



PREFACE

Thank you for selecting TC/American's Spanmaster® Work Station Crane for your specific material handling requirements. All Spanmaster® Work Station Cranes have been designed to ensure smooth operation and reliable performance. All Work Station Cranes meet MMA MH27.2 and ASME/ANSI B30.11 specifications. Work Station support stands meet the requirements for A.I.S.C.-ASD (American Institute of Steel Construction-Allowable Stress Design). By following the procedures outlined in this manual, you will have many years of dependable service from your Spanmaster® Work Station Crane.

CAUTION

1. TC/American assumes no responsibility for the strength or levelness of the floor surface. A minimum of a 6"-thick reinforced concrete floor is recommended.
2. Spanmaster® Work Station Cranes are not designed for lifting, supporting, or transporting humans.
3. TC/American recommends a minimum of 2" clearance between the top of the support stand and building utilities.

Before proceeding with assembly and installation, read all instructions outlined in this manual.



INSTALLATION PROCEDURES

A. Pre-Installation Instructions

Enclosed with each Spanmaster® Free Standing Crane Kit is:

1. Installation and operation manual
2. Crane Assembly Drawings

RECOMMENDATION

- Check the packing slip for the correct quantities of parts.
- Keep Installation Manual, Crane Assembly Drawing, and any other materials filed together in a safe place.

TC/American's Spanmaster® Free Standing Crane Kits **do not** include the following items which must be furnished by others:

- Hoist (with top hook suspension)
- Anchor bolts (four (4) 3/4" bolts per column)
- Metal shims, grouting plate or grout for columns
- Sway bracing

NOTE:

1. Consult a qualified structural engineer for the proper type 3/4" anchor bolts.
2. Allow enough length of concrete anchor bolts above the floor line for the baseplate, flat washer, lock washer, nuts, shims and grout if used.



B. Support Stand & Header Installation

Each runway support stand consists of two columns, a header beam, and connection hardware.

RECOMMENDATION

These assembly instructions assume that each component of the support stand will be individually erected. However, if there is enough open floor space and proper lift equipment is available, the columns and header may be assembled lying flat on the floor then lifted into place as an assembly.

Support Stand & Header Assembly Instructions

1. Clear area of any unnecessary pieces of equipment.
2. Using the provided general arrangement drawing, use a chalk line or other marking method, layout the exact position of the columns, and anchor bolt locations on the floor.
3. Position two columns that will support a header into place.

Note: Be sure the column is orientated correctly. Column webs will be perpendicular to the header beam.

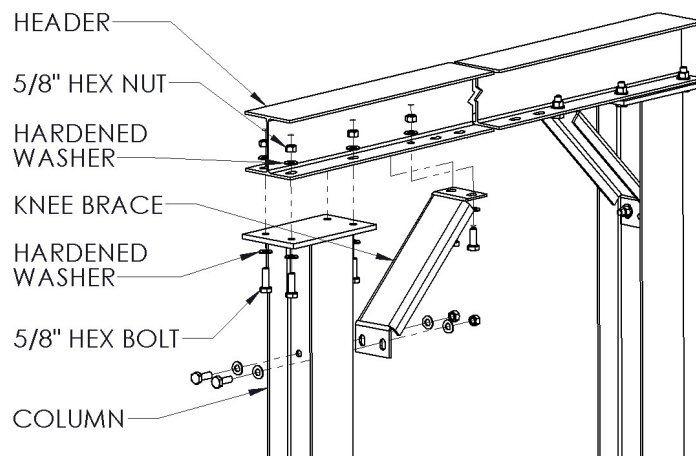


Figure 1: Header Assembly to Columns



4. Install concrete anchor bolts and hardware to the manufacturer's specifications. To prevent the columns from falling, securely support them until the anchor bolts are installed.
5. Lift a header into place, spanning between the columns. Align the holes in the column cap plates to the holes in the header.
6. Assemble the header to each column using 5/8" bolts, flat washers, heavy hex nuts. (See figure 1).
7. Tighten 5/8" bolts. (See page 14 for torque values)
8. Install the remaining Work Station columns and header beams (repeat steps 3 through 7).
9. Plumb and level the work station columns and headers using steel shims (not included) under the columns base plates. Taking care to keep each column plumb and the tops of all columns at the same elevation. Tighten the concrete anchor bolts per manufactures specifications.
10. Install knee braces at each column to the header connection.

C. Crane Runway Installation

Each crane runway assembly consists of two wide flange runway beams, securing hardware, end stops, and splice joint assemblies (if required).

CAUTION

DO NOT torque bolts on the runway until the entire runway track has been aligned

Crane Runway Assembly Instructions

1. Reference included general arrangement drawing to identify proper runway locations.
2. Lift runway into position and attach the runway beam to the header using 5/8" bolts, flat washers, and hex nuts. (See figure 2)
3. Snug 5/8" hardware to secure the runway to the header.
4. Repeat steps one and two to install additional runway beams as needed.

5. After all runway beams have been hung, confirm the runways are level and parallel (Reference figure page 15)
6. After completing step 4 torque all 5/8" hardware to securing runway beams to headers to 160 ft/lb. (See torque values on page 14)
7. Install bolted splice as needed per figures 3a and 3b tighten bolts to 20 ft/ lb.
8. Install end stops on all four ends of the runway (see figures 4a & 4b).

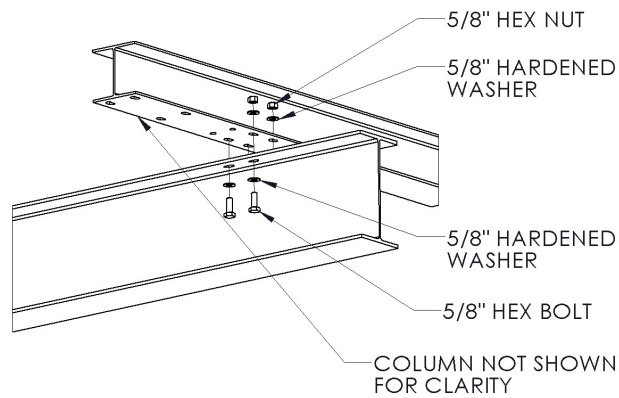


Figure 2: Runway to header connection

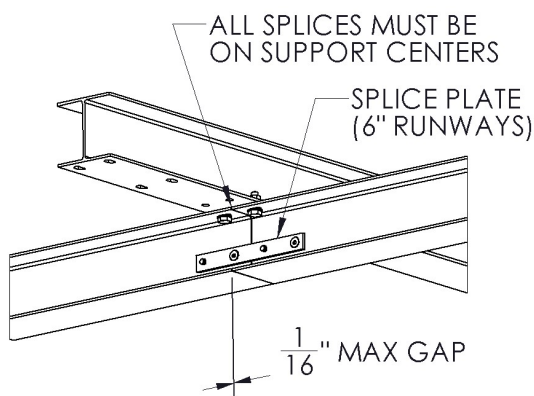


Figure 3a: Splice Assembly 6" Runway Beams
Splice uses 1/2" hardware

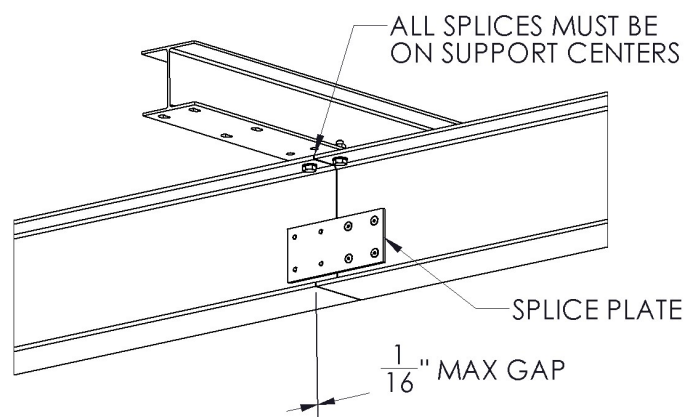


Figure 3b: Splice Assembly Runway Beams > 6"
Splice uses 3/8" hardware

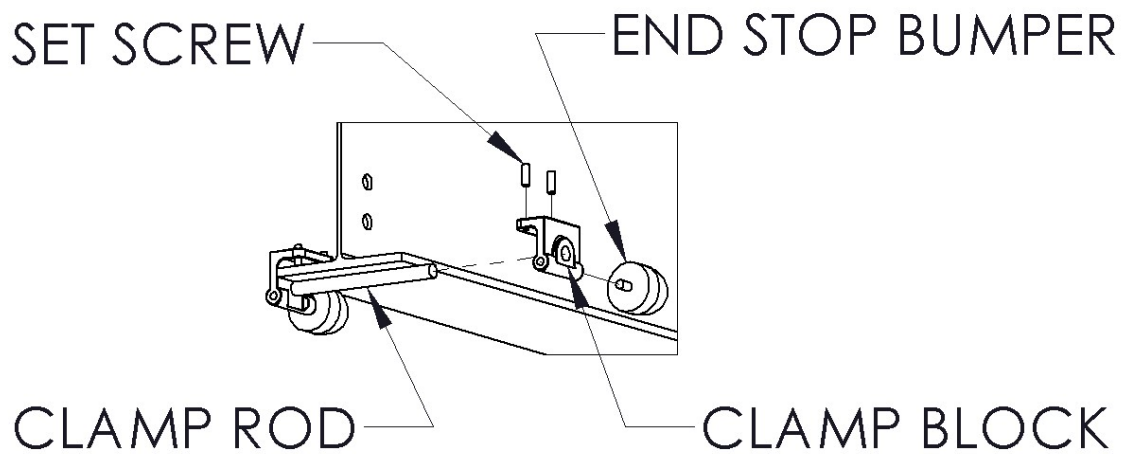


Figure 4a: Standard End Stop

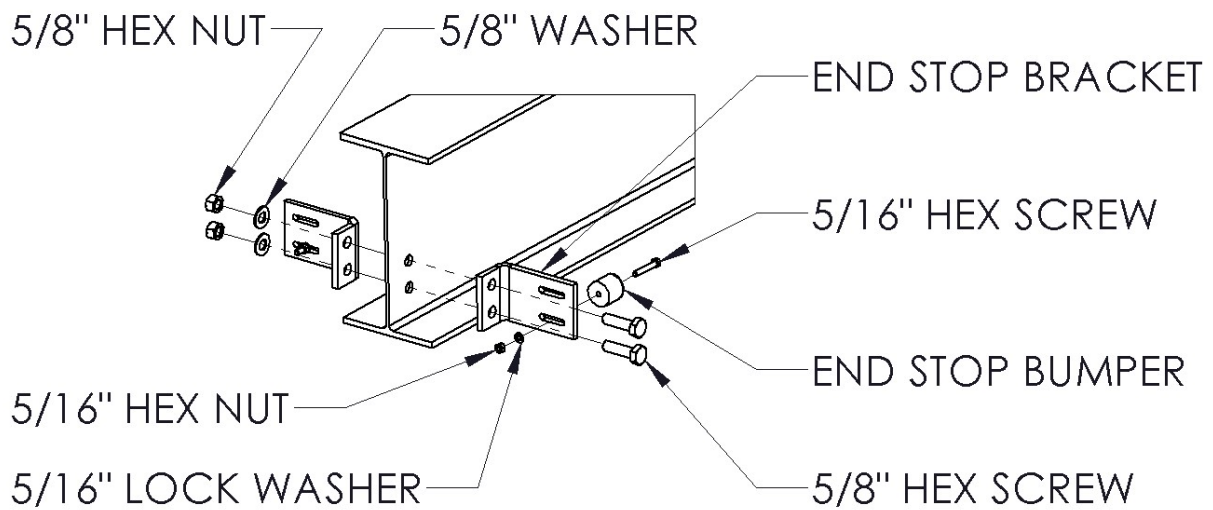


Figure 4b: Festoon End Stop

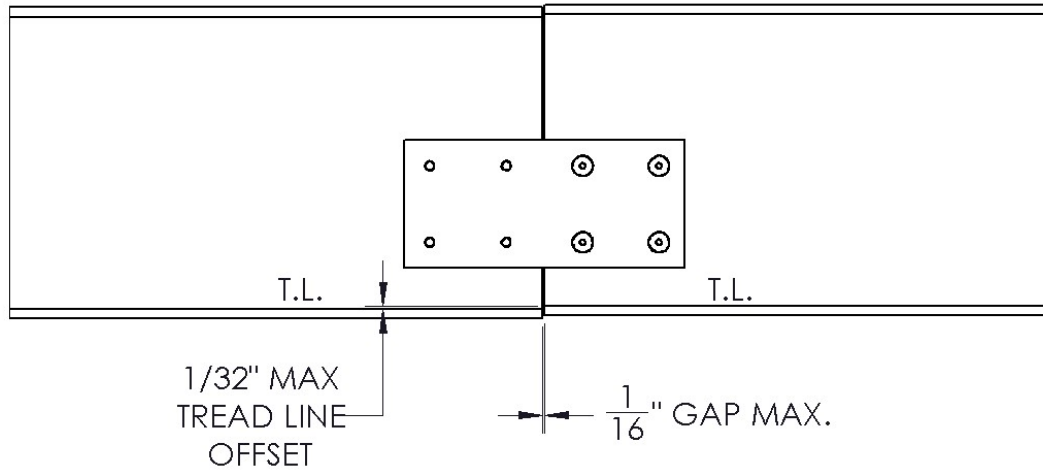


Figure 5: Runway Alignment

8. To align runway rail for smooth operation. Maximum misalignment at T.L. (treadline) should not exceed 1/32" vertical & horizontal (see figure 5). If misalignment is greater than 1/32" use grinder to feather joint until you have a smooth transition.

D. Crane & End Truck Installation

Each crane & end truck assemblies consist of one crane girder, two end trucks, end stops, and hoist trolley.

Bridge Assembly Instructions for 250 lb - 4,400 lb. capacity Spanmaster® workstation cranes.

Caution shall always be taken when assembling components as pinch points can be encountered

1. For assembly of 250 lb. – 2200 lb. capacity bridge assembly refer to figure 5a for 4000 – 4400 lb. capacity refer to figure 5b
2. Install U hanger assembly to the bridge per the included bridge assembly lightly lock the hex head set screws (see figure 5a)

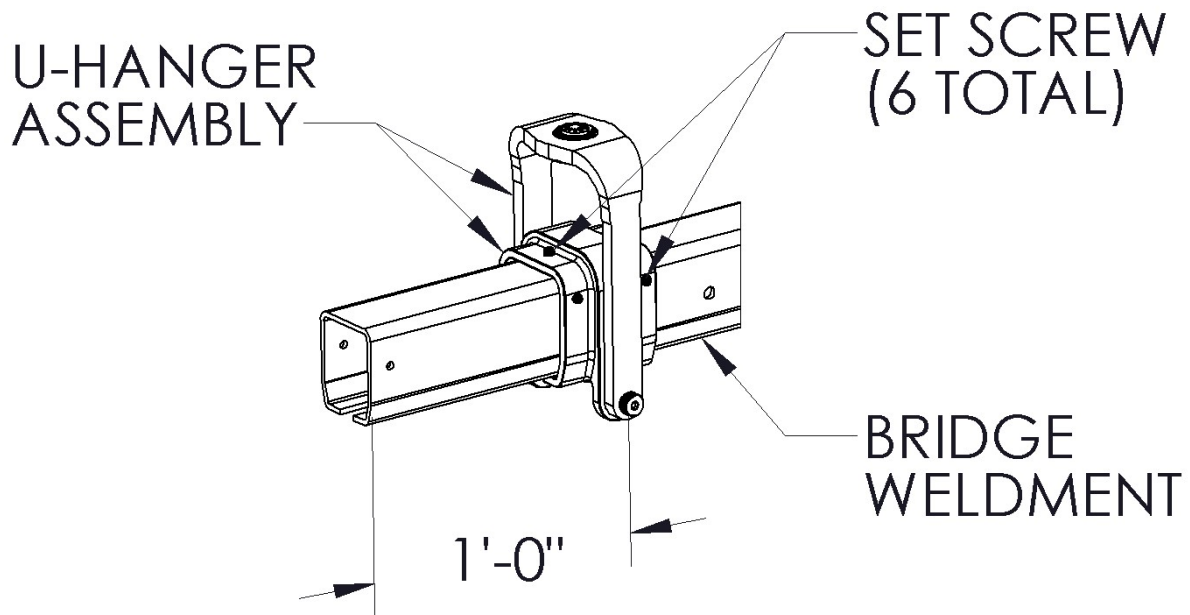


Figure 5a: 250 lb – 2200 lb U-hanger connection

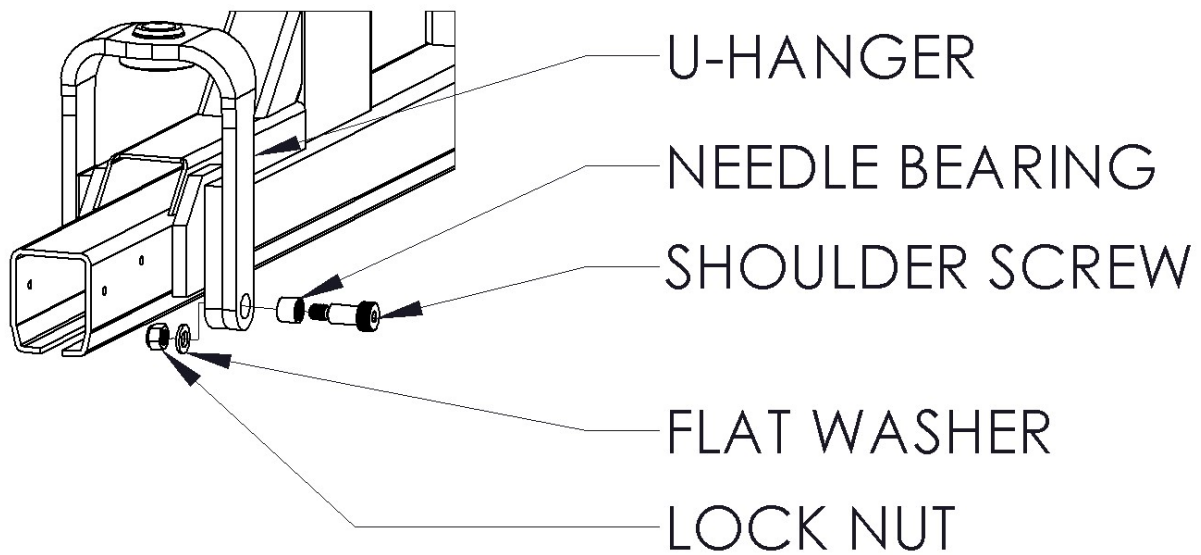


Figure 5b: 4000 lb. – 4400 lb. U-hanger connection

END TRUCKS

Note when fitting spacers allow for crush. When torqued, allow 1/8" clearance from the side guide roller to the side of the runway beam. - The side roller guide bearing axles are offset to allow for minor adjustment

3. Install spacers to one end of the axle Items 13 & 14 per figure ETSM-20 on page 16 to allow the pivot to be central then Install the end truck side plate, Install nut Item 15 and tension.
4. Lightly grease the pivot post bearing item 3 with grease provided
5. Lift the bridge into place pass the side plate with the axle attached through the U hanger fit the other spacers or one less as required to the opposite end of the axle then install the side plate. (Figure 6)
6. Install the lock nut Item 15

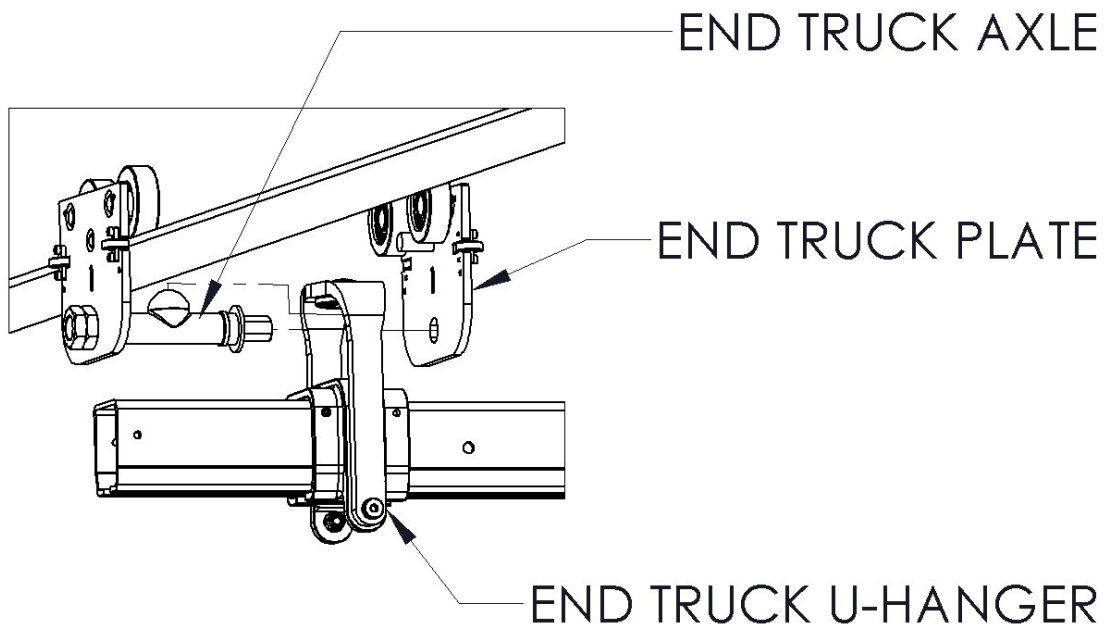


Figure 6: U-Hanger to End Truck Connection



7. Torquing of axle nuts

Nut torque is very important – Please note that the side plate will rotate while the nut is being turned, if not restrained.

NOTE - Two methods can be used to tighten the nuts

8. Method One

- a. Apply about 30% of the nut torque, then using the hoist and weight apply a minimum load of 75% of the crane capacity to seat the crane side plate wheels to the rail.
- b. Tighten the nut to the specified torque.
- c. By turning the wheels ensure all wheels are seated on the track if the side plate has moved while being torqued either apply more load (before final torque) or place a block of wood against the side plate, using a hammer hit the top vertical face of the side plate to bring all the wheels into equal contact with the runway beams. Ensure nut torque is not released.
- d. Install and torque the remaining lock nuts.
- e. Recheck to ensure all wheels are on the running surface.

9. Method Two

- a. Apply the specified torque to the axle nuts, using a block of wood and a hammer hit the top vertical face of the side plate to align the wheels; all wheels shall be touching the long travel rail surface.
- b. Install and torque the remaining lock nuts.
- c. Recheck to ensure all wheels are on the running surface.

Half nut torque values

4000 – 4400 lb. capacity	36mm half nut 315 ft-lb.
2000 – 2200 lb. capacity	30mm half nut 180 ft-lb.
1000 – 1100 lb. capacity	24mm half nut 90 ft-lb.
500 – 550 lb. capacity	20mm half nut 55 ft-lb.
200 – 275 lb. capacity	16mm half nut 27 ft-lb.

10. Check the side clearance over the entire runway length to ensure there is no binding of the end truck. The side guide roller has an offset axle to allow for a minor adjustment.

11. Adjust the U hanger to cross travel mounting brackets (item 1 on page 16) so they are in a vertical plane when the bridge is at 90 degrees to the runway beams, reference the included bridge assembly drawing to verify the proper location. Tighten the hex head set screws item 21 on page 16. The cross beam support bracket has 6 internal hex locking screws, *the 6 screws on the bracket can be secured with a thread locking compound if required.* **STEP 11** is not necessary for 4000 and 4400 lb. capacity bridges because the U hanger mounting brackets are welded components to the bridge removing the necessity to adjust the end bracket.
12. Install one bridge end stop. See figures 7a and 7b.

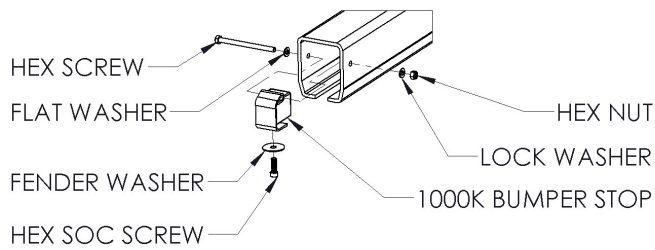


Figure 7a: Bridge End Stop

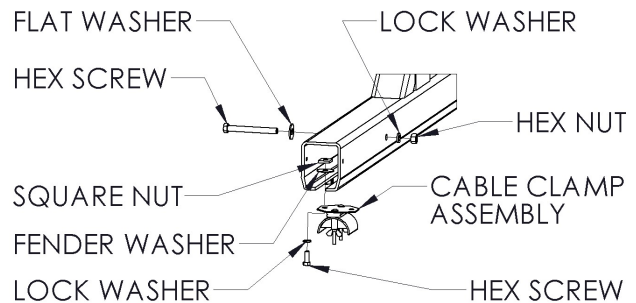


Figure 7b: Bridge End Stop Festoon Side

13. On the end currently without an end stop insert the hoist trolley see figure 8
14. If the system has a festoon system, skip ahead to Section E for festoon installation instructions before completing the remaining step in this section.
15. Remove trolley bolt and install hoist (see figure HTSM-20 on page 18). Hoists should have a rigid (non-swiveling) top hook to prevent twisting or over-straining of the electrical cable or air hose.
16. Install the second end stop on the bridge.

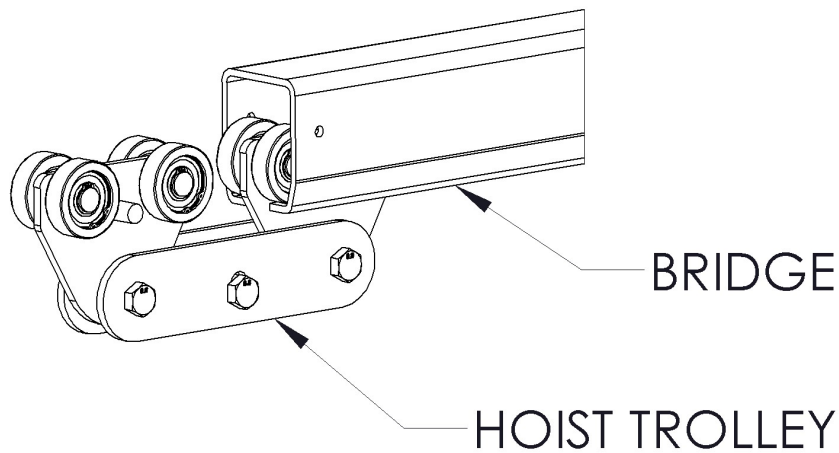


Figure 8: Hoist Trolley

CAUTION

Do not over tighten trolley bolts. Assembly must be able to move freely to allow for equal wheel loading. See figure HTSM-20 on page 18.

E. Festoon Systems

1. Assemble runway festoon trolleys to fit system runway flange width (see figure 9)
2. Reference festoon assembly drawing provided and install the required runway festoon trolley(s) on runway beam per the location shown on the provided system general arrangement drawing.
3. Install festoon end clamp on runway beam (see figure 11)
4. Reference festoon assembly drawing and install the required number of bridge festoon slider(s) on bridge per location shown on general arrangement drawing.
5. Install festoon end clamp on bridge(s) (see figure 7b)
6. Secure festoon cable carriers to the flat cable at the interval needed to provide the specified loop depth on the general arrangement drawing. For example, if 36" loop depth is required carriers should be secured every 6'
7. Suspend the festoon cable carriers from the runway festoon trolleys and festoon sliders then secure with the included retaining pin(s) (see figure 10)

8. Adjust the flat cable as necessary to ensure free movement along bridge and runway then secure the flat cable to bridge and runway end-clamps - Be careful not to over tighten the clamp; doing so may cause damage to the electric cable.
9. Stretch system to its full travel extents to verify proper operation before connecting to building power.
10. Make connections to the mainline power. Connection to mainline power and the installation of the electrical disconnect is to be performed by a qualified person or a licensed electrician.

WARNING

Crane cannot be utilized as a ground: A separate ground wire is required.

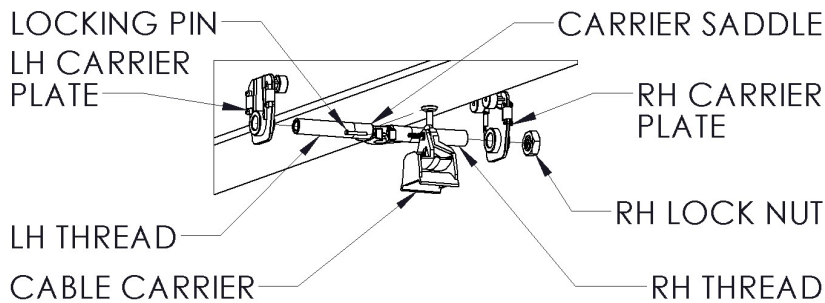


Figure 9: Runway festoon trolley

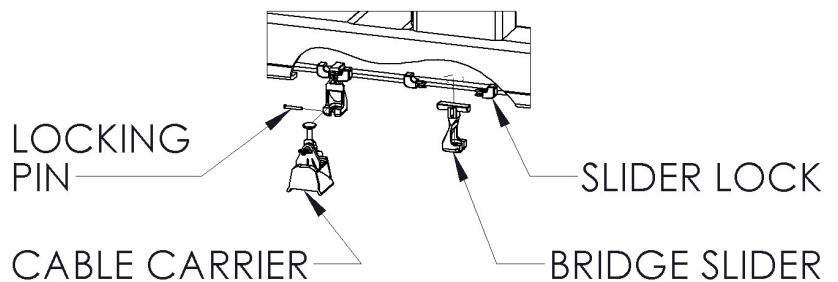


Figure 10: Bridge festoon sliders

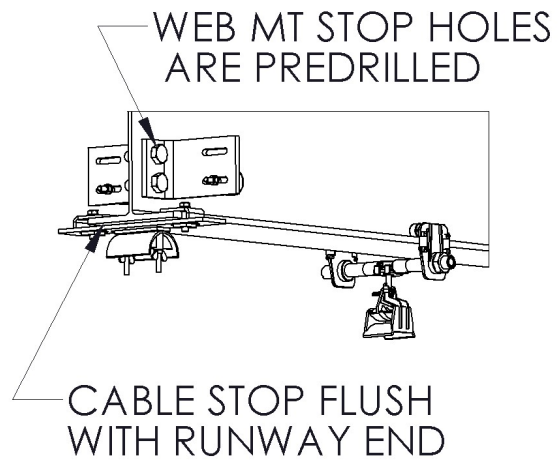


Figure 11: Runway festoon end clamp

F. Sway Bracing Instructions (bracing by others)

Spanmaster® freestanding workstation cranes have been engineered to operate without the need for additional bracing; however if based on your specific application it is determined that bracing is needed, please contact your local dealer or the factory for assistance with brace locations.

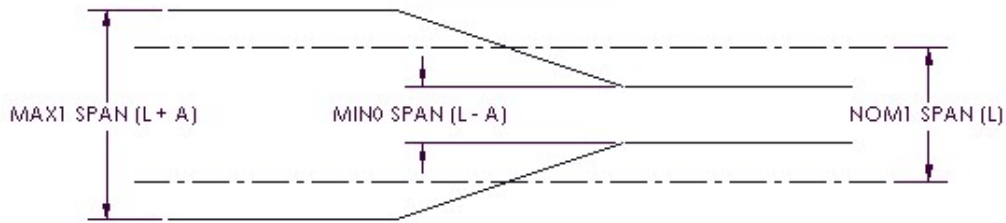
If bracing, always consult with a qualified structural engineer to determine if the building structure is adequate

SUGGESTED DRY TORQUE RATINGS

FASTNER DRY TORQUE RATINGS

3/8"	20 ft-lb.
1/2"	75 ft-lb.
5/8"	160 ft-lb.
3/4"	250 ft-lb.

SPAN (2 RUNWAYS)



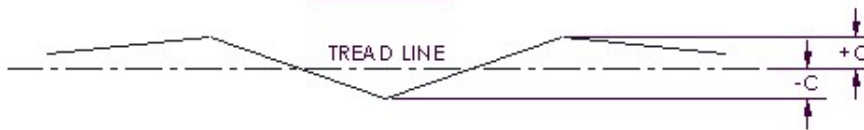
A = 3/16" MAX IN ANY SUPPORT SPAN
MAX RATE OF CHANGE = 1/4":20FT

STRAIGHTNESS



B = 1/4" MAX IN ANY SUPPORT SPAN
MAX RATE OF CHANGE = 1/4":20FT

ELEVATION



C = 1/4" MAX IN ANY SUPPORT SPAN
MAX RATE OF CHANGE = 1/4":20FT

CRANE RUNWAY TREAD TO TREAD ELEVATION

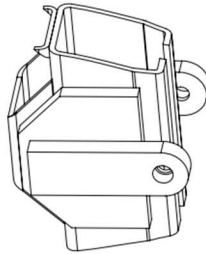


D = 3/16" MAX IN ANY SUPPORT SPAN
MAX RATE OF CHANGE = 1/4":20FT

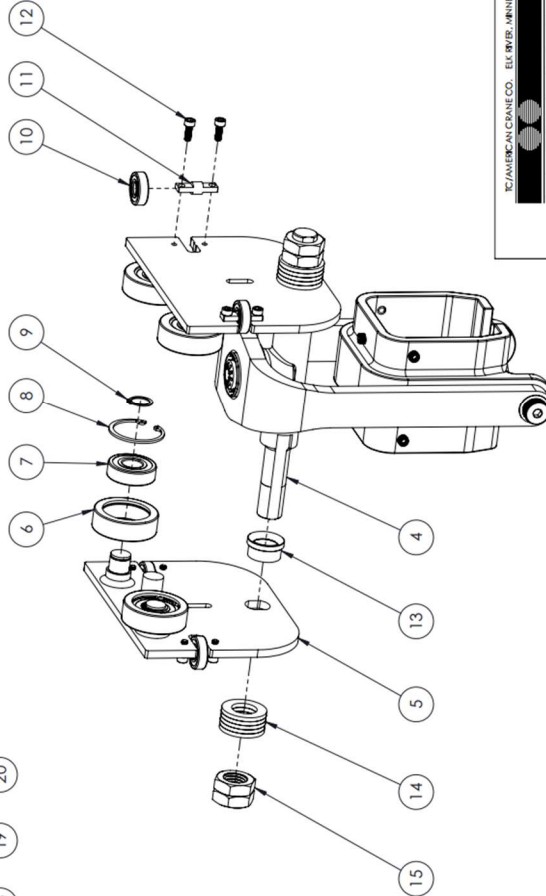
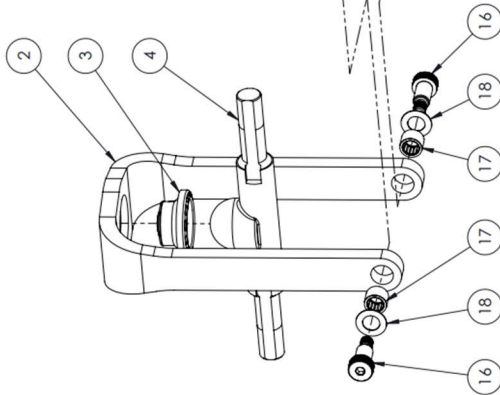
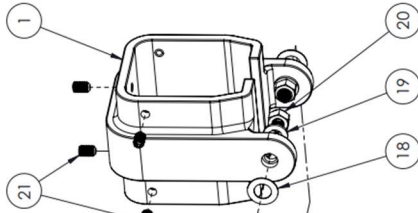
TC / AMERICAN

ITEM	QTY.	DESCRIPTION
1	1	CROSS BEAM SUPPORT
2	1	U-HANGER
3	1	PIVOT BUSHING
4	1	AXLE (WITH PIVOT POST)
5	2	SIDE PLATE
6	4	WHEEL BEARING
7	4	WHEEL SNAP RING
8	4	AXLE SNAP RING
9	4	GUIDE BEARING
10	4	LATERAL GUIDE ROLLER AXLE
11	4	SOCKET HEAD CAP SCREW
12	8	INTERNAL SPACER/WASHER SET
13	2	EXTERNAL SPACER/WASHER SET
14	10	LOCKNUT & NUT
15	4	SHOULDER SCREW
16	2	NEEDLE ROLLER BEARING
17	2	SHIM WASHER
18	4	WASHER
19	2	LOCKNUT
20	2	LOCKNUT
21	6	SET SCREW

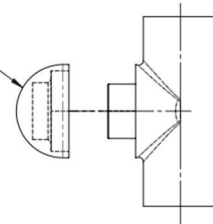
4000 - 4400#
BRIDGE CAP.
(NO ITEM #1, DIRECT
BOLT TO BRIDGE)



250 - 2200#
BRIDGE CAP.



PIVOT POST MAY BE A SEPARATE
PART AS SHOWN OR MACHINED
INTO THE AXLE CASTING.



ITEM #4
SCALE 1:2

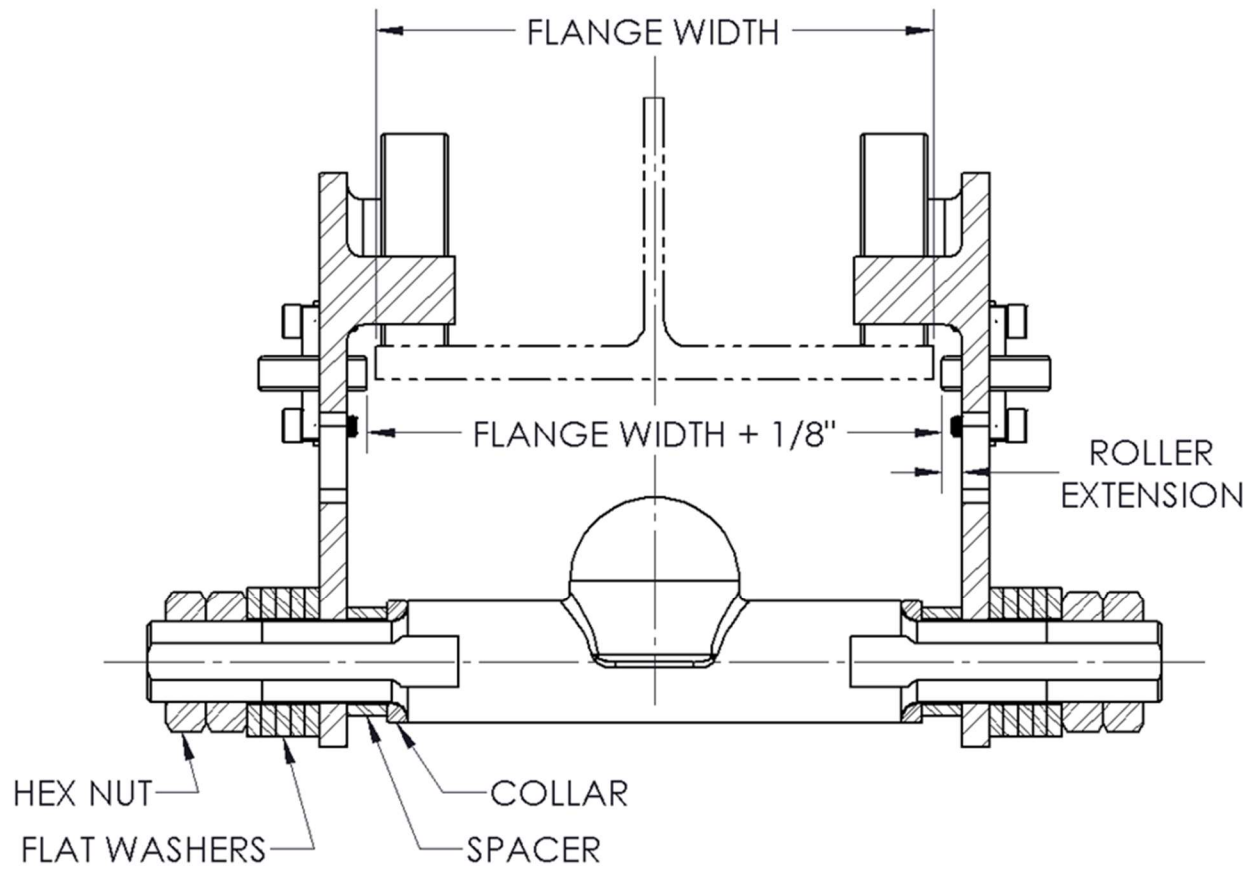
REF. DIMS. NO. 10
TOLERANCES UNLESS SPECIFIED:
MACHINED .XXX ± .005"
FRACTIONS .XX ± .01"
ANGULAR ± .3°
HOLE TO RECESS RECEIVING BUSHING AND/OR INTERNAL SPACER/WASHER SETS: .005"
HOLE TO RECESS RECEIVING NEEDLE ROLLER BEARING: .005"
HOLE TO RECESS RECEIVING LATERAL GUIDE ROLLER AXLE: .005"
HOLE TO RECESS RECEIVING WHEEL BEARING: .005"
HOLE TO RECESS RECEIVING WHEEL SNAP RING: .005"
HOLE TO RECESS RECEIVING AXLE SNAP RING: .005"
HOLE TO RECESS RECEIVING GUIDE BEARING: .005"
HOLE TO RECESS RECEIVING SHOULDER SCREW: .005"
HOLE TO RECESS RECEIVING LOCKNUT & NUT: .005"
HOLE TO RECESS RECEIVING WASHER: .005"
HOLE TO RECESS RECEIVING LOCKNUT: .005"
HOLE TO RECESS RECEIVING SET SCREW: .005"
TC/AMERICAN CRANE CO. IS NOT RESPONSIBLE FOR STRENGTH OF BEARING ASSEMBLY SHOWN BY OTHERS.



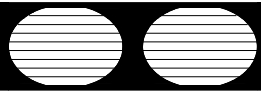
TC/AMERICAN CRANE CO. ELA. HWY. MINNEAPOLIS, MN 55300

ITEM: END TRUCK ASSEMBLY - SPANMASTER
DRAWN BY: B. HUNT
RELEASED BY: DH
DATE: 11-24-20
SCALE: NONE
WGT: - LB
SHEET 1 OF 1
REV: 3
A

FOR CHANGES
ORIGINAL RELEASE
DATE: 11-24-20
REV. DATE: 11-24-20
REV. DATE: 11-24-20

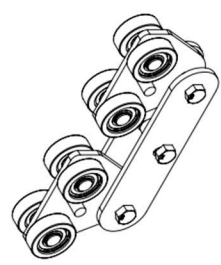
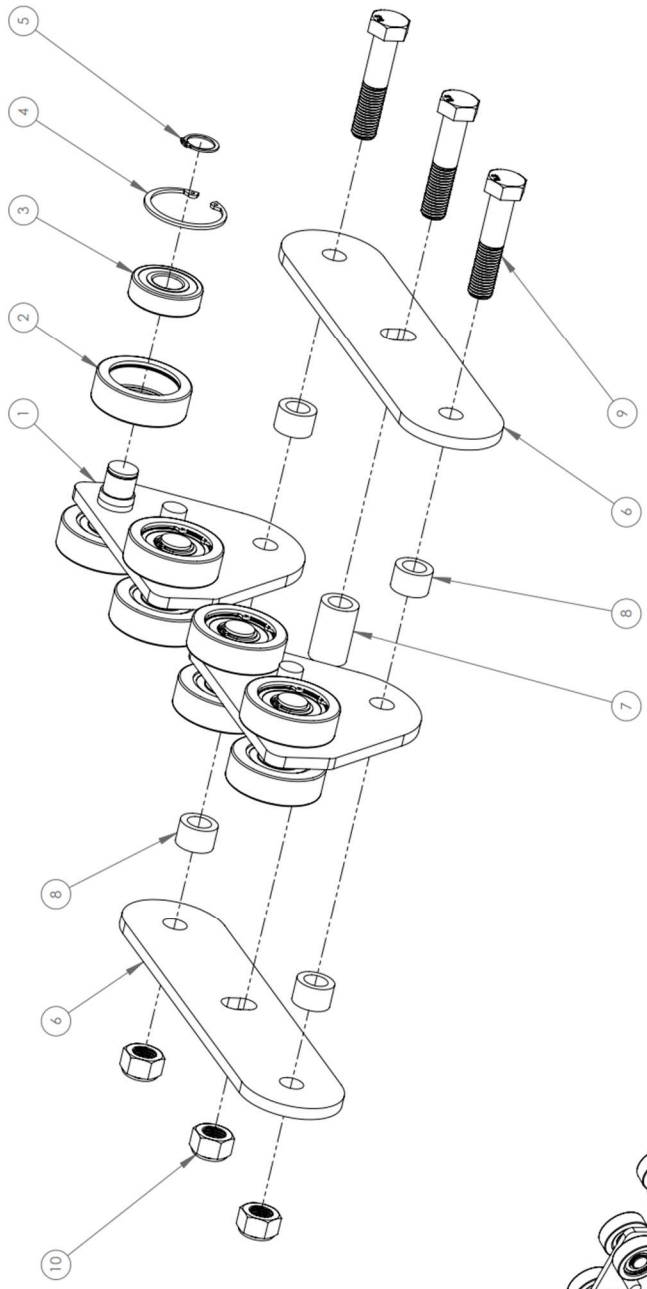
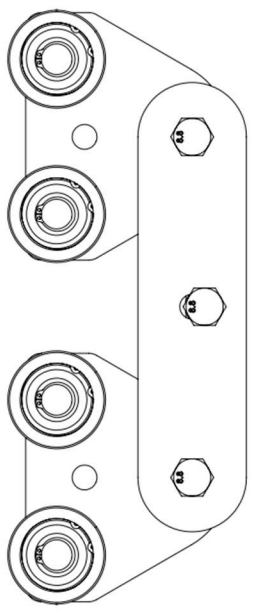


The axle assembly comes with an assortment of spacers and flat washers. Use these and additional washers if necessary to set the end truck width.



TC AMERICAN

ITEM	DESCRIPTION
1	TROLLEY PLATE
2	WHEEL
3	WHEEL BEARING
4	WHEEL SNAP RING
5	AXLE SNAP RING
6	LOAD BAR
7	HOIST SPACER
8	TROLLEY SPACER
9	HEX SCREW
10	LOCK NUT



TOLERANCES UNLESS SPECIFIED
 MACHINED .XXX ± .005"
 FRACTIONS .XX ± .01"
 ANGULAR ± 1°
 HOLE TO FIT BOLTS REFER TO THE DRAWING AND/OR TECHNICAL INFORMATION FOR TOLERANCE CLASSIFICATION.
 IN COMPLIANCE WITH THE ASME Y14.5M-2018 DIMENSIONAL PRACTICES AND STANDARDS, THIS DRAWING IS TO BE USED TO MANUFACTURE THE PARTS.
 TC AMERICAN CRANE CO. IS NOT RESPONSIBLE FOR STRENGTH OF FIELDING MEMBERS FURNISHED BY OTHERS.



TC AMERICAN CRANE CO. - 614 BREV. MINNESOTA 55330
TC AMERICAN
 TITLE: HOIST TROLLEY - SPANMASTER
 DRAWN BY: DATE: SCALE: 1:2 SHEET 1 OF 1
 WEIGHT: 7558.07 LB
 RELEASED BY: DWG. NO. HTSM-20
 REV. 3 A



CRANE OPERATIONS INSTRUCTIONS

Introduction

Crane operators should be familiar with the parts of a crane and have a thorough knowledge of crane control functions and movements. The crane operator should be required to know the location and proper operation of the main conductor disconnecting means for all power to the attachments on the crane. Each crane operator should be responsible for the safe operation of the crane. Whenever there is any doubt as to SAFETY, the crane operator should cease using the crane and refuse to handle loads until: (1) safety has been assured or (2) the operator has been ordered to proceed by the supervisor, who then assumes all responsibility for the safety of the lift. The operator should test the crane movement and any attachments on the crane at the beginning of each shift. Whenever the operator finds anything wrong or apparently wrong, the problem should be reported immediately to the proper supervisor and appropriate corrective action taken.

TC/American's Spanmaster® Work Station Crane comprises a bridge section, suspended at each end from an end truck running on the lower flange of a runway beam. The bridge is itself, an enclosed track beam. Running inside this track is a hoist trolley, from which the hoist is suspended. The hoist may be manual, electric, or pneumatic. To deliver power to the hoist a festoon system is used. A flat cable is festooned along the bridge and one of the runway beams, supported by either festoon sliders or festoon trolleys. If the hoist is pneumatic, the same arrangement is used to bring the air supply to the hoist.

Your TC/American Spanmaster® Work Station Crane will give you years of satisfactory service as long as you observe the simple precautions set out below.

O1 The operating environment

The TC/American Spanmaster® Work Station Crane is ideally suited to the typical engineering workshop environment, that is, undercover, with temperatures in the range 25° to 110°F, and not exposed to significant thermal radiation, or concentrations of dust, solvents or acid spray in the air that would be a health hazard to human beings.

If the crane is to be used out of doors, TC/American recommends the fitting of weather shrouds to the end trucks.

If the crane is to be used in the vicinity of furnaces, and for the carrying of molten metal, thermal radiation shields must be fitted to the end trucks, and the hoist trolley and the crane is de-rated. Advice should be sought from the hoist manufacturer on methods of protecting the hoist from overheating, and de-rating. The design of runway beams and supporting steelwork may also require special attention in this case.

If the crane is to be used in an environment where the dust burden in the air is such that workers have to wear dust masks, then there may be a buildup of dust in the crane bridge internal track. This could eventually increase the effort required to move the hoist trolley, and it may be necessary to vacuum clean the track as required



O2 Maximum allowable weight of the suspended load

The suspended load is the item to be lifted, either directly connected to the hoist hook or indirectly via slings and/or under-hook devices. The maximum allowable weight of the suspended load is equal to the Safe Working Load of the crane, minus the total weight of sling(s) and any under-hook device. Consider an example, where the Safe Working Load of the crane is 550 lb., the hoist supports a lifting beam weighing 50 lb., and the lifting beam is attached to the suspended load by two soft slings each weighing 5 lb. The maximum allowable weight of the suspended load that can be lifted by this arrangement = $550 - 50 - (2 \times 5) = 490$ lb.

O3 Establishing the weight of the suspended load

For solid items of simple shape (round bar, flat bar, etc.), it is practical to calculate the volume of the suspended load and multiply by the density to get the weight. Note that structural steel has a density of 490 lbs/ft³, but some grades of stainless steel can have densities as high as 506 lbs/ft³.

For hollow items, or those of a complicated shape, calculating the volume may be impractical and therefore, the suspended load should be weighed on a weigh scale prior to lift, or lifted by a load cell attached to the hoist.

O4 Methods of attaching the suspended load to the hoist – slings and/or under-hook devices

The suspended load may be connected to the hoist via chain slings, wire rope slings, fabric slings, shackles to a lug or lugs welded or bolted to the suspended load, lifting eyes screwed into tapped holes in the suspended load, permanent magnet lifters, electromagnet lifters or vacuum lifters. For lifting long bars or beams, the use of a lifting beam attached to the hoist is recommended so that the final attachment to the suspended load is via two well-spaced slings. Note that the person rigging the load is required to be trained in that function.

Note that chain slings, electromagnet lifters, and lifting beams are heavy items and reduce the weight of the suspended load that can be lifted.

O5 Checking the condition of the slings and/or under-hook devices

Check that the slings and/or under hook devices are marked with a Safe Working Load that exceeds the weight of the suspended load.

Check the condition of slings and/or under-hook devices before using them. Soft slings showing signs of abrasion, or cuts, should be rejected. Wire rope slings with breaks in individual wires should be rejected. Chain slings and shackles showing signs of deformation or wear exceeding 10% should be rejected.



O6 Attaching the suspended load – stability of lift

The hoist hook should be above the center of gravity of the suspended load. If it is offset from the center of gravity, the suspended load will tilt when lifted, and if the slings are wrapped around it, not shackled to fixed lifting lugs, the slings may slide along the suspended load and cause further tilting. If the suspended load is on a lifting pallet and the slings are attached to the pallet, then the load must be secured to the pallet so that it cannot move around during the lift. DO NOT use a standard pallet for lifting.

O7 Lifting the suspended load

Check that the suspended load is free to lift, that is, there are no bolts, clamps, or welds attaching it to the bed of a machine tool or a workbench.

When using a two-speed electric hoist, always start the lift at the lower speed. Be aware that the suspended load may slide sideways or tilt as the hoist takes the load.

Stop the lift as soon as the suspended load has risen a few inches. If the suspended load has tilted, lower it back onto its original support and adjust the slings to get a level lift.

DO NOT permit ANYONE to ride on the hook or climb onto a suspended load.

DO NOT stand on, or hang from the hook and use the hoist to lift yourself off the ground

DO NOT stand under a suspended load.

O8 Moving the suspended load

Push the suspended load steadily until it is moving at a slow walking pace, and after that, only apply enough pressure to maintain steady movement. When approaching the destination, pull back steadily on the load to reduce its speed.

DO NOT move the load faster than a slow walking pace.

O9 Lowering the suspended load

Bring the suspended load to a complete halt before lowering it. Make sure that there is a clear, level surface to land it on, and that the surface can take the weight of the suspended load.

When using a two-speed electric hoist, always use the lower speed for the last few inches of lowering.

When the suspended load is landed, check that it is stable before fully lowering the hoist hook and removing the slings.

When slings are used, always land the load on cribbing to allow ample space to remove the slings.

DO NOT use the hoist to remove slings from a landed load.



GENERAL MAINTENANCE GUIDELINES

Frequent and Annual inspections are required to properly maintain your Spanmaster® crane.

M1 Working at heights

Visual inspections may be carried out from a step ladder, or a straight ladder leaning against a fixed structure (not the Spanmaster® bridge). For inspections at a higher level, and for physical work at any elevation, use a mobile access platform with suitable hand railing.

M2 Inspecting the crane, support structure and foundations

Check that the blue U-hanger at each end of the crane bridge is centered on the pivot bearing and that both U-hangers are vertical when the crane is square to the runway beams.

Check that there is no damage to the crane bridge or any part of the runways beams and their support structure, for example, local bending or denting from being hit by a forklift truck.

Check that there is no visible settling or cracking of the concrete slab around the column base plate.

If any damage is observed, contact the crane installer.

Check torque on connection bolts.

Check festoon cable for cracks or other damage to the sheathing.

Check that the festoon cables are uniformly supported by the festoon trolleys or sliders.

Check that the end stops at each end of the runway beams and at each end of the crane bridge, are intact and that the mountings are secure.

If the end stops are damaged or insecure, refer to section M6

Check that there is no damage to the festoon cables and that they are not kinked.

M3 Checking the free-running of the crane and of the festoon cables

With the crane loaded, traverse the suspended load over the full length of the crane bridge.

Check that the force required to maintain movement is uniform. Check that the festoon cable moves freely. With the suspended load under the runway beam that has the festoon cable

alongside, traverse the suspended load over the full length of the runway beam. Check that the force required to maintain movement is uniform. Check that the festoon cable moves freely.

With the suspended load under the other runway beam, traverse the suspended load over the full length of the runway beam. Check that the force required to maintain movement is uniform.

If the pivot post bush has a squeak, re-grease – see M4 below

M4 Greasing the pivot post bush (refer to drawing ETSM-20 on page 16)

Carefully lift the end of the Spanmaster® bridge approximately ½ **inch**, so that the U-hanger just lifts off the pivot post – see M11 below. Clean the pivot post on (item 4) and the bush (item 3) and re-grease. Carefully lower the end of the Spanmaster® bridge while guiding the pivot post bush in the U-hanger, onto the pivot post.



M5 Checking that support structure bolts are tight

Check that the following bolts are properly torqued:

Foundation bolts, bolts connecting header to a column, header to runway beams.

M6 Inspecting/replacing the runway beam end stops

Check the condition of the rubber end stops. If they are severely worn or are cracked across the face, replace them. The end stop is attached to its mounting bracket by a through bolt. Tighten the through bolt nut first to finger tight, and then 4 full turns. Do not overtighten. Check that the bolts connecting the end stop mounting brackets to the runway beam are tight.

M7 Removing/reinstalling the hoist

Removal of the hoist allows inspection and/or overhaul of the hoist to be done on a bench.

If the hoist is electric, isolate and lock off the electrical supply to the hoist.

If the hoist is pneumatic, isolate the air supply, operate the hoist to run the air out of the line, and then disconnect the air hose from the fixed air supply at the wall.

Disconnect the (festoon) power cable or the (festoon) airline. Using a mobile access platform, place a box underneath the hoist and raise the platform until it is just taking the weight of the hoist. Unhook the hoist from the hoist trolley.

Reinstalling is the reverse of removing.

M8 Inspecting/removing/reinstalling the bridge end stops

If the hoist has not been removed (M7 above), isolate and lock off the electrical or air supply to the hoist, and hang a large notice on the hook stating: MAINTENANCE IN PROGRESS – DO NOT USE THIS HOIST (or words to that effect).

Check the condition of the rubber end stops. If they are severely worn or are cracked, replace them. The end stop is mounted inside the end of the crane bridge internal track by a through bolt passing through the two vertical faces of the internal track. The through-bolt nut has a self-locking plastic insert. When reinstalling the end stops, tap the through-bolt until the underside of the bolt head is touching the vertical face of the internal track. Tighten the through bolt nut until its inside face is touching the other vertical face of the internal track. Do not tighten more than this or the through-bolt will distort the internal track.

M9 Removing/inspecting/replacing/reinstalling hoist trolley wheels and bearing

(refer to drawing HTSM-20 on page 18)

Remove the hoist (section M7 above).

Remove the bridge end stop (section M8 above) from one end of the crane bridge.

Remove the hoist trolley through the open end of the crane bridge internal track.

Inspect the condition of the hoist wheels. Slight roughening of the running surface is acceptable but if there are any cracks in any one of the wheels, then all wheels should be replaced. Spin the wheels and check for any noise, roughness in running or play in the bearings. If any of these apply to any of the wheel bearings, then replace all bearings as follows: Remove the axle circlip (item 15) and press the bearings off. Remove the circlip (item 4) from the wheel and remove the wheel. Replace the bearing and reassemble.

Reinstalling is the reverse of removing.





M10 Inspecting and cleaning the crane bridge internal track

Inspect the inside of the internal track through the slot along the bottom, using a mirror. If there is any accumulation of dust or debris, remove it with a vacuum cleaner. If there is any grease or sticky deposit on the running surface of the track, wipe it off with a rag dipped in solvent.

M11 Temporarily supporting the crane bridge to allow dismantling of the end trucks

Position a forklift truck (or mobile crane) so as to lift the crane only at the end where the end truck is to be dismantled so that the weight is not taken off both end trucks at the same time. Take care to prevent damage to the crane bridge. Using the forklift truck or the mobile crane, carefully lift the end of the Spanmaster® bridge approximately ½ inch, so that the U-hanger just lifts off the pivot post. (If the crane bridge is lifted too high, the top of the U-hanger will be jammed up against the underside of the runway beam, resulting on possible damage). Once the end truck is dismantled (see M12 below), the end of the crane bridge should be supported by a strap of sufficient strength, from the runway beam above so that if the forklift truck hydraulics settle over a period of hours, the strap will take the weight.

M12 Dismantling the end trucks - See drawing ETSM-20

Temporarily support the crane bridge (section M11 above and drawing ETSM-20 on page 16). Remove the locknut and nut (item 15) from the main axle (item 4) on the near side of the end truck. Take off, mark and retain any external spacer washers (item 14). Support the far side of the end truck, and lift off the near side plate (item 5), taking care to keep the main axle level so the internal spacer washers don't fall off. Liftoff the far side plate drawing the main axle out through the U-hanger. Mark and retain internal spacer washers (item 14) and spacer tube(s) (item 13) from the near side of the main axle. Remove the locknut and nut (item 15) from the far side of the main axle. Remove, mark and retain external and internal spacer washers and spacer tubes as for the near side.

M13 Inspecting the pivot post bearing, & the U-hanger needle roller bearings. - See drawing ETSM-20 on page 16

Temporarily support the crane bridge (section M11 above).

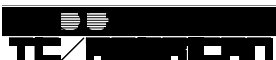
Dismantle the end truck (section M12 above).

Inspect the spherical plastic pivot post bush (item 3) in the top of the U-hanger (item 2). If it shows signs of wear, remove the U-hanger (see M14 below) so that the bush can be replaced on the bench.

Swing the U-hanger (item 2) from side to side and check for any noise, roughness or play in the needle roller bearings (item 17). If any of these apply to either of the two bearings, then replace both bearings.

M14 Disconnecting the U-hanger from the crane bridge - See drawing ETSM-20 on page 16

Clamp the end of the U-hanger to the end of the cross travel hanger plate (item 1), back off the nut, right to the end of the socket head shoulder screw (item 16), and drift the end of the screw until it releases from the hanger plate and the U-hanger. Remove the nut. Fully remove the





shoulder screw. Mark and retain, the washer (item 18) and any shim washers (item 24) so that they can be reinstalled in exactly the same positions.

Repeat this operation on the other side of the U-hanger. The U-hanger can now be removed to the bench.

M15 Replacing the pivot post bush & the U-hanger needle roller bearings. - See drawing ETSM-20 on page 16

The spherical, plastic, pivot post bush (item 3) is a push-fit in the socket at the top of the U-hanger (item 2). Push the old bearing out. Check that the internal surfaces of the bearing socket are clean and no traces of the original bearing remain. Lightly grease internal surfaces of the socket and push in the new bearing. The U-hanger needle roller bearings (item 19) are a push-fit in the legs of the U-hanger (item 2). Drift the old bearing out. Check that the internal surface of the bearing socket is undamaged by the drifting operation. Lightly grease the internal surface of the socket and push in the new bearing.

M16 Inspecting the main axle and the pivot post. - See drawing ETSM-20 on page 16
Check that the main axle (item 4), complete with pivot post on item 4, is straight. If it is bent, replace it. Check the condition of the bearing surface of the pivot post. As it is hard steel running against plastic, it is very unlikely to be worn.

M17 Inspecting/replacing the end truck wheels, wheel bearings and horizontal guide bearings - See drawing ETSM-20 on page 16

Inspect the condition of the end truck wheels (item 6). Slight roughening of the running surface is acceptable but if there are any cracks in any one of the four wheels, then all four wheels should be replaced. Spin the wheels and check for any noise, roughness in running or play in the bearings (item 7). If any of these apply to any one of the four-wheel bearings, then replace all bearings as follows. Remove external circlip (item 9) and draw the wheel and bearing off the bearing carrier axle. Remove internal circlip (item 8) and draw the wheel off the bearing. Check the condition of the circlip; if they are bent, replace them. Lightly grease all contact surfaces and reassemble. Spin the horizontal guide bearings (item 10) and check for any noise, roughness in running or play. If any of these apply to any one of the guide bearings, then replace all bearings as follows. Unbolt the socket head cap screws (item 12) and remove the lateral guide roller axle (item 11), complete with the bearing. Drift the axle out of the old bearing. Check that the surface of the axle is undamaged by the drifting operation. Lightly grease the contact surfaces and push on the new bearing. Reassemble. Torque the socket head cap screws.

M18 Reconnecting the U-hanger to the crane bridge - See drawing ETSM-20 on page 16
Lightly grease the contact surfaces and reassemble the U-hanger (item 2) onto the cross travel hanger plate (item 1), with shim washers (item 19) in their original positions. Tap the socket head shoulder screw (item 16), through items 2 and 1, Install washer (item 19) and the nut. Torque the shoulder screw.



M19 Reassembling the end trucks onto the runway beams - See drawing ETSM-20 on page 16

Assemble the main axle (item 4) to the far side plate, with the external and internal spacer washers (item 14), and the spacer tube(s)(item 13) for that side, in their original positions. Install the nut and locknut (item 15) and torque.

Lightly grease the pivot post bearing (item 3) in the U-hanger. Pass the side plate with the axle attached, through the U-hanger. Install the internal spacer washers (item 13), and the spacer tube(s)(item 13) for the near side, in their original positions and Install the near side plate. Install the near side external spacer washers (item 14), the nut (item 15), and tension. Check that the pivot post on item 4 is halfway between the side plates. Pull the end truck sideways so that the horizontal guide bearings on one side plate are hard up against the edge of the runway beam flange on that side. Check the clearance between the edge of the flange and the horizontal guide bearings on the other side plate. The gap should be between 1 and 4 mm. If the pivot post is not central, or the side clearance is outside the allowable range, the end truck must be dismantled and the spacer washers adjusted.

Note: The near side plate will rotate relative to the far side plate when the near side nuts are being torqued. To rectify this, place a small block of wood under the wheel that is touching the runway beam flange, and using a soft hammer, hit the top vertical face of the side plate to bring all the wheels into equal contact with the runway beam flange. Ensure nut torque is not released. Install and torque the last locknut.

M20 Lowering the crane bridge back onto the end truck – See drawing ETSM-20 pg 16

Ensure operations M18 and M19 above are complete. The end of the crane bridge will still be supported by the strap. Using the forklift truck or the mobile crane, carefully lift the end of the Spanmaster® bridge only enough to take the weight off the strap. Slacken the strap and using the forklift truck or the mobile crane, gently lower the end of the crane bridge while guiding the pivot post bush (item 3) in the U-hanger, onto the pivot post (item 4). Remove the safety strap used to support the bridge.

M21 Final check on the U-hangers when all other maintenance is complete. - See drawing ETSM-20 on page 16

When maintenance operations M11 to M20 have been completed at both ends of the crane bridge, position the crane bridge so that it is at 90° to the runway beams. Both U-hangers should be vertical. Confirm the cross-beam support (item 1) location per the bridge assembly drawing. If the U-hangers are not vertical, adjust the position of one or both of the cross-beam supports as follows:

Loosen the socket head screws (item 21) that are in the top and side faces of the cross-beam support (item 1). With a soft hammer, tap the cross-beam support to move it along the crane bridge internal track. When both U-hangers are vertical, re-tighten the socket head screws. Before torquing the top screws, use the side screws to position the track within the support (side to side). The slot in the bottom of the internal track should be centered within the cross-beam support DO NOT over tighten these side screws otherwise the width of the slot in the track will be reduced. Finally, torque the top screws.



WARRANTY & SERVICE POLICY

For warranty and service information, contact your authorized dealer or TC/American.

MAINTENANCE SCHEDULE

*State and local codes may differ. Please check the codes in your area.

ITEM	EQUIPMENT	DESCRIPTION OF MAINTENANCE	SCHEDULE*
1	Free Standing Assemblies	Check for loose bolts, level & square.	Yearly
2	Crane Systems	Check for level, square and all hanger bolts are properly torqued.	Yearly
3	End Truck & Hoist Trolley	Check wheel bearings on end trucks and trolleys. If worn replace.	Yearly
4	Electrical System	Check system for electrical shorts & replace worn parts.	Yearly
5	End Stops	Check all end stops & bolts. Replace if missing or damaged	9 months
6	Hoists	Refer to hoist maintenance manual for schedule.	As required.

* Suggested schedule is based on average usage. High-frequency use may require more frequent maintenance and or inspection.