

## Cranes

This is a general overview of the installation of TC/American cranes. While all cranes may appear to be similar, they are almost always unique; that is, custom built to a customer specification. Therefore, these instructions can only address installation in general.

These instructions must be used in conjunction with drawings provided with the shipment, plus separate instructions for individual crane components (end trucks, bridge beams, motorized trolleys, conductor bar, etc.) as applicable. Please see the separate installation instructions for these TC/American Crane products which may be downloaded from the TC/American Crane website, [tcamerican.com](http://tcamerican.com).

Refer to instructions provided with unique or specialized optional components, as applicable.

Do not attempt to perform the installation of a crane or any other equipment without the benefit of all applicable instruction sheets or guides.

### DANGER

#### Lifting Operations

Installation of equipment such as TC/American Crane's Cranes requires performance of overhead lifting operations. Proper lifting procedures involve training, skills and experience beyond the scope of this document. Workplace supervisors are responsible to assure that all persons under their supervision are properly trained, properly equipped, and are following safety practices appropriate for the lifting operation being employed.

### DANGER

#### Electrical Equipment Installation, Service and Maintenance

Persons performing installation, service or maintenance activities on, near, or with equipment that is electrically powered are exposed to electrical hazards that could result in serious injury or death if proper precautions are not followed. Before performing such work, disconnect the electrical power source for the system at the disconnect device and lock it out, following appropriate Lockout/Tagout (LOTO) procedures, to prevent electric power from being applied while work is being performed.

All persons must use safe work practices appropriate to the electrical system, and follow all workplace procedures and policies. This requires specific knowledge, equipment and training beyond the scope of this document. Workplace supervisors are responsible to assure that all persons under their supervision are properly trained, properly equipped, and are following appropriate safety practices.

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## Cranes

TC/American Crane offers several models of cranes, for all sizes of our rail. Selection of the appropriate model depends upon the load being handled (both current and anticipated future loads), service duty class, travel speeds required, and other factors.

### Crane Model Numbers:

(general information for TC/American Crane cataloged cranes)

- The prefix of the Model Number identifies the rail size used with the crane:
  - 2 = 200 Series Rail
  - 3 = 325 Series Rail
  - 45 = 450 Series Rail

Note: for 400 Series Rail, contact the factory
- The second character:
  - C = Crane
- The number identifies the load capacity:
  - 1000 = 1000 pound capacity (½ ton)
  - 6000 = 6000 pound capacity (3 ton)
  - 15000 = 15,000 pound capacity (7½ ton)
  - Etc.
- The suffix identifies the type of crane drive provided and also the general crane configuration:
  - HP = Hand Push driven crane, single girder
  - HC = Hand Chain driven crane (hand chain pocket wheel and roller chain reduction drive, located near one end truck, connected to a line shaft extending to each end truck, provided with under-the-end truck drive tires), single girder
  - MD = Center Motor driven crane (electric motor and reducer located approximately mid-span of the crane, with a line shaft extending to each end truck, provided with under-the-end truck drive tires), single girder
  - DM = Dual Motor driven crane (with motorized trolley drive mounted on each end truck), single girder
  - DGMD = Double Girder, Center Motor driven crane
  - DGDM = Double Girder, Dual Motor driven crane
- Miscellaneous suffixes
  - AMD = Air Motor Center Drive crane (electric motor replaced by air motor)
  - DTSG = Double Truss Crane with single girder, may be center or dual motor type
  - DTDG = Double Truss Crane with double girders, may be center or dual motor type

### Special Cranes:

Non-cataloged cranes for special projects, or adaptations of standard cranes to meet special needs.

- Multiple Runway Cranes (cranes to operate on three, four, five, six or more runways, as required, for long cranes)
- Dipping Cranes (cranes that pick up, transport and set loads into or from tanks used for cleaning and plating operations)
- Cranes with Rotating Bridge Beam (has a powered turntable built into the crane bridge, for horizontal rotation of a load)
- Cranes with Lifting Beam (a portion of the crane bridge is mounted on a lift device for vertical movement of a load)
- Stacker Cranes (crane fitted with a forklift type mast and fork carriage)
- Crane with Telescoping Bridge Beam (special crane with bridge beam that can be extended horizontally, beyond the normal crane overhang, to allow a load to be set or picked off to the side)
- Cranes with Fixed or Telescoping Masts (cranes generally used in aircraft maintenance and other industries and fitted with a personnel carrying platform)
- Other...contact the TC/American Crane sales office to discuss other special uses

**NOTE: See the appropriate section(s) of these instructions and of companion instructions for assembly, installation and maintenance details specific to your crane.**

**NOTE: For a specific parts breakdown of the crane provided with an order, see drawings provided with that shipment.**

## General Installation Instructions

### Crane Overview

Standard cranes manufactured by TC/American Crane are factory assembled and tested before shipment. The amount of field preparation to install a crane may be as simple as installing the trolleys, or it may require major re-assembly (as for a double girder crane that has been dis-assembled for shipping).

Depending upon the order, the crane may or may not be provided with a control panel, pendant control station, cross-bridge electrical conductor bars or festoon system, electrical collectors to the runway conductor bars, travel limit switches, etc. These options may be engineered, ordered and installed by others. However, some options, such as interlocks, are only available as factory installed.

Some components, such as end truck trolleys, are shipped loose and must be field installed on the crane. Monorail hoists, if sent to the TC/American Crane factory for mounting, will not be shipped on the crane.

Components or assemblies may be shipped loose (dis-assembled from the crane) to facilitate shipping and handling, or to prevent damage.

Special cranes are factory assembled to the degree possible, and may need to be dis-assembled for shipping.

For more general information about standard crane components or accessories, please see the Crane section of the TC/American Crane Price List and the Systems Catalog.

**NOTE:** equipment, components or assemblies provided by others, including hoist mounting, are also warranted and guaranteed by others. Assuring that appropriate components have been selected, and verifying their overall compatibility, is the responsibility of the selling dealer.

### Before beginning the installation:

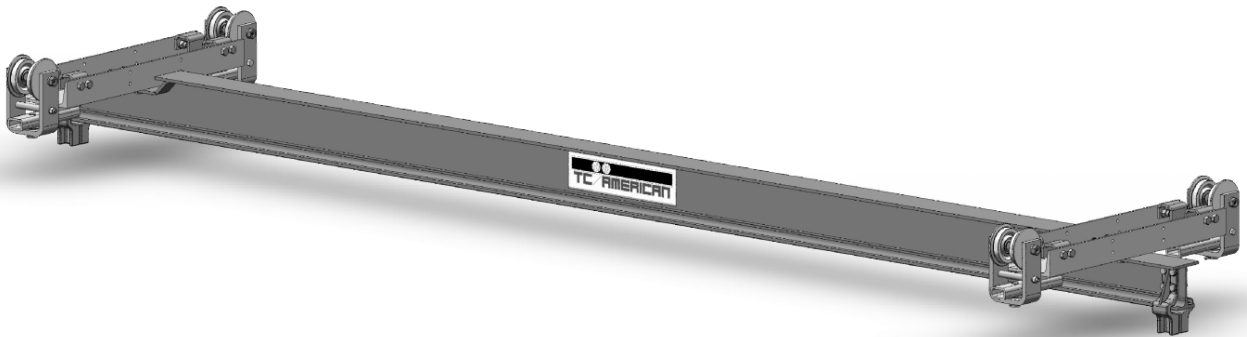
- When shipment is received, remove all shipping materials and visually inspect all parts for any damage. Repair and/or replace if necessary.
- Check packing lists against materials received and identify all parts.
- Gather all TC/American Crane drawings, plus any vendor equipment drawings, and keep in a secure location for reference during installation and start-up, and to give to the end user for future reference.
- See the TC/American Crane Systems Catalog and drawings provided with the shipment for details, part number information and electrical schematics.
- Store all equipment in a clean, secure area prior to installation.

### Installing Cranes:

- Check layout drawings for any notes.
- For information about crane runway rail installation, see *Patented Track Rail Installation Instructions – 200 Series; 325 Series; 400 Series and 450 Series*. For electrification systems, see the appropriate *Conductor Bar Installation Instructions*. For suspension of the runway, see *Suspension Installation Instructions*.

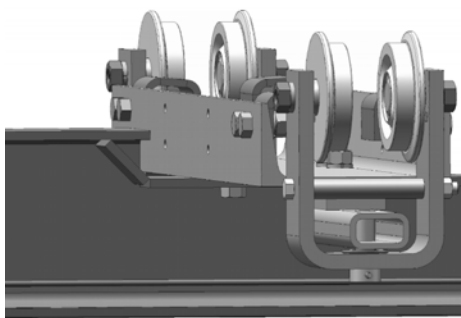
- **HAND PUSHED (HP) CRANES**

1. Single girder hand pushed cranes are usually shipped assembled, though trolleys may be shipped loose. Bridge electrification, if ordered, is factory mounted. See Figure 1 for a typical crane example.
2. Check drawing for site location of crane and move the crane to its correct position directly under the runways. Verify that runway rail spacing is the same as the crane span.
3. Remove shipping protection.
4. Turn trolley wheels by hand to check for possible damage in shipment. Look for rough bearings, loose bearings and axles.
5. If bridge electrification has not been installed at factory, it is recommended that this be installed on the crane bridge while it is still on the floor.
6. The process of installing end trucks and end truck trolleys onto the runway will vary, depending upon the rail series (200 Series and 325 Series rail) and the model of end truck used. Some trolleys have wheels that can be removed from the trolley yoke to enable the crane to be lifted up to the runway and installed on the rail by re-mounting the trolley wheels to the yokes. Other trolleys must be placed onto the runway rail (from an "open" rail end...remove end stop) before lifting the crane up to them. The procedure varies also depending upon whether it is a "4-wheel" (with two 2-wheel trolleys) or an "8-wheel" (with two 4-wheel trolleys) end truck. See the appropriate *End Truck Installation Instructions* for details.
7. Move crane the entire length of the runway, verifying that runway rails are gauged (spaced) correctly so crane does not drag; check all clearances and ease of operation; verify proper engagement to end stops.



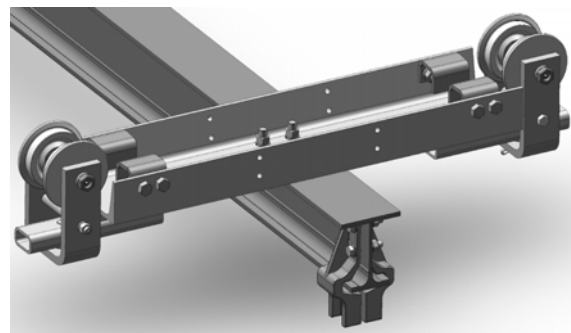
**Typical Hand Pushed Crane  
3C-2000-HP shown**

*Figure 1*



**View: End Truck Mounted in Optional Step Cut**

*Figure 1A*



**View: 3ET-5400-4 End Truck**

*Figure 1B*

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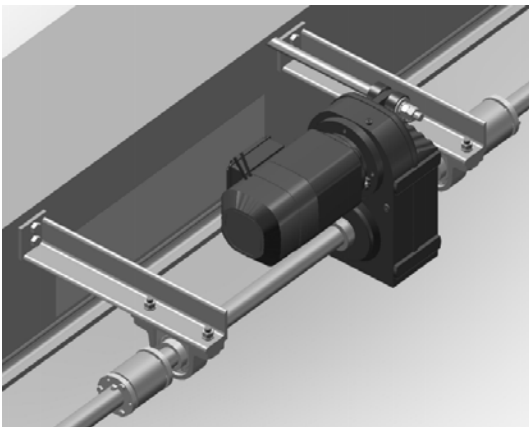
- **CRANES WITH CENTER MOTOR (MD) DRIVE**

1. Single girder and double girder, center motor propelled cranes are assembled and test run at factory, then may be shipped partially disassembled. Re-assemble as shown in drawings. This includes bridge electrification. See Figure 2 for a typical example.
2. Check drawing for site location of crane and move the crane to its correct position directly under the runways. Verify that runway rail spacing is the same as the crane span.
3. Remove shipping protection.
4. Turn wheels by hand to check for possible damage in shipment. Look for rough bearings, loose bearings and axles.
5. It is recommended that the bridge electrification be assembled and electrical connections done on the crane while it is on the floor.
6. Adjust drive tire supports so top surface of tire will be approximately 2" below bottom of rail. This allows the crane to be raised high enough to install the trolleys.
7. The process of installing end trucks and end truck trolleys onto the runway will vary, depending upon the rail series (200, 325 and 400 Series rail) and the model of end truck used. Some trolleys have wheels that can be removed from the trolley yoke to enable the crane to be lifted up to the runway and installed on the rail by re-mounting the trolley wheels to the yokes. Other trolleys must be placed onto the runway rail (from an "open" rail end...remove end stop) before lifting the crane up to them. The procedure varies also depending upon whether it is a "4-wheel" (with two 2-wheel trolleys) or an "8-wheel" (with two 4-wheel trolleys) end truck. See the appropriate *End Truck Installation Instructions* for details.
8. Check motor rotation before tire is adjusted against rail. Press forward and reverse buttons and interchange wires for phasing at motor terminal box to correct travel direction, if necessary.
9. Make sure tires at each runway are adjusted with equal pressure against the bottom of the rail tee section. (Refer to Drive Tire Adjustment Section in *End Truck Installation Instructions* for 200 and 325 Series).
10. Check that all crane assembly bolts are in place and tight. Check that drive shaft couplings are tight and keys in place.
11. Check lubrication of motor and gear unit. Refer to instructions provided with crane drive motor and gear case (gear reducer).
  - a) Install vent plug in gear case, in place of the topmost pipe plug.
  - b) Check level plug of oil in gear case and fill to level. Follow manufacturer's recommendation for type of oil.
  - c) After the first 100 hours of operation, the gear case should be drained, magnetic drain plug cleaned, and inspection made for any leakage. Refill the gear case with clean oil to the proper level. Do not overfill, as too much oil causes excess heating and leakage through the oil seals, decreasing the efficiency of the drive unit.
  - d) The oil should be inspected at regular intervals, and should be changed at least twice each year. Check gear reducer name plate for proper lubricant or equal.
  - e) When drive units are exposed to outside weather conditions and are not operated during the winter, the gear case should be completely filled with oil to prevent moisture and rust from forming in the case. Drain oil to proper level before restarting the drive unit.
12. Drives with brakes - observe that the brake is open and not dragging when unit is running. Check stopping action of brake under full load. Refer to manufacturer's instructions on type of brake and adjust as necessary.
13. Operate crane entire length of runways, verifying that runway rails are gauged (spaced) correctly so crane does not drag or skew; check all clearances and ease of operation; verify proper engagement to end stops.



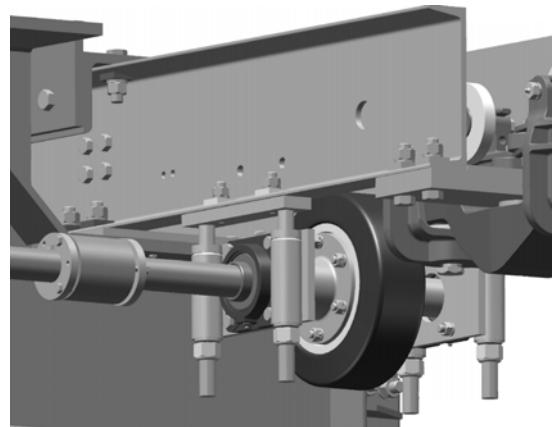
**Typical Center Motor Drive Crane  
Less Conductor Bar or Festoon  
with Optional End Truck Bracing  
3C-10000-MD**

*Figure 2*



**Typical MD Motor and Reducer Ass'y**

*Figure 2A*



**Typical MD Drive Tire and Spring Loaded  
Bearing Support Ass'y**

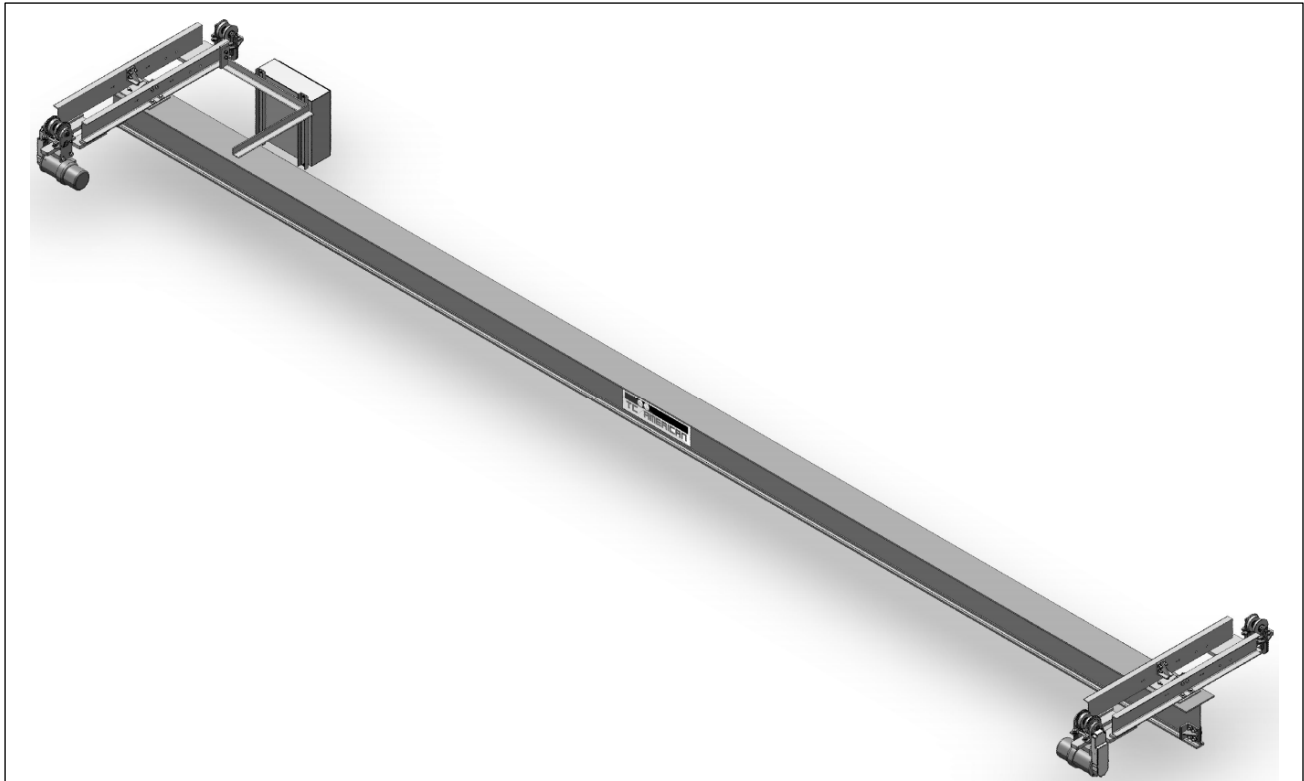
*Figure 2B*

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- **CRANES WITH MOTORIZED TROLLEY (DM) DRIVES**

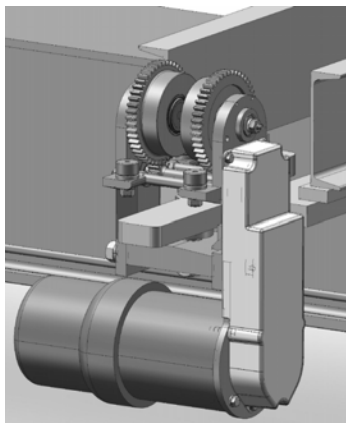
1. Single girder and double girder, motorized trolley cranes are assembled and test run at factory, and then may be shipped partially disassembled. Assemble as shown in drawings. This includes bridge electrification. See Figure 3 for a typical example of a 325 Series Single Girder Crane, Figure 4 for a 325 Series Double Girder Crane, and Figure 5 for a 450 Series Single Girder Crane.
2. Motorized trolley drives are only available for 325 and 450 Series cranes.
3. Check drawing for site location of the crane and move crane to correct position directly under the runways. Check that runway rail spacing is the same as the crane span.
4. Remove shipping protection.
5. Turn wheels by hand to check for possible damage in shipment. Look for rough bearings, loose bearings and axles.
6. It is recommended that the bridge electrification be assembled and electrical connections done on the crane while it is on the floor.
7. Remove trolleys and trolley drives from end trucks and place trolleys on rail in same relative position as crane on floor.
8. The process of installing end trucks and end truck trolleys onto the runway will vary, depending upon the rail series (325 Series and 450 Series rail) and the model of end truck used. Trolleys have wheels that can be removed from the trolley yoke to enable the crane to be lifted up to the runway and installed on the rail by re-mounting the trolley wheels to the yokes. Or, the trolleys may be removed from the crane, placed on the rail and the crane (with end truck frames mounted) lifted up under the rail. Trolleys may then be rolled onto and installed on each end truck (verify that spherical washer and thrust bearing are properly in place). The procedure varies also depending upon whether it is a "4-wheel" (two 2-wheel trolleys) or an "8-wheel" (two 4-wheel trolleys) end truck. See the appropriate *End Truck Installation Instructions* and *Motorized Trolley Installation Instructions* for more details.
9. Check lubrication of the motorized trolley units. See tag with motorized trolley drives and *Motorized Trolley Installation Instructions* for location of fill and check plugs.
  - a) Install vent plug in gear case, in place of the topmost pipe plug.
  - b) Check level plug of oil in gear case and fill to level with a good grade of SAE 90 gear oil.
  - c) After the first 500 hours of operation, the gear case should be drained, flushed, inspected for any leakage, and refilled with clean oil to the proper level. Do not overfill, as too much oil causes excess heating and leakage through the oil seals, decreasing the efficiency of the drive unit.
  - d) Oil should be inspected at regular intervals and be changed at least twice each year.
  - e) When drive units are exposed to outside weather conditions and are not operated during the winter, the gear case should be completely filled with oil to prevent moisture and rust from forming in the case. Drain oil to proper level before restarting the drive unit.
10. Check motor rotation. Press forward and reverse buttons and interchange wires for phasing at motor terminal box to correct travel direction if necessary.
11. Check that all crane assembly bolts are in place and tight.
12. Drives with brakes - observe that brake is open and not dragging when unit is running. Check stopping action of brake under full load. Refer to manufacturer's instructions on type of brake and adjust as necessary.
13. Operate crane entire length of runways, verifying that runway rails are gauged (spaced) correctly so crane does not drag or skew; check all clearances and ease of operation; verify proper engagement to end stops.





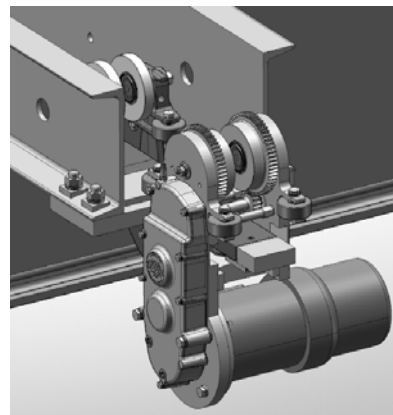
**Typical Motorized Trolley (Dual Motor) Drive Crane  
Less Conductor Bar or Festoon  
3C-4000-DM**

*Figure 3*



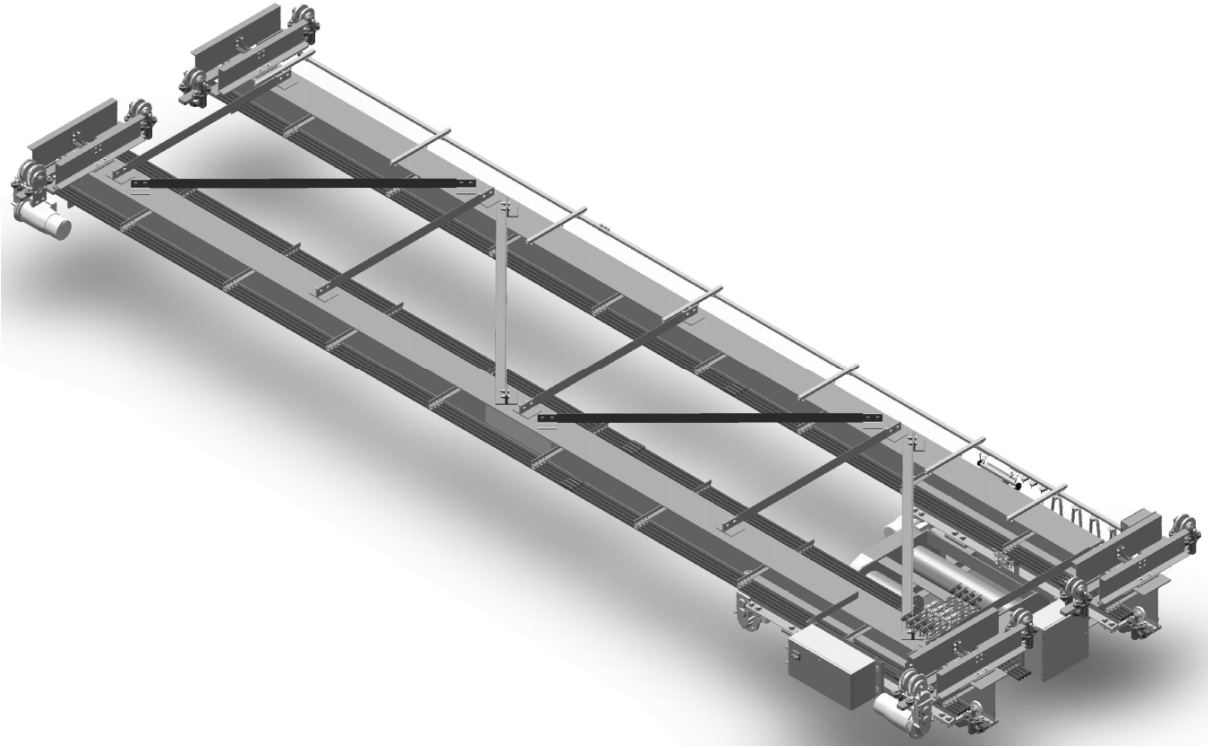
**“AT” Drive Ass’y on 4-Wheel End Truck**

*Figure 3A*



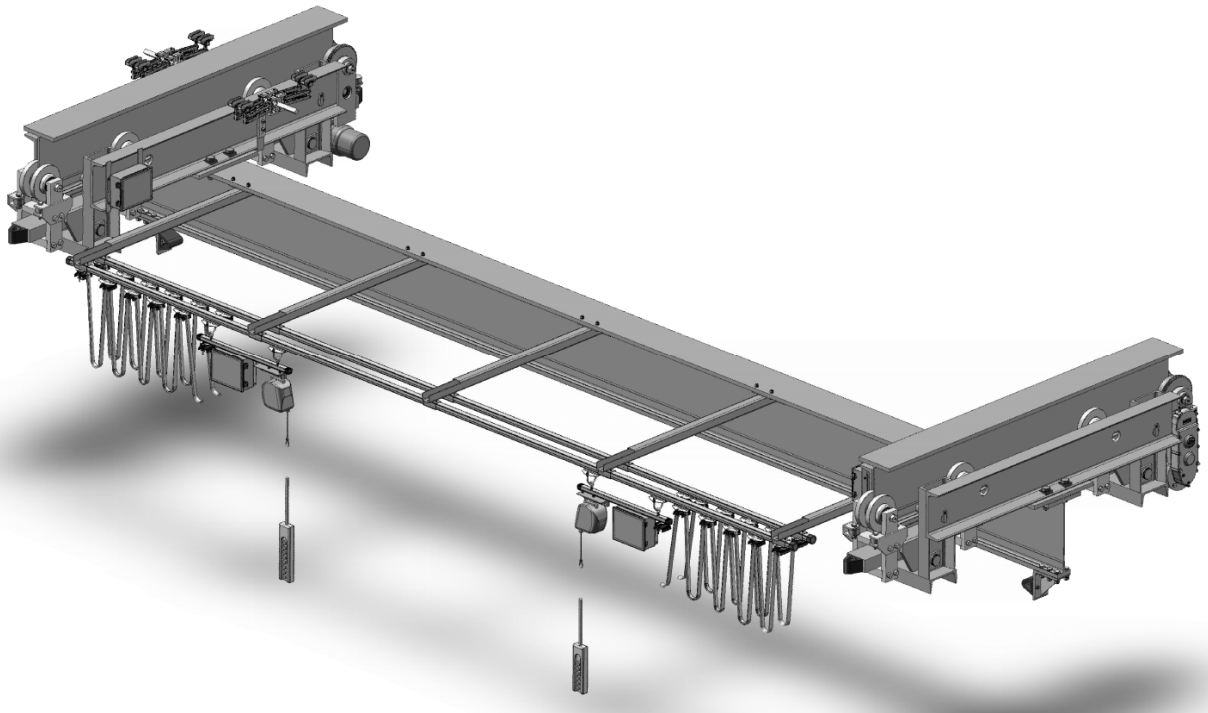
**“A” Drive Ass’y on 8-Wheel End Truck**

*Figure 3B*



**Typical Double Girder Crane with Double Girder Carrier  
3C-2000-DGDM, with Motorized Trolley Drives**

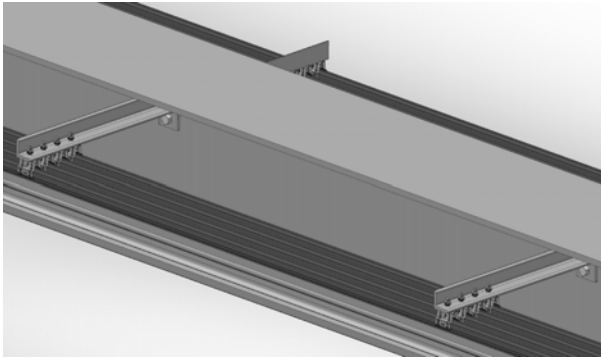
*Figure 4*



**Typical 450 Series Single Girder Crane  
with 60000 Pound End Trucks and Motorized Trolleys  
with one Festoon for Power (2 runs); one Festoon for PB Stations, Suspended from Tool Balancer**

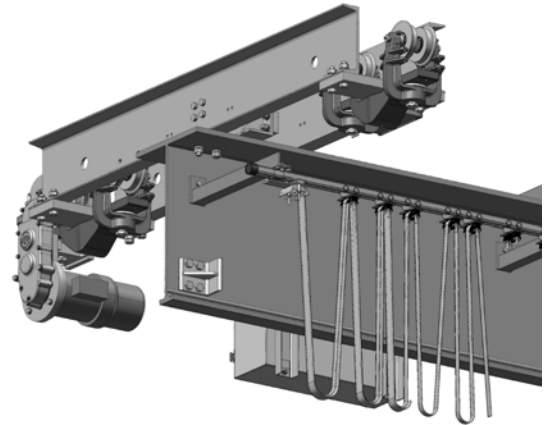
*Figure 5*

### Miscellaneous Crane Options



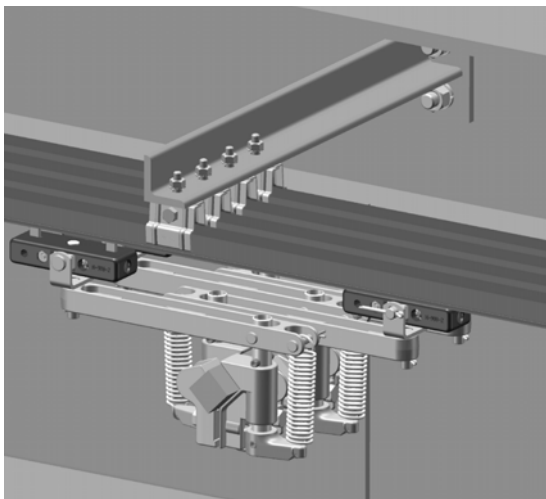
**Typical Bottom Contact Conductor Bar**

*Figure 6*



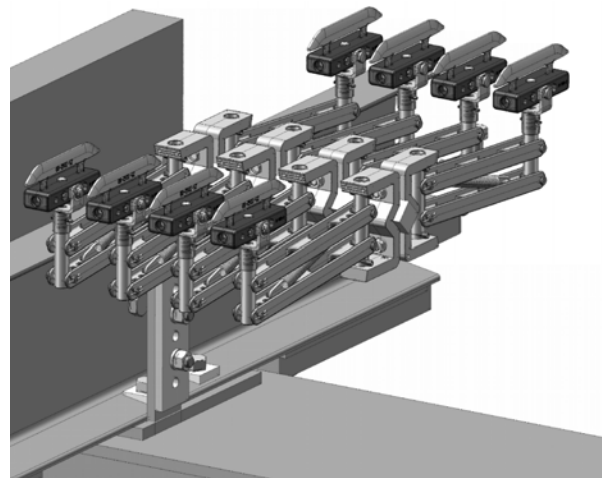
**Typical Festoon System, for Either Power or Pendant**

*Figure 7*



**Typical Arrangement, Staggered Bottom Contact Collectors**

*Figure 8*



**Typical Arrangement, Tandem Bottom Contact Collectors Mounted on Crane**

*Figure 9*

## Lubrication

### General Lubrication Information

Certain components of a crane require regular lubrication, such as idler trolleys, motorized trolleys and gearboxes. For lubrication information, type of lubrication and frequency, see the following TC/American Crane documents as appropriate to the crane:

- a) *Installation Instructions, 200 Series End Trucks*
- b) *Installation Instructions, 200 Series Trolleys*
- c) *Installation Instructions, 325 Series End Trucks*
- d) *Installation Instructions, 325 Series Trolleys*
- e) *Installation Instructions, 450 Series End Trucks*
- f) *Installation Instructions, 450 Series Trolleys*
- g) *Installation Instructions, Motorized Trolleys*
- h) *Installation Instructions, 200, 325 and 450 Series Interlocks*
- i) *Installation Instructions, Shielded Channel-Bar Electrification Systems*
- j) *Installation Instructions, Shielded Figure-8 Electrification Systems*

**NOTE:** before lubricating equipment that will be taken onto a customer's site, check with the customer for any preferences on brands or types (to maintain customer stock uniformity of products used and records maintenance).

**NOTE:** have Material Safety Data Sheet (MSDS) info available for any lubricants brought onto a work site.

**NOTE:** verify with customer that lubricants being used will not have an effect upon any production processes.