge panel. Do not operate crane until "Start Up and Pre-Operational Inspection" are made.

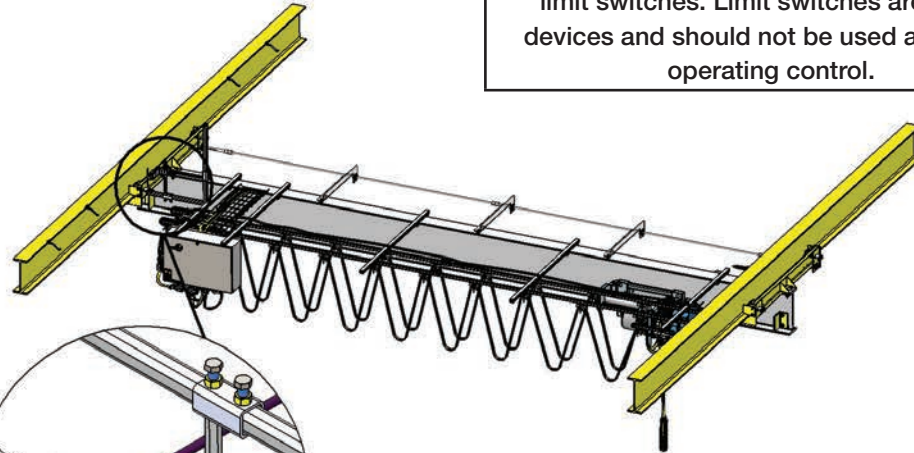
### TRAVEL LIMIT SWITCH TRIGGER MOUNTING LOCATION



# STEP 17: BRIDGE TRAVEL LIMIT SWITCH INSTALLATION

## ⚠ WARNING

Damage to the hoist, a dropped load, and injury may result if limit switches fail due to improper use. Under normal operating conditions, stop hoist travel before engaging limit switches. Limit switches are safety devices and should not be used as normal operating control.

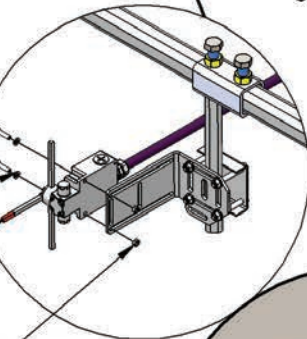


SOCKET HEAD SCREW

LOCK WASHER

TRAVEL LIMIT SWITCH

HEX NUT



## ⚠ WARNING

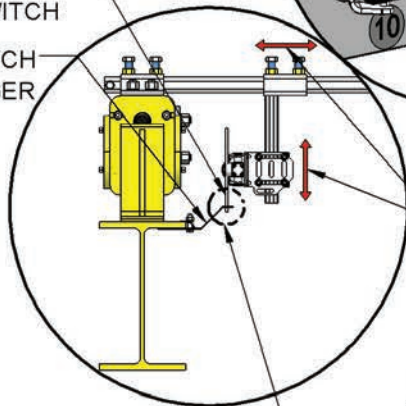
DO NOT UNPLUG CONNECTORS WHILE CIRCUIT IS ENERGIZED.

BEFORE PLUGGING IN CONNECTORS REMOVE POWER FROM SYSTEM.

TRAVEL LIMIT SWITCH

LIMIT SWITCH TRIGGER

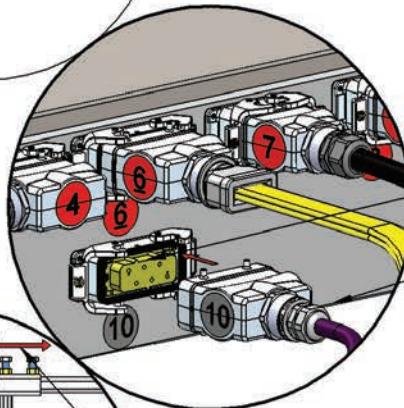
POSITION THE LIMIT SWITCH WITH RESPECT TO TRIGGER



ADJUST TOW ARM

AFTER INSERTING CABLE CONNECTORS ROTATE THE LATCHES BY HAND AND LOCK SECURELY

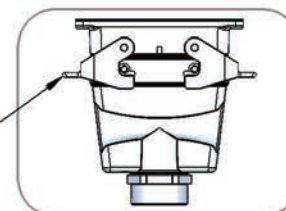
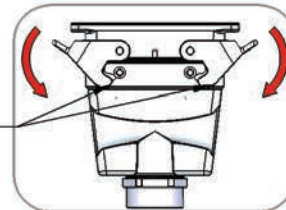
CONNECTOR LATCHES IN LOCKED CONDITION



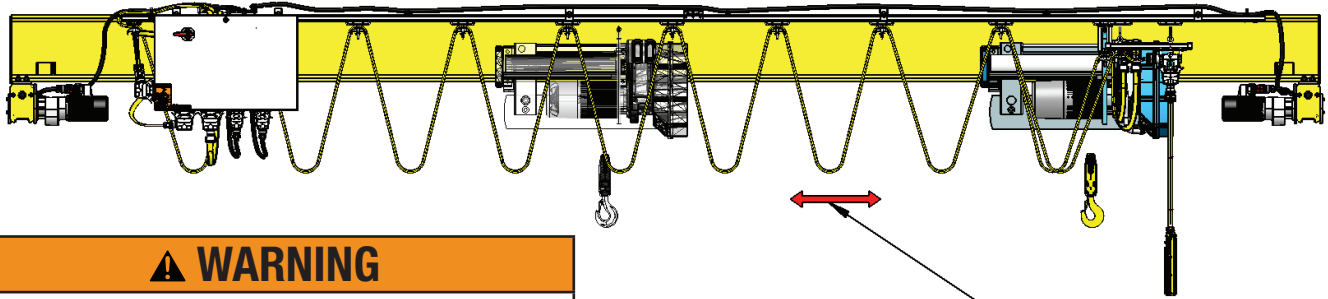
CONNECTOR #10  
6 PIN CONNECTION

BOTTOM SIDE OF BRIDGE PANEL

### LOCKING CONNECTORS



## STEP 18: FESTOON RUNWAY CHECKING



### **⚠ WARNING**

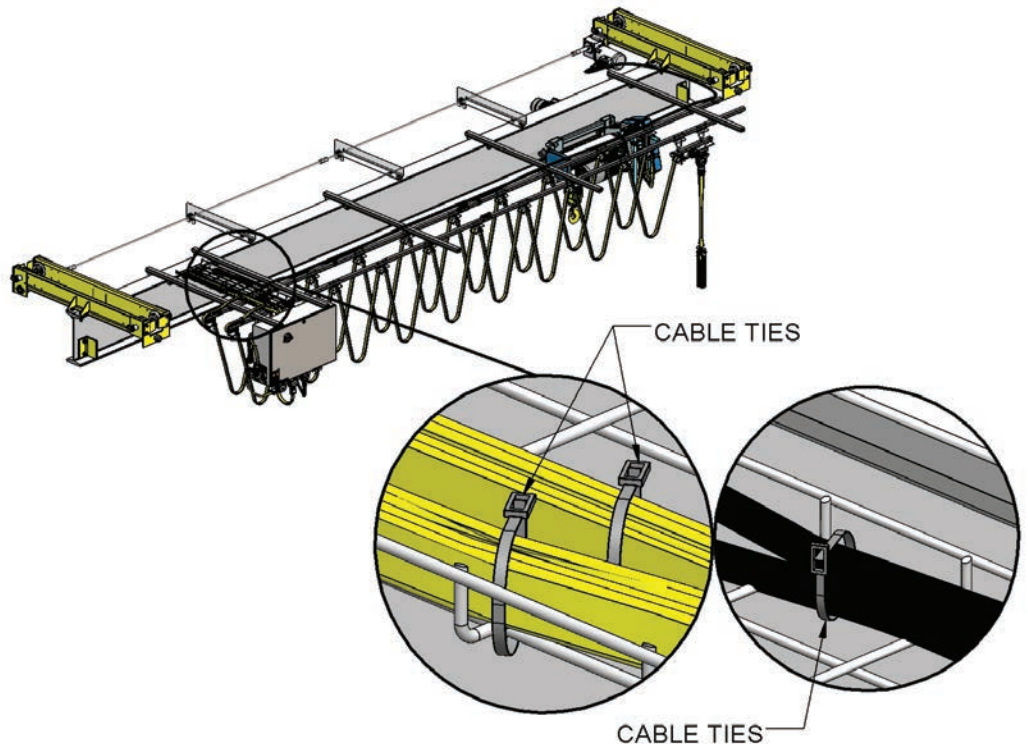
Make sure all **INSTALLATIONS AND START-UP INSPECTIONS** have been made in accordance with instructions furnished with the **HOIST and TROLLEY** before turning on the power.

SLOWLY RUN HOIST THROUGH ENTIRE LENGTH OF TRAVEL.  
CHECK FOR BINDING IN THE TOW TROLLEY OPENING OR  
OBSTRUCTION TO TOW ARM

### **⚠ WARNING**

Trolley stops (clip angles) or end stop assemblies must be installed on both ends of the bridge beam to prevent hoist trolley from running off the end of the beam, which could result in injury to the operator and others and damage to the load and other property.

## STEP 19: ADDING CABLE TIES

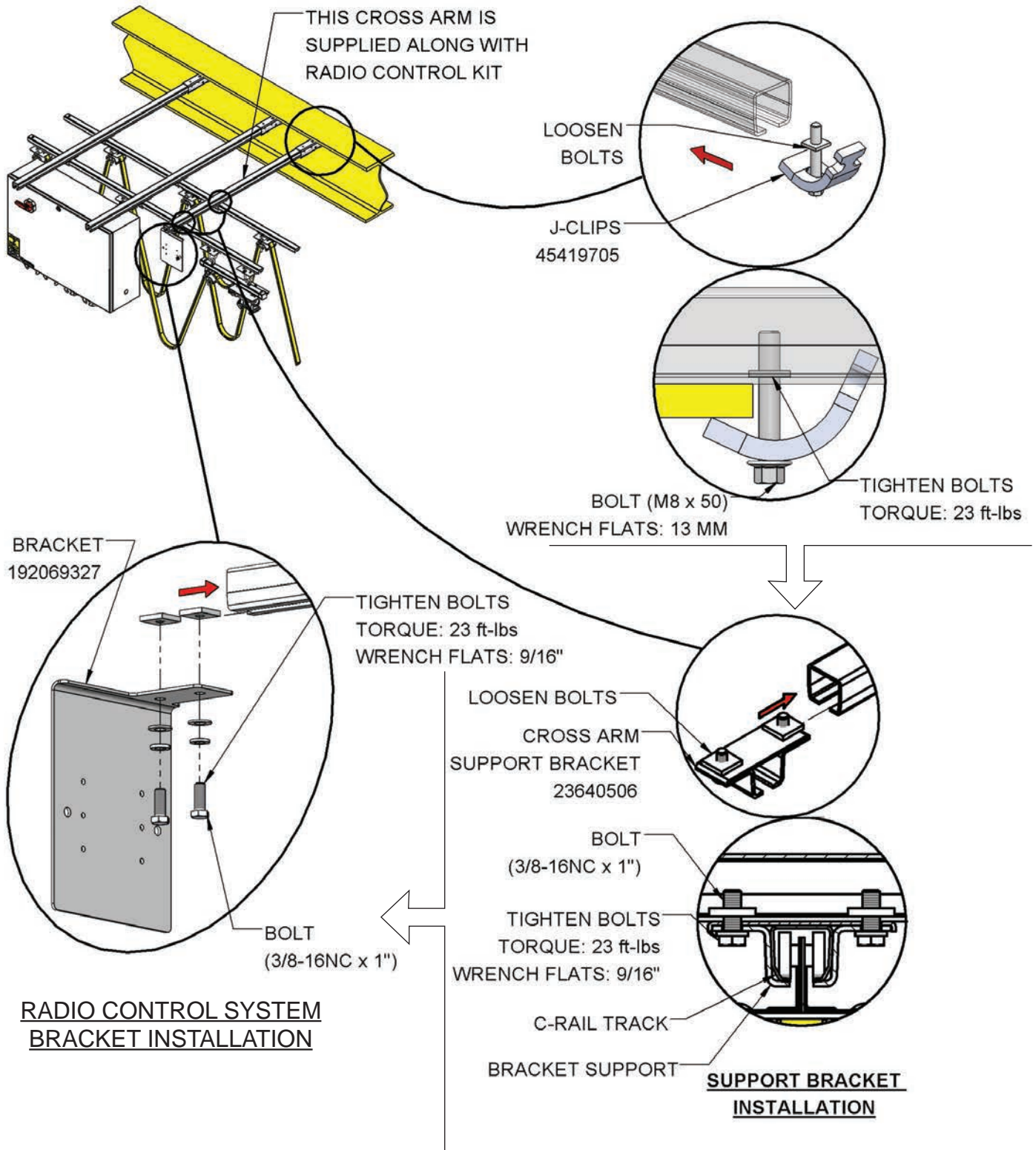


# CHAPTER 7

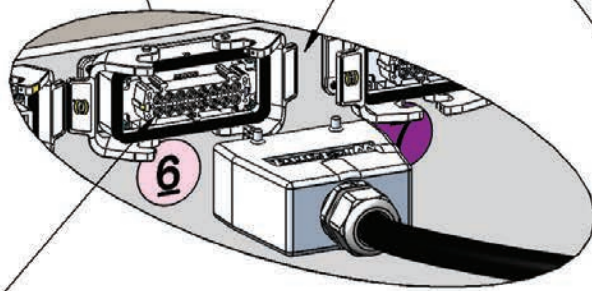
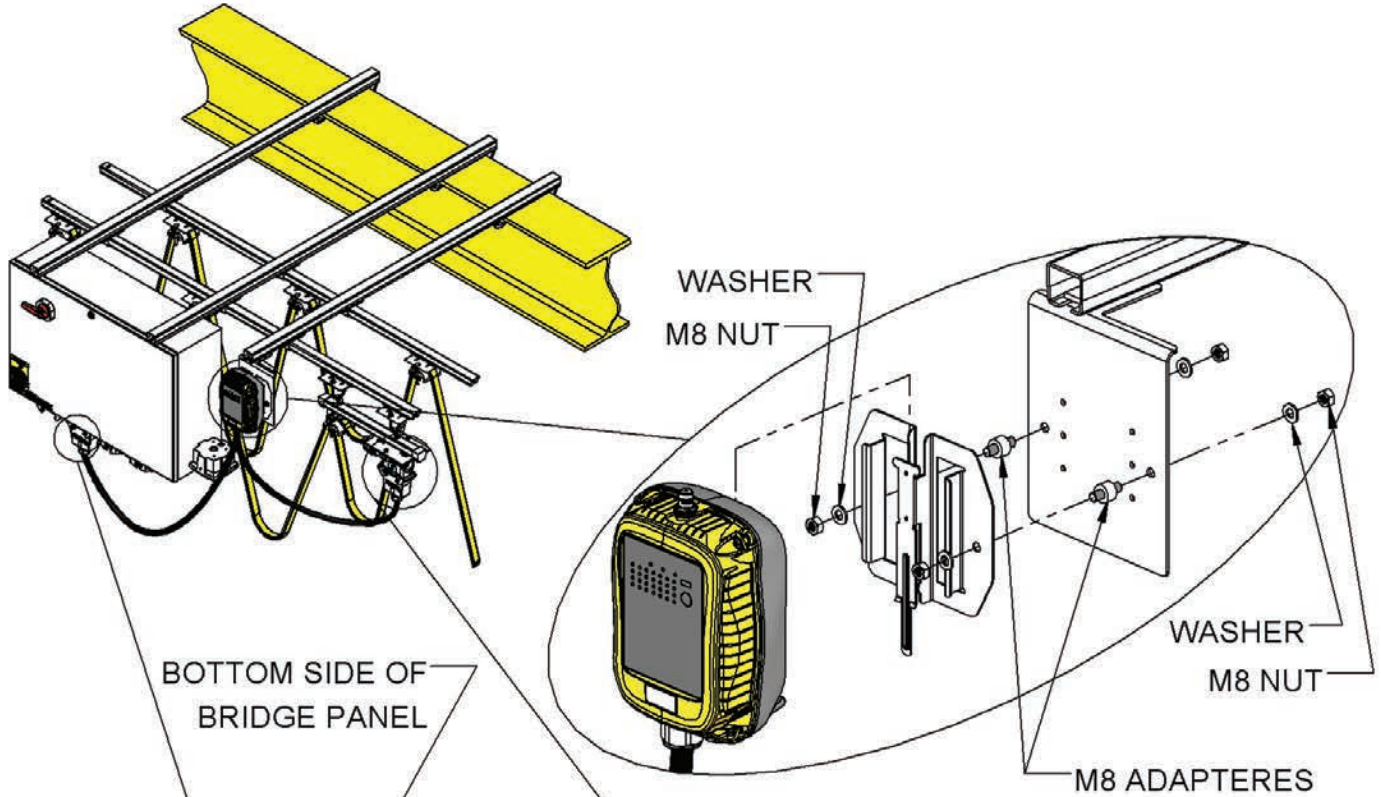
## RADIO CONTROL & HORN INSTALLATION FOR FESTOON SYSTEM



# STEP 1: CROSS ARM & BRACKET INSTALLATION FOR RADIO CONTROL



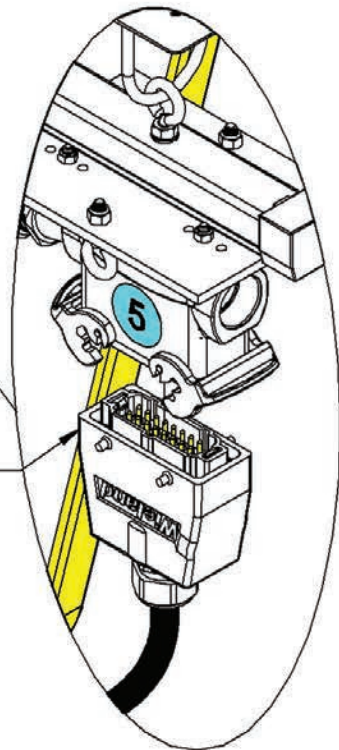
## STEP 2: RADIO CONTROL SYSTEM INSTALLATION



CONNECTORS #6  
16 PIN CONNECTION

### CONNECTION ON BRIDGE PANEL

CONNECTOR #5  
16 PIN CONNECTION



### CONNECTION ON FESTOON CONTROL TROLLEY (AS REQUIRED)

#### **⚠ WARNING**

DO NOT UNPLUG CONNECTORS WHILE CIRCUIT IS ENERGIZED.

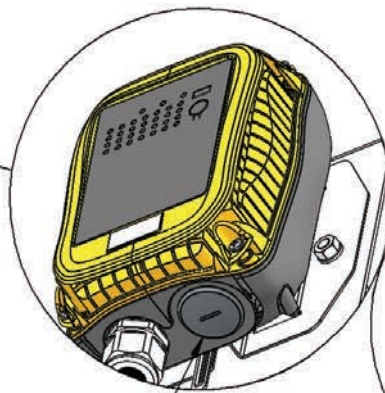
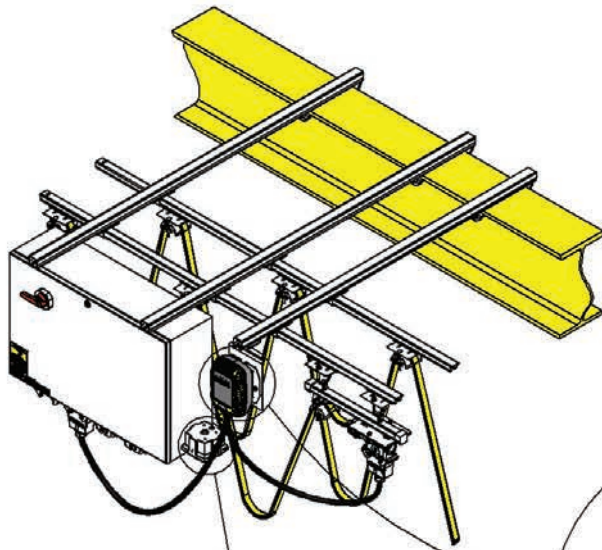
BEFORE PLUGGING IN CONNECTORS REMOVE POWER FROM SYSTEM.



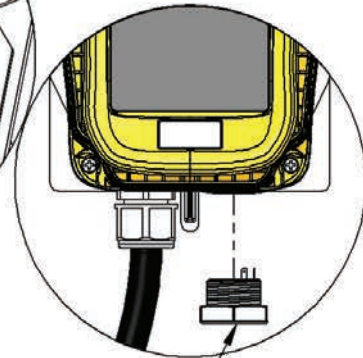
# STEP 3: HORN INSTALLATION (INTERNAL/EXTERNAL)

**⚠ DANGER**

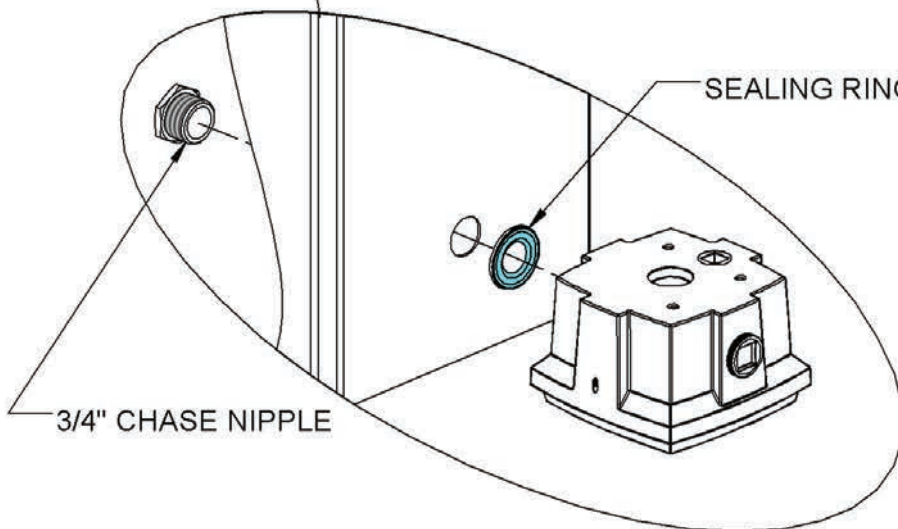
Disconnect power and lockout disconnecting means before installing internal or external horn.



REMOVE DUMMY PLUG



INSTALL RADIO CONTROL HORN



3/4" CHASE NIPPLE

SEALING RING FOR 3/4" NPT

**EXTERNAL HORN INSTALLATION**



# WARRANTY

## LIMITATION OF WARRANTIES, REMEDIES, AND DAMAGES

### INDEMNIFICATION AND SAFE OPERATION

Buyer shall comply with and require its employees to comply with directions set forth in instructions and manuals furnished by Seller and shall use and require its employees to follow such instructions and manuals and to use reasonable care in the use and maintenance of the Goods and any Replacement Parts. Buyer shall not remove or permit anyone to remove any warning or instruction signs on the Goods or Replacement Parts. In the event of personal injury or damage to property or business arising from the use of the Goods or Replacement Parts, Buyer shall within 48 hours thereafter give Seller written notice of such injury or damage. Buyer shall cooperate with Seller in investigating any such injury or damage and in the defense of any claims arising therefrom.

If Buyer fails to comply with this section or if any injury or damage is caused, in whole or in part, by Buyer's failure to comply with applicable federal or state laws, rules or regulations safety requirements, Buyer shall indemnify and hold Seller harmless against any claims, loss or expense for injury or damage arising from the use of the Goods and/or Replacement Parts.

### CMCO Warranty (HOISTS)

- A. Columbus McKinnon Corporation ("Seller") warrants to the original end-user ("Buyer") that, for a period of one (1) year from the date of Seller's delivery of the goods (collectively, the "Goods") to the carrier, the Goods will be free from defects in workmanship and materials... In addition, Seller warrants to Buyer that, for a period of one (1) year from the date of their delivery by Seller to the carrier, any aftermarket or replacement parts, accessories or components purchased by Buyer with respect to any Goods (collectively, "Replacement Parts") will be free from defects in workmanship and materials.
- B. IN THE EVENT OF ANY BREACH OF ANY SUCH WARRANTY, SELLER'S SOLE OBLIGATION SHALL BE EXCLUSIVELY LIMITED TO, AT THE OPTION OF SELLER, REPAIR OR REPLACEMENT, F.O.B. SELLER'S POINT OF SHIPMENT, OF ANY GOODS OR REPLACEMENT PARTS THAT SELLER DETERMINES TO HAVE BEEN DEFECTIVE OR, IF SELLER DETERMINES THAT SUCH REPAIR OR REPLACEMENT IS NOT FEASIBLE, TO A REFUND OF THE PURCHASE PRICE UPON RETURN OF THE OR REPLACEMENT PARTS TO SELLER. NO CLAIM AGAINST SELLER FOR ANY BREACH OF (i) SUCH WARRANTY WITH RESPECT TO THE ELECTRICAL COMPONENTS OF ANY GOOD OR ANY REPLACEMENT PARTS, SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE (1) YEAR FROM THE DATE OF SELLER'S DELIVERY TO THE CARRIER AND (ii) SUCH WARRANTY WITH RESPECT TO THE MECHANICAL COMPONENTS OF ANY GOOD SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE (1) YEAR FROM THE DATE ANY ALLEGED CLAIM ACCRUES. EXCEPT FOR THE WARRANTIES SET FORTH ABOVE, SELLER MAKES NO OTHER WARRANTIES WITH RESPECT TO THE GOODS OR ANY REPLACEMENT PARTS, WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUALITY AND/OR THOSE ARISING BY STATUTE OR OTHERWISE BY LAW OR FROM ANY COURSE OF DEALING OR USE OF TRADE, ALL OF WHICH ARE HEREBY EXPRESSLY DISCLAIMED.

- C. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER OR ANY THIRD PARTY WITH RESPECT TO ANY GOOD OR REPLACEMENT PART, WHETHER, IN CONTRACT, TORT OR OTHER THEORY OF LAW, FOR LOSS OF PROFITS OR LOSS OF USE, OR FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, DIRECT OR INDIRECT DAMAGES, HOWSOEVER CAUSED. SELLER'S MAXIMUM LIABILITY TO BUYER WITH RESPECT TO THE GOODS OR ANY REPLACEMENT PART SHALL IN NO EVENT EXCEED THE PRICE PAID BY BUYER FOR THE GOODS OR REPLACEMENT PART THAT ARE THE SUBJECT OF THE APPLICABLE CLAIM.
- D. Seller shall not be liable for any damage, injury or loss arising out of the use of the Goods or any Replacement Part if, prior to such damage, injury or loss, such Goods or Replacement Parts are: (1) damaged or misused following Seller's delivery to the carrier; (2) not maintained, inspected, or used in compliance with applicable law and Seller's written instructions and recommendations; or (3) installed, repaired, altered or modified (a) with any part or accessory other than those supplied by Seller or (b) without compliance with such laws, instructions or recommendations.
- E. This warranty is limited and provided only to the original end-user. Each Good and Replacement Part must be registered within sixty (60) days of receipt of each product to establish eligibility. Please register at [www.cmworks.com/hoist-warranty-registration](http://www.cmworks.com/hoist-warranty-registration) or submit a registration card via US mail.
- F. Any action against Seller for breach of warranty, negligence or otherwise in connection with the electrical components of any Good must be commenced by Buyer within one (1) year after (a) the date any alleged claim accrues; or (b) the date of delivery of the Goods to Buyer, whichever is earlier. Any action against Seller for breach of warranty, negligence or otherwise in connection with the mechanical components of any Good must be commenced by Buyer within one (1) year after the date any alleged claim accrues... Any action against Seller for breach of warranty, negligence or otherwise in connection with any Replacement Part must be commenced by Buyer within one (1) year after (y) the date any alleged claim accrues; or (z) the date of delivery of the Replacement Part to Buyer, whichever is earlier.
- G. This warranty is contingent upon Buyer's proper maintenance and care of the Goods and/or Replacement Parts, and does not extend to normal wear and tear. Seller reserves the right, at its option, to void this warranty in the event of Buyer's use with the Goods and/or Replacement Parts of parts or accessories other than those supplied by Seller.

### **⚠ WARNING**

**Alterations or modifications of equipment and use of non-seller replacement parts can lead to dangerous operation and injury.**

#### **TO AVOID INJURY:**

- Do not alter or modify equipment.
- Do use only replacement manufactured by seller.



FAMILY OF BRANDS



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