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Installation Instructions
10-3850-00

Interlocks – 325 Series

3I-9A; 3I-9B Crane Interlock and Operating Mechanism
3I-10A; 3I-10B Connecting Interlock

These instructions are for 325 Series Interlocks, Models 3I-9A, 3I-9B, 3I-10A and 3I-10B, as used with TC/American Crane's 325 "H" Series Patented Track rail.

An interlocking system consists of a least one crane with Crane Interlock and Operating Mechanism and at least one spur rail with Connecting Interlock. For some applications, the "connecting interlock" might be installed on a crane (i.e., see illustration on Page 6), and the "crane interlock" might be installed on a spur rail.

⚠ DANGER

Lifting Operations

Installation of equipment such as TC/American Cranes and Monorails with Interlocks 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.

Index

Note: all references in this document to design, features or adjustments for a 3I-9A or 3I-10A are also applicable to a 3I-9B or 3I-10B.

Interlocks

TC/American Crane offers several models of interlocks, for all sizes of our rail. Selection of the appropriate model depends upon the rail being used, load capacity of the crane and monorail, service duty class, and other factors.

Interlock Model Numbers:
(general information for all interlocks)

- The first character(s) of the Model Number identifies the rail size used with this interlock:
  - 2 = 200 Series Rail
  - 3 = 325 Series Rail
  - 45 = 450 Series Rail

  Note: for 400 Series Rail, contact the factory
- The second character:
  - I = Interlock
- The number, or number and letter pair, identify a model series:
  - 513 = 200 Series, Connecting Interlock
    (for 7" deep rail, for non-electrified or Bottom Contact electrification)
  - 515 = 200 Series, Crane Interlock and Operating Mechanism
    (for 7" deep rail, for non-electrified or Bottom Contact electrification)
  - 850 = 200 Series, Connecting Interlock
    (for 11" deep rail, for non-electrified and either Side or Bottom Contact electrification)
  - 930 = 200 Series, Crane Interlock and Operating Mechanism
    (for 11" deep rail, for non-electrified and either Side or Bottom Contact electrification)
  - 613 = 325 Series, Connecting Interlock
    (for 3RL8-18 rail, for non-electrified or Bottom Contact electrification)
  - 615 = 325 Series, Crane Interlock and Operating Mechanism
    (for 3RL8-18 rail, for non-electrified or Bottom Contact electrification)
  - 450 = 325 Series, Connecting Interlock
    (for 3RL13-27 or 3RL14-35 rail, for non-electrified or with either Side or Bottom Contact electrification)
  - 430 = 325 Series, Crane Interlock and Operating Mechanism
    (for 3RL13-27 or 3RL14-35 rail, for non-electrified or with either Side or Bottom Contact electrification)
  - 9A = 325 Series, Crane Interlock and Operating Mechanism
    (for mounting in 3RH14-41 rail, for non-electrified or with either Side or Bottom Contact electrification)
  - 9B = 325 Series, Crane Interlock and Operating Mechanism
    (for mounting in 3RH16-47 rail, for non-electrified or with either Side or Bottom Contact electrification)
  - 9C = 450 Series, Crane Interlock and Operating Mechanism
    (for mounting in 45R20-79 rail, for non-electrified or with either Side or Bottom Contact electrification)
  - 10A = 325 Series, Connecting Interlock
    (for mounting in 3RH14-41 rail, for non-electrified or with either Side or Bottom Contact electrification)
  - 10B = 325 Series, Connecting Interlock
    (for mounting in 3RH16-47 rail, for non-electrified or with either Side or Bottom Contact electrification)
  - 10C = 450 Series, Connecting Interlock
    (for mounting in 45R20-79 rail, for non-electrified or with either Side or Bottom Contact electrification)

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

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

General Installation Instructions

Terminology

The following instructions may use the following terms. For more information, please see the Crane Interlocks section of the TC/American Crane Systems Catalog.

- “Crane Interlock” – components of an interlock system typically installed on an end of a crane bridge beam, including a manually operated mechanism to engage or disengage the Crane Interlock to a Connecting Interlock on a Spur Rail or the bridge beam of an adjacent crane. May be installed on one or both ends of a crane bridge. Some interlocks may be provided with an optional motorized operating mechanism. For some applications, the “crane interlock” might be installed on a spur rail, and the “connecting interlock” might be installed on a crane. Double girder cranes must have interlock components installed on each crane bridge, and on each mating bridge or spur rail.

- “Connecting Interlock” – components of an interlock system typically installed on an end of a spur rail or an adjacent crane, and designed to mechanically engage or disengage with the Crane Interlock as desired. For some applications, the “connecting interlock” might be installed on a crane, and the “crane interlock” might be installed on a spur rail.

- “Spur Rail” – a length of monorail perpendicular to the crane runway and aligned with the bridge beam. The end of the monorail adjacent to the runway is supported by the runway with a Spur Support Bracket; other monorail supports are typical suspension components. Spur rails may be extended to include curves and switches as required for the system layout.

- “Spur Support Bracket” – a unique support bracket for the end of a spur rail; also known as a “gooseneck” bracket. One end of the bracket is bolted to the top flange of the runway rail, the other end to the top flange of the spur rail. Spur support brackets assure that alignment of the crane bridge treadline is maintained relative to the spur rail, even when the runway or spur rail deflects from loading.

- “Crossover Section” – a short section of monorail (or double rails for double girder cranes) located between and perpendicular to adjacent crane runway systems. Each end of the crossover monorail is supported by a bracket similar to a spur support bracket. Each end of the monorail is typically provided with a connecting interlock. Crossover sections are used when crane-to-crane interlocking is not possible or desired.

- “Runway Deflection” – vertical movement of the runway rail between support points. See the Engineering Section of the TC/American Crane Systems Catalog for methods of calculation and selection of appropriate rails. Runway rail at spans where interlocking will take place are generally sized for less deflection than the rail in other spans, therefore the rail in these spans may be deeper than those in other spans.

- “Manual Operation” – the mechanism that engages or disengages the interlock device is operated by pulling on a rope or chain connected to the operating mechanism. Alignment of crane to spur rail is judged by visual observation.

- “Motorized Operation” – option where the manually operated mechanism is replaced by an electric motor, gearbox and linkage. Requires additional buttons on the pendant station or controller. Includes limit switches and indicator lights to show crane to spur rail alignment. Includes a limit switch to disable crane movement when the interlocks are engaged. Recommended for systems greater than 5 ton capacity.

- “Gap Spacer” – a fixed mechanical guide mounted on the crane that engages a mating guide roller on an arm on the spur rail, crossover section or adjacent crane. Assures proper horizontal spacing of the end of the bridge beam to the end of the spur rail.

Interlock Overview

Interlocks allow a crane to mechanically connect to one or more spur rails, to a crossover rail section between parallel runways, or directly from one crane to another on parallel runways. Loads may then be transferred directly from crane to spur rail, or crane to crane, without re-handling the load.

Interlocks are factory mounted into monorail and crane bridges, and are shipped complete. Attention to field alignment and adjustment procedures (similar to typical crane and monorail alignment and adjustments) will provide years of trouble free operation.

For more information, please see the Crane Interlocks section of the TC/American Crane Systems Catalog.

Before beginning the installation:

- When shipment is received, remove all shipping materials and visually inspect all parts for 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 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.

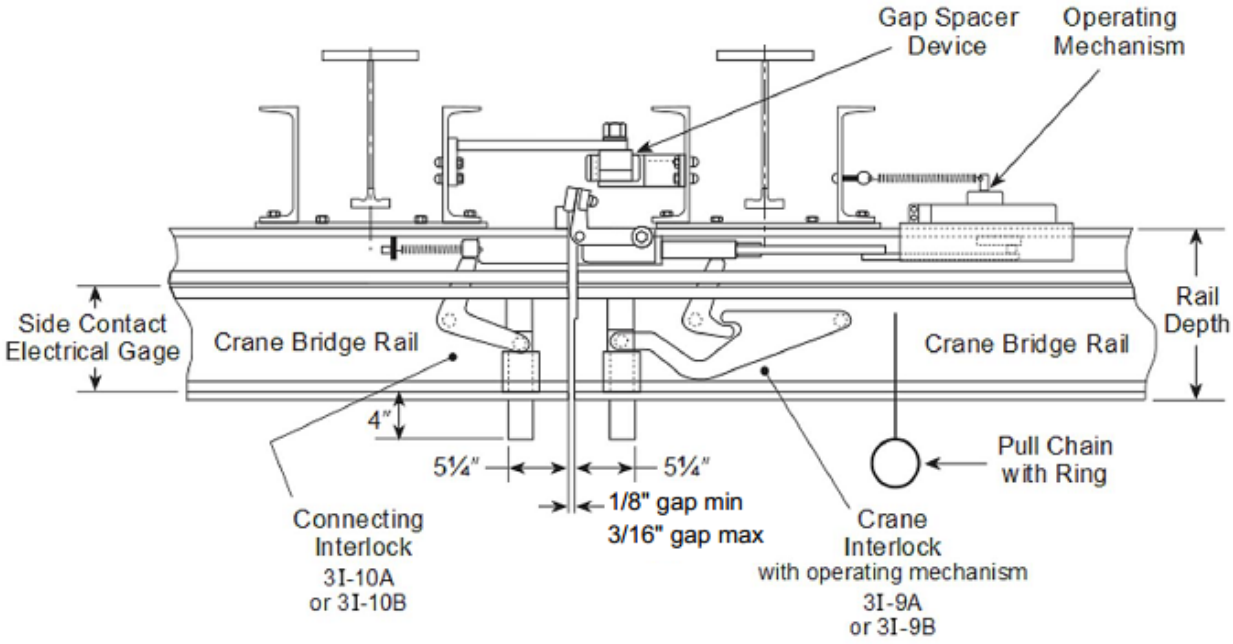
Installing Cranes and Spur Rails in an Interlocking System:

- Check layout drawings for any notes.
- TC/American Crane crane interlocks mounted in crane bridges and monorails are shipped fully assembled.
- Installation of a runway, crane and monorail system with interlocks should begin at the point where a spur rail or crossover section is located and work out from there, adding runway rail and monorail pieces sequentially. For systems with multiple spur rails or crossovers, begin with the groupings and proceed from there. For more information, see *Monorail and Runway Rail Installation Instructions*. If the monorail portion of the system includes switches, see the appropriate *Switch Installation Instructions*. For electrification systems, see the appropriate *Conductor Bar Installation Instructions*. For suspension of the runway and monorail, see *Suspension Installation Instructions*.
- Verify treadline alignment at all interlock locations.

Initial Start-Up:

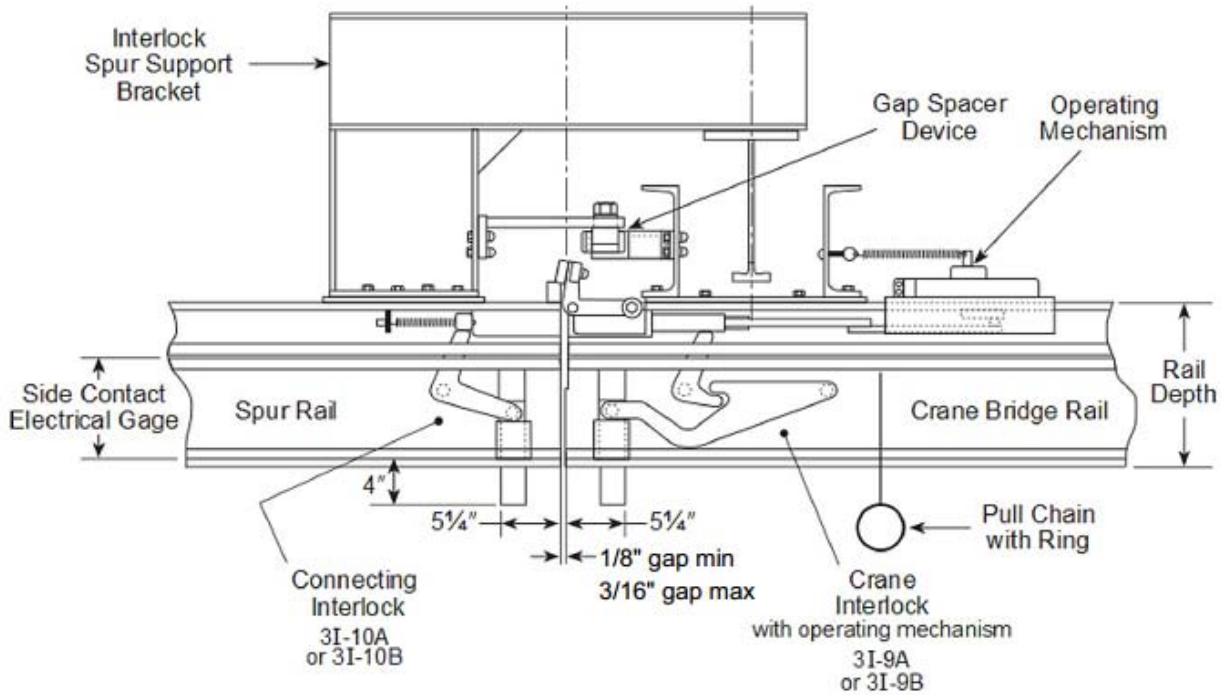
- After installation of runway, crane and spur rail components, operate all interlocks several times.
- Verify proper alignment at each interlock location.
- Verify proper engagement of each Crane Interlock to a corresponding Connecting Interlock.
- Run hoist carriers or trolleys through the interlocks to check clearances and smooth transition.
- Verify that safety stops on the interlocks properly contact the hoist carrier or trolley to prevent it from falling off when an interlocking rail end is not aligned to a corresponding rail end.

325 Series Interlocks



Interlocking Crane to Crane (325 "H" Series)

Cranes may be latched or interlocked directly to each other for bridge-to-bridge carrier transfer.



Interlocking Crane to Spur (325 Series)
(Typical)

325 Series Interlocks

Crane Interlock with Manual Operating Mechanism

Model	Part Number	Figure
3I-9A	10-3110-xx	Figures 1, 2 and 3
For typical installation in 3RH14-41 rail.		
3I-9B	10-3112-xx	Not Shown
For typical installation in 3RH16-47 rail.		

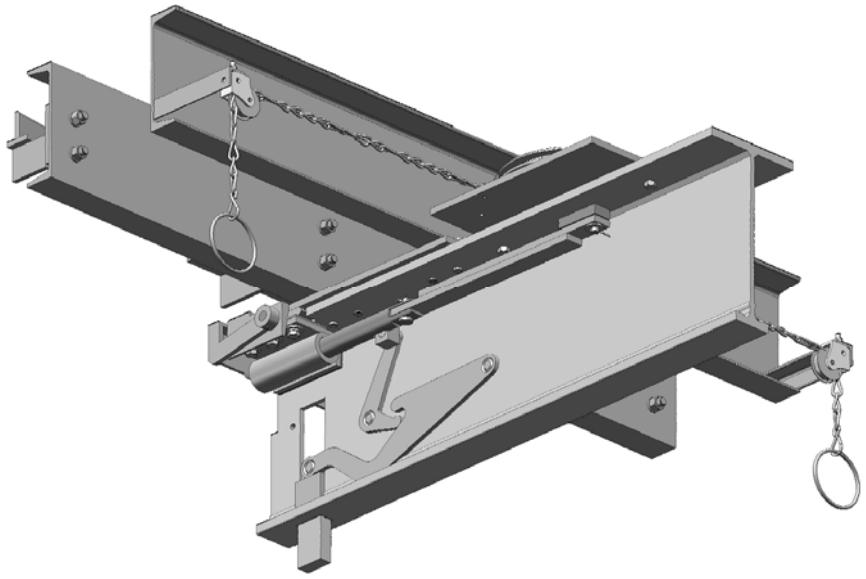
Part Number Note: the last two digits of the crane interlock part number varies, depending upon crane end truck used and web thickness of bridge beam.

Step Cut or Notch: If bridge beam is deeper than 14" or 16", it must be "step cut" or "notched" to either 14" or 16". See Figure 11.

Figure 1: typical 3I-9A Crane Interlock with Manual Operating Mechanism (shown with only a segment of a crane bridge beam; end truck shown less trolleys; pull chains and rings shown for reference only, actual drop length is longer).

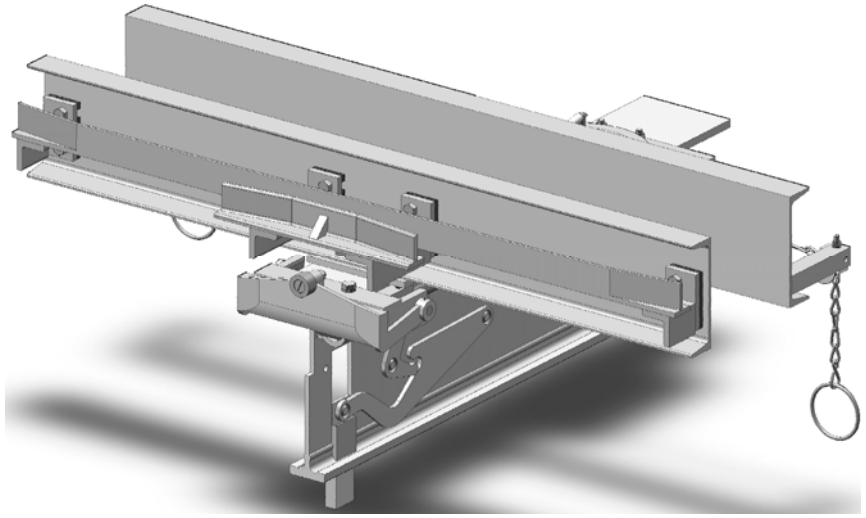
Electrification Note: Cranes with these interlocks may be provided with either side contact or bottom contact Shielded Channel-Bar or Shielded Figure-8 Bar electrical conductors. Conductor bars are not shown in these views for clarity. For information on conductor bar installations, see *Shielded Channel-Bar Electrical Conductor Installation Instructions* or *Shielded Figure-8 Electrical Installation Instructions.*

Figure 2: view of gap spacer guide (bolted to end truck frame) and an interlock "keeper." The keeper is device that overhangs the end of the latch pin and prevents interlock actuation unless the crane interlock is aligned with a connecting interlock. A roller on the keeper rides up the ramp on the connecting interlock to raise the keeper and allow latch pin extension…see Figure 17.



3I-9A Crane Interlock
View of manual operator linkage.

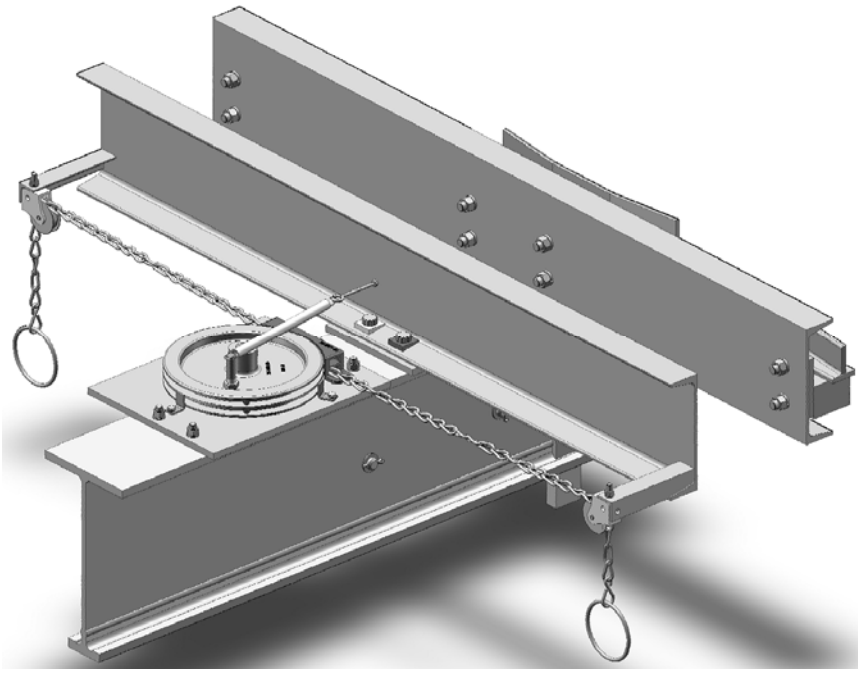
Figure 1



3I-9A Crane Interlock
View of end of crane bridge, interlock "keeper" and gap spacer guide.

Figure 2

Figure 3: view of a crane interlock with a manual operating mechanism (pull chains connected to a sheave). The sheave shaft has a crank arm that pulls or pushes the linkage connected to the latch pin (see Figures 1 and 6).



3I-9A Crane Interlock
View of interlock with manual operating mechanism.

Figure 3

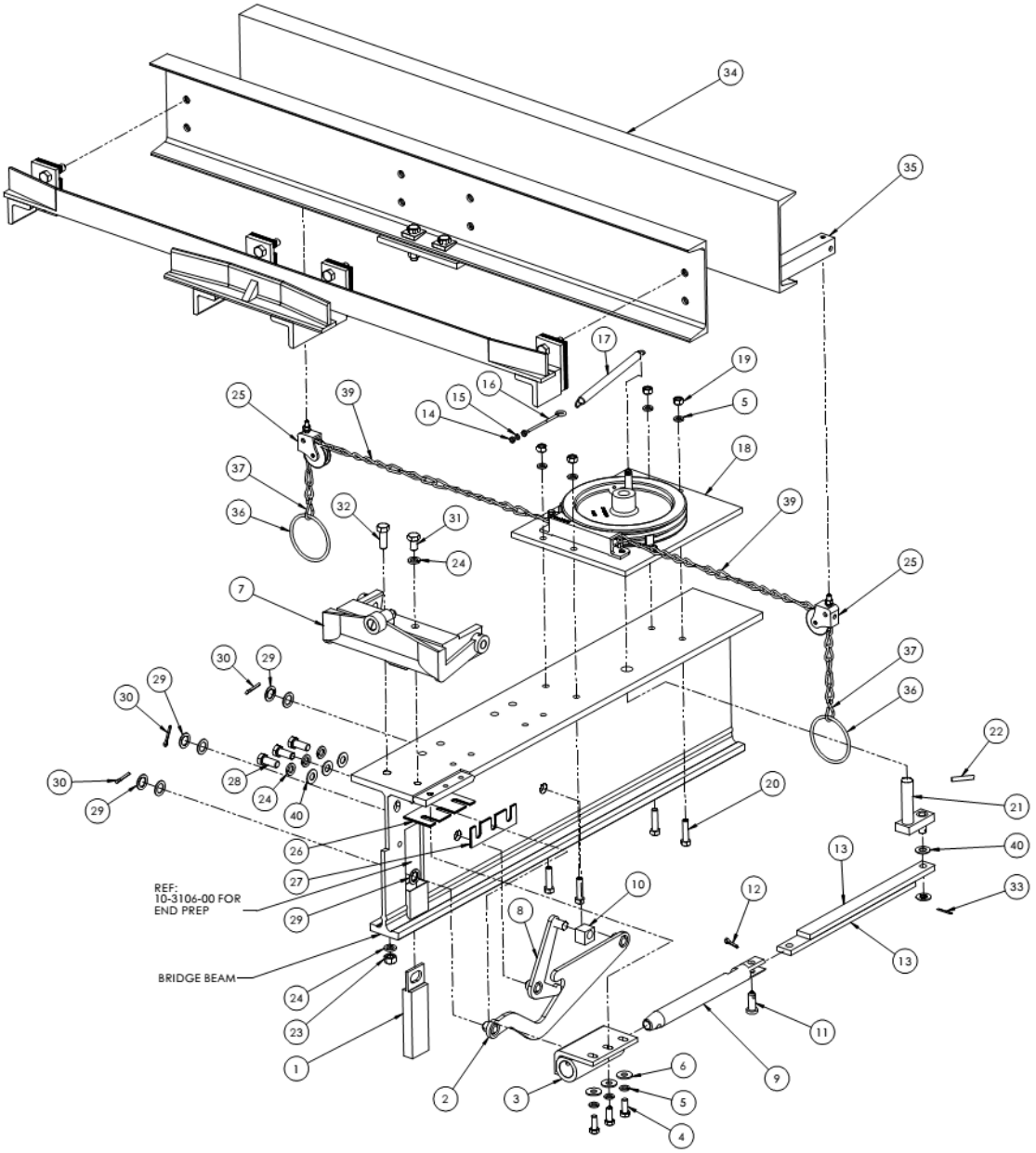
Motorized Operating Mechanism (Option)

Interlocks may be provided with an optional motorized operating mechanism (a motor and reducer assembly replaces the manual operating mechanism). See Figures 18 thru 22 for typical views.

A motorized operating mechanism is optional for cranes of 5 ton and less, and is required for capacities above 5 ton.

See Pages 16 and 17 for detailed information about motor operated interlocks.

Contact the factory for applicability of air operated systems.



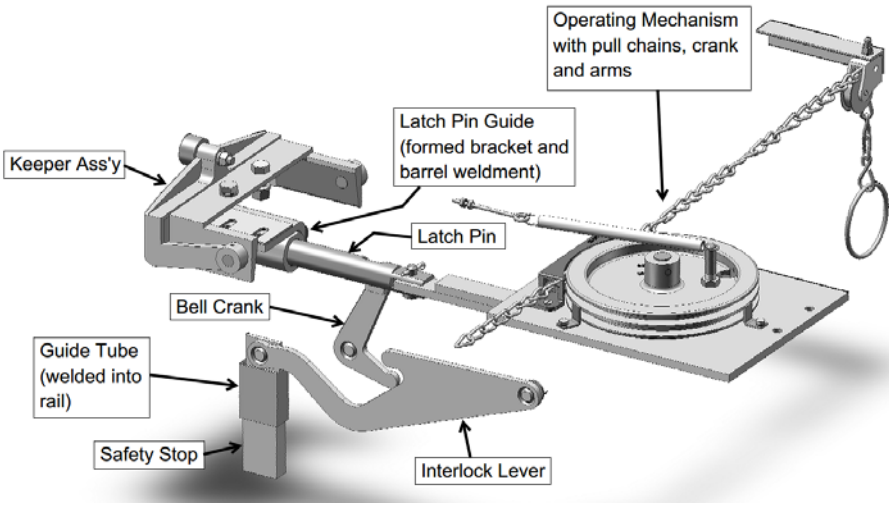
3I-9A Crane Interlock

Figure 4

Item #	Description
1	Safety Stop
2	Interlock Lever
3	Latch Pin Guide
7	Keeper / Hinge Pin Ass'y
8	Bell Crank
10	Adjustment Block
13	Crane Arm (half, two req'd)
17	Spring
18	Sheave Ass'y
21	Crank
25	Chain Sheave
26	Top Flange Shims
27	Web Shims
36	Ring
37	Chain

Note: Common hardware items not identified.

Details of 3I-9 Crane Interlock



Crane Interlock Mechanical Components

Figure 5

Figure 4: Exploded view of crane interlock. See drawings provided with crane for part numbers.

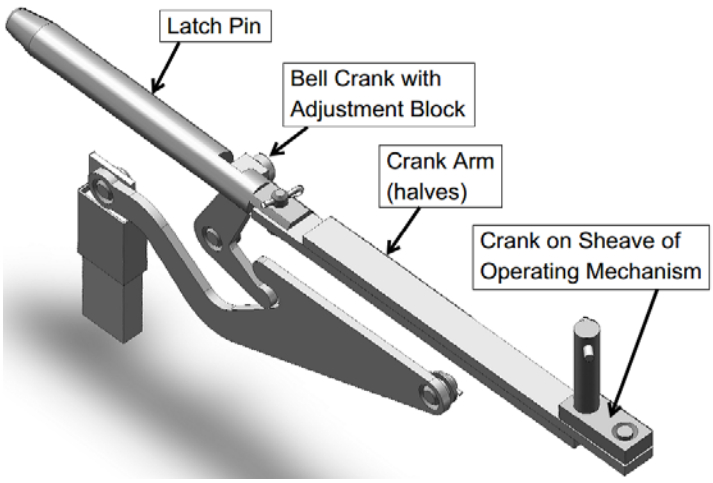
Figure 5: Crane Interlock mechanical components (bridge beam, end truck channels and portion of chain for operating mechanism not shown for clarity). See Figure 9 for Gap Spacer Guide.

Figure 6: details of Crane Interlock Latch Pin, Hook Latch and Adjustment Block.

An Adjustment Block is mounted on the Bell Crank pin and engages the machined notch in the Latch Pin. Rotate Adjustment Block as required (used as an eccentric adjuster) to most completely engage the Latch Pin notch throughout the travel arc of the Bell Crank arm (see Figure 6A).

The interlock Lever and Bell Crank are secured to the rail web with machine bushings and cotter pins. Use machine bushings as required to space the Lever and Bell Crank so they do not “scrub” the face of the web during operation. The Latch Pin is held in place by the Latch Pin Guide and the pivot pin connection to the Crank Arm. The Adjustment Block “floats” on the Bell Crank pin and within the Latch Pin notch, and is captured on the Bell Crank pin by the rail web.

The Crank Arm assembly is two halves that are overlapped and shop welded to length as required. See Figure 6. When the Crank is fully retracted (interlock disengaged), the nose of the latch pin must be flush with the end of the Latch Pin Guide (ref: Fig. 7A), and project 3 5/8” beyond the end of the bridge when extended.



Details: Latch Pin, Bell Crank, Adjustment Block

Figure 6

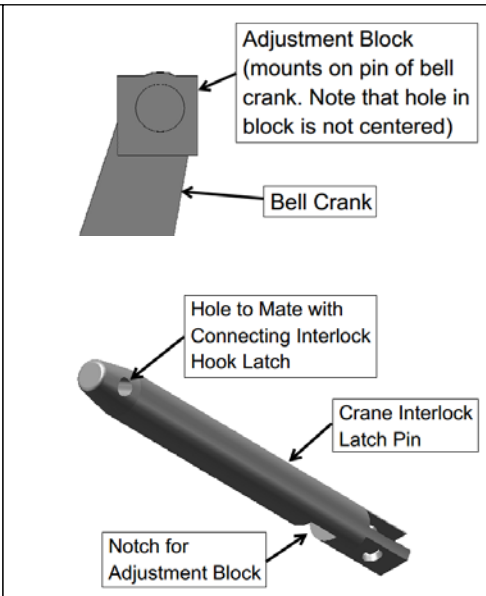
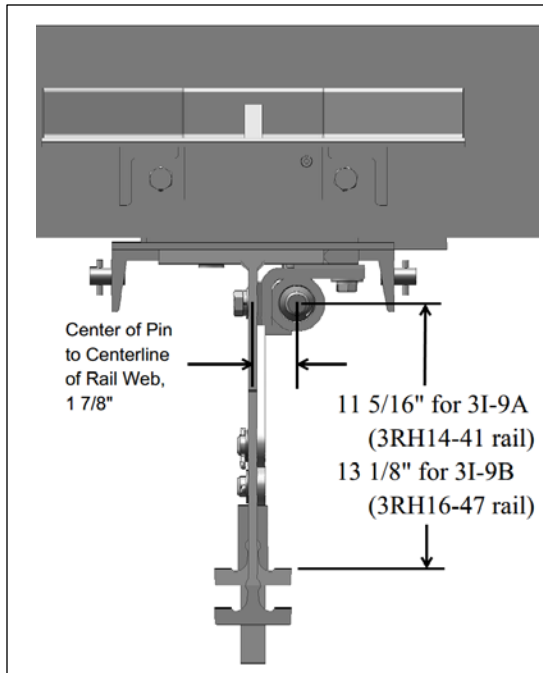


Fig. 6A

Figure 7: design location for center of the Crane Interlock Latch Pin. Adjust to dimensions with shims between the Latch Pin Guide (formed bracket and barrel weldment – see Figure 7A) and the top flange and web. These dimensions must exactly match a similar latch pin location on the Connecting Interlock (reference Figure 15).



Latch Pin Location

Figure 7

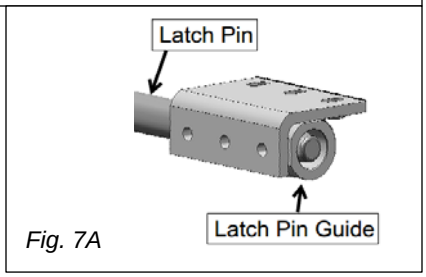
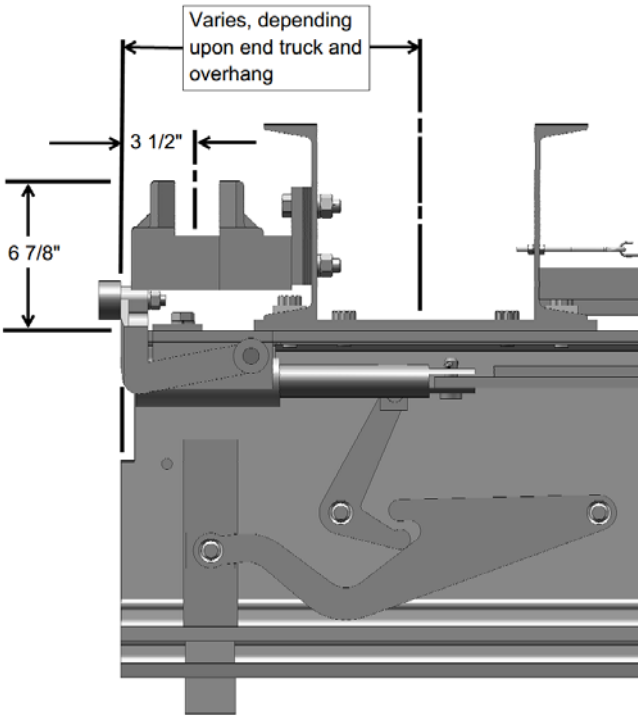


Fig. 7A



Gap Spacer Guide Location

Figure 8

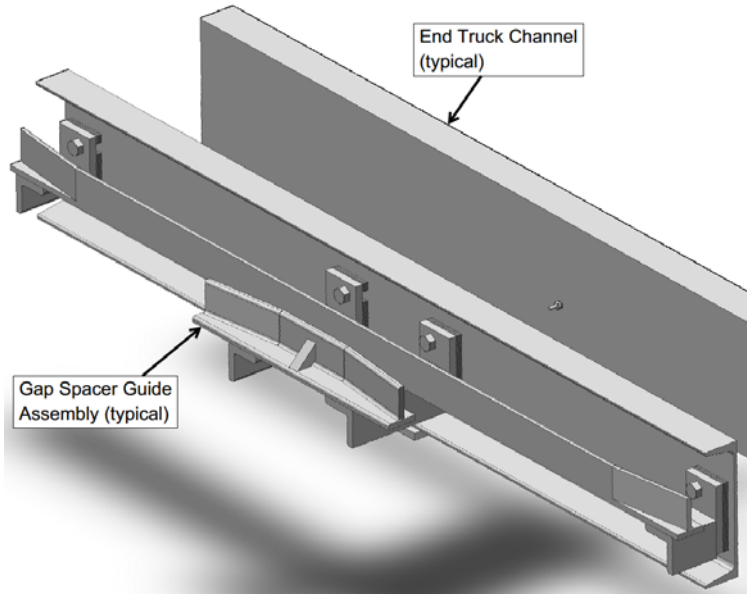
Figure 8: design location of Gap Spacer Guide, as measured from end of rail to centerline of gap spacer. Adjust to dimension with shims between guide and end truck frame.

Note: dim. 6 7/8” is set at factory assembly, within mfg. tolerances.

Figure 9: typical Gap Spacer Guide assembly, mounted to end truck frame.

Gap Spacer Roller on Connecting Interlock engages guide to hold bridge-to-bridge or bridge-to-spur clearance of 1/8” minimum, 3/16” maximum (see Page 6).

Gap Clearance Note: maintained by the difference between the 3 1/2” dimension from end of rail to centerline of Gap Spacer Guide (see Figure 8) as compared to 3 5/8” dimension from end of rail to the centerline of the Gap Spacer Arm Roller (reference Figure 16).



Gap Spacer Guide (typical)

Figure 9

325 Series Interlocks

Connecting Interlock

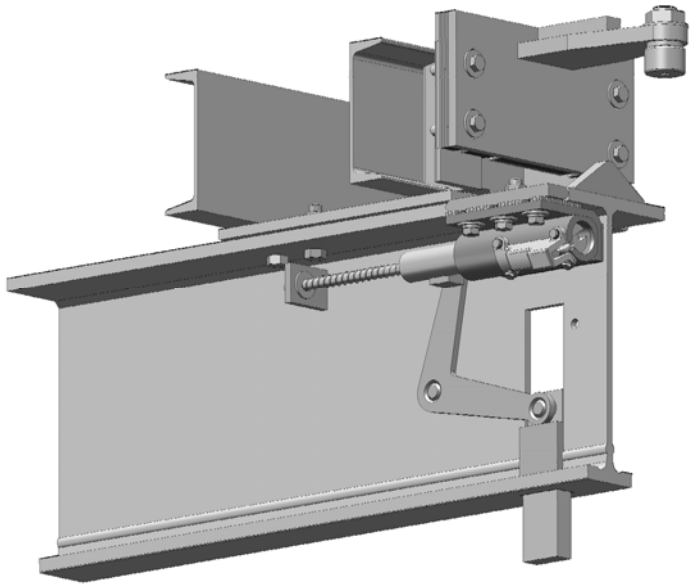
Model	Part Number	Figure
3I-10A	10-3111-xx	Figure 10
For typical installation in 3RH14-41 rail.		
3I-10B	10-3113-xx	Not Shown
For typical installation in 3RH16-47 rail.		

Part Number Note: last two digits of the connecting interlock part number varies, depending upon crane end truck used and web thickness of bridge beam.

Figure 10: typical 3I-10A Connecting Interlock and the Gap Spacer Arm with Guide Roller (shown with a segment of a spur rail or crane bridge beam. In this view, the connecting interlock is shown as being mounted in a bridge beam, with channels to represent an end truck frame).

Figure 11: a typical rail prep for interlock with step cut. If a spur rail or crane bridge is deeper than 14" or 16", it must be "step cut" or "notched" to either 14" or 16", as shown in this typical example.

Figure 12: Exploded view of connecting interlock. See drawings provided with crane for part numbers.

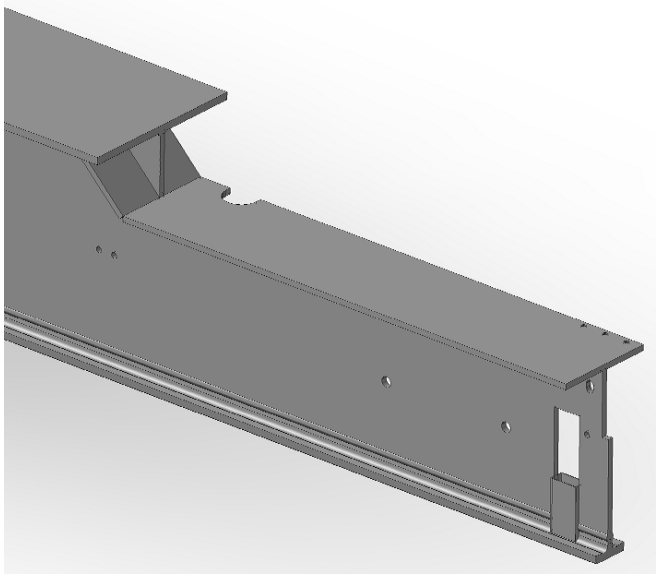


3I-10A Connecting Interlock

Figure 10

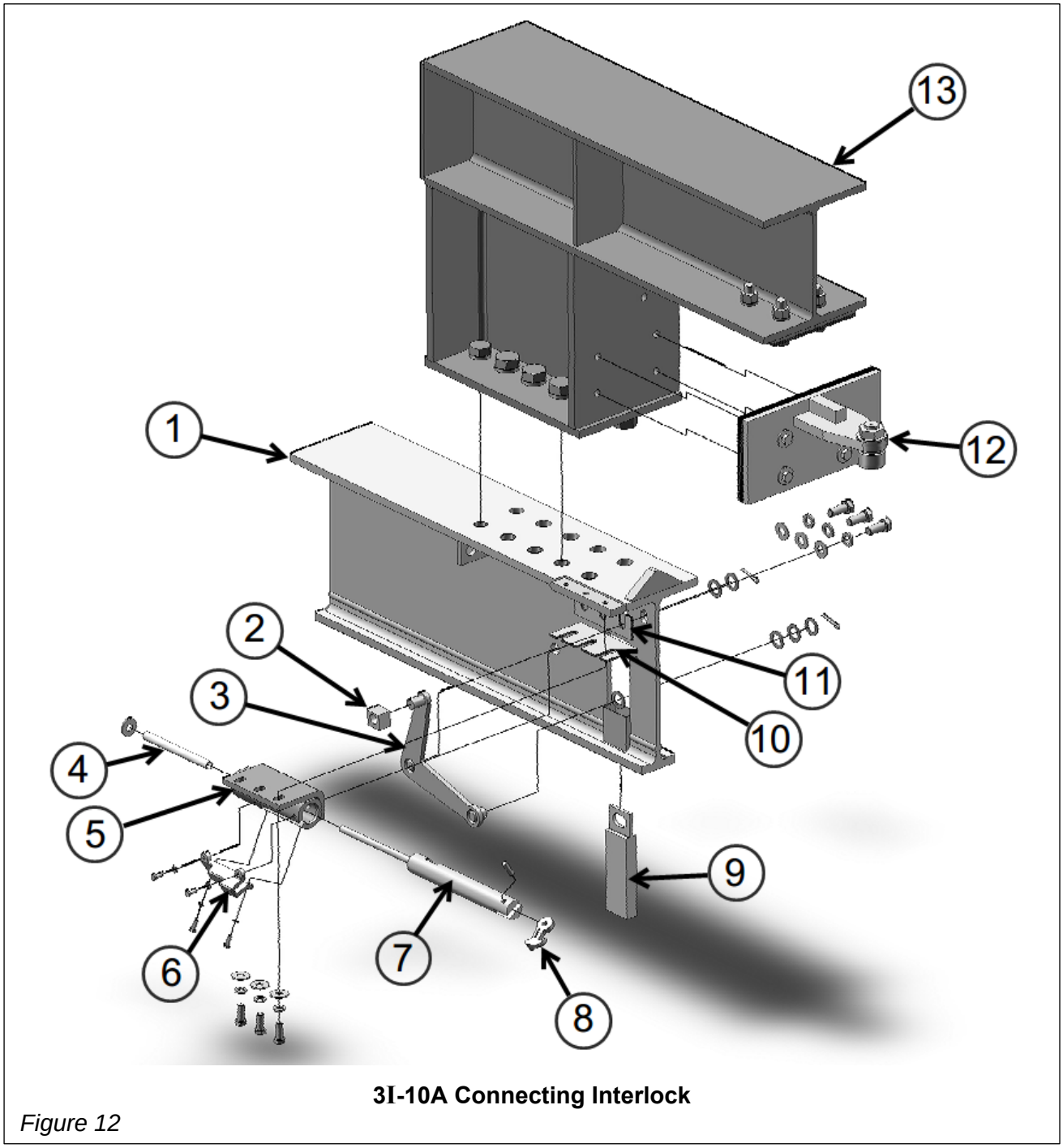
Treadline Alignment: alignment of the treadline of cranes to spur rails is as critical as any runway or monorail installation. Adjust the spur rail treadline elevation to the crane treadline elevation by adding or removing shims under the Spur Support Bracket where it rests upon the top flange of the runway. See Figure 12. Also see *Monorail and Runway Rail Installation Instructions*.

Electrification Note: Spur rail or cranes with these connecting interlocks may be provided with either side contact or bottom contact Shielded Channel-Bar or Shielded Figure-8 Bar electrical conductors. Conductor bars not shown in these views for clarity. For information on conductor bar installations, see *Shielded Channel-Bar Electrical Conductor Installation Instructions* or *Shielded Figure-8 Electrical Installation Instructions.*



Typical Bridge Beam Step Cut or Notch
(with top flange cutout for operating mechanism crank)

Figure 11



3I-10A Connecting Interlock

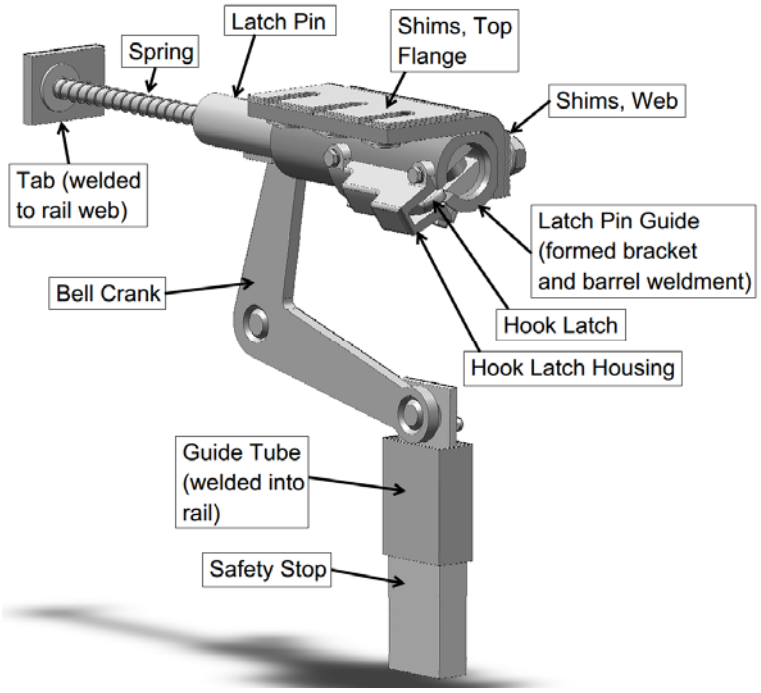
Figure 12

Item #	Description
1	Spur Rail (or Bridge Beam Section)
2	Adjustment Block
3	Bell Crank
4	Spring
5	Latch Pin Guide
6	Hook Latch Housing
7	Latch Pin

Item #	Description
8	Hook Latch
9	Safety Stop
10	Top Flange Shims
11	Web Shims
12	Gap Spacer Arm Ass'y and Shims
13	Spur Support Bracket (typical)

Note: Common hardware items not identified.

Details of 3I-10 Connecting Interlock



Detail, Connecting Interlock Mechanical Components

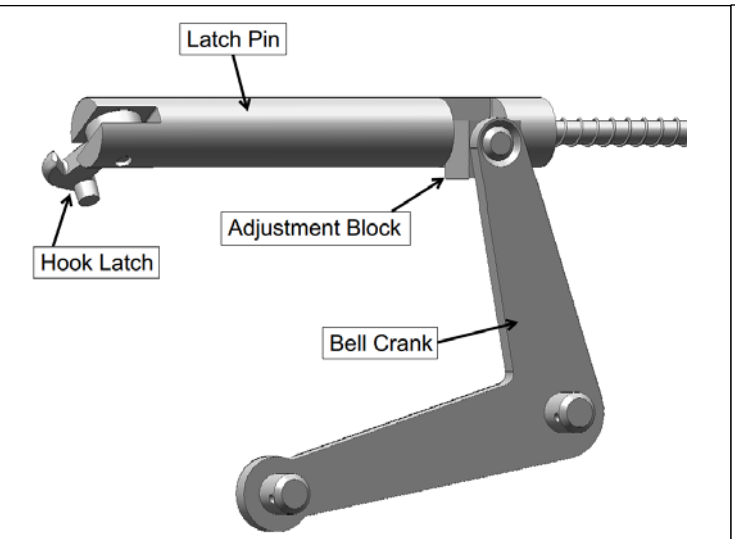
Figure 13

Figure 13: identification of Connecting Interlock mechanical components.

Figures 14 and 14A: details of Latch Pin, Hook Latch, Hook Latch Housing and Adjustment Block.

An Adjustment Block is mounted on the Bell Crank pin and engages the machined notch in the Latch Pin. Rotate Adjustment Block as required (used as an eccentric adjuster) to most completely engage the Latch Pin notch throughout the travel arc of the Bell Crank arm.

Note: the Bell Crank is secured to the rail web with machine bushings and cotter pins. Use machine bushings as required to space the Bell Crank so it does not “scrub” the face of the web during operation. Latch Pin is held in position by the Latch Pin Guide and a tab welded to the rail web for the tail of the latch. Adjustment Block “floats” on the Bell Crank pin and within the Latch Pin notch, and is captured on the Bell Crank pin by the rail web.



Details: Latch Pin, Adjustment Block, Hook Latch

Figure 14

The Hook Latch engages a drilled hole in the nose of the Crane Interlock Latch Pin (see Figure 6A) when the Crane Interlock Latch Pin enters the Latch Pin Guide of the Connecting Interlock. This locks the Crane Latch Pin to the Connecting Interlock Latch Pin and keeps the interlock assembly mechanically secure.

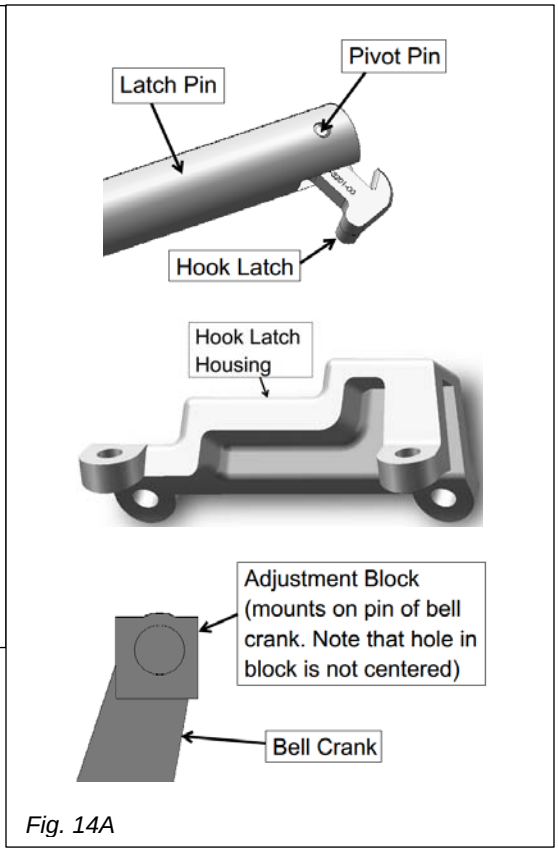
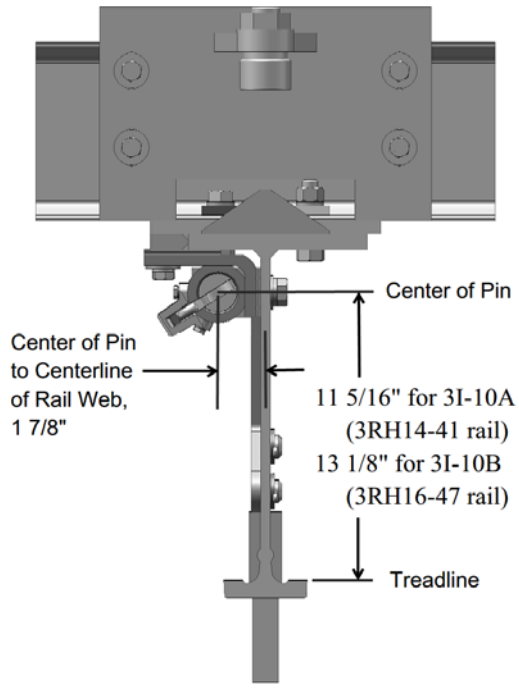


Fig. 14A

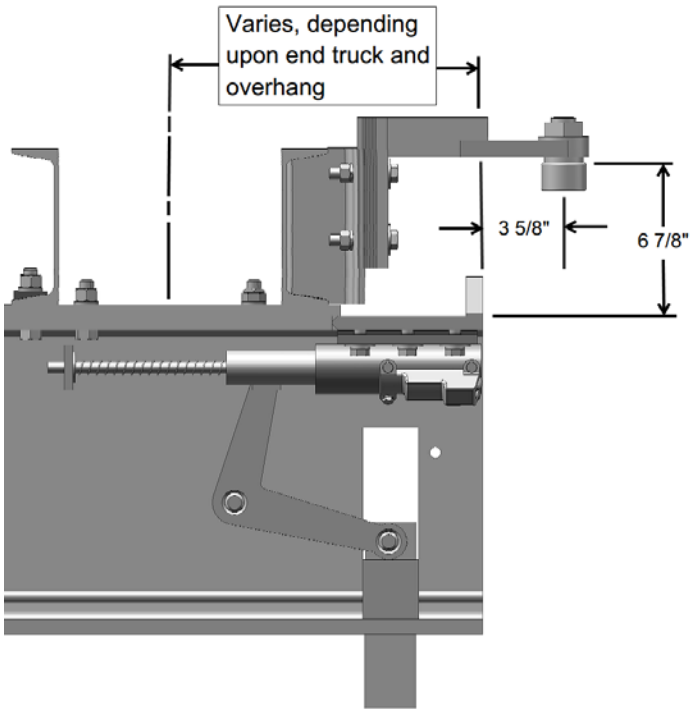
Figure 15: end view of Connecting Interlock, with design dimensions for location of the center of the latch pin. Adjust to dimensions with shims between the Latch Pin Guide and the top flange and web.

These dimensions must exactly match a similar pin location on the Crane Interlock (reference Figure 7).



Latch Pin Location

Figure 15

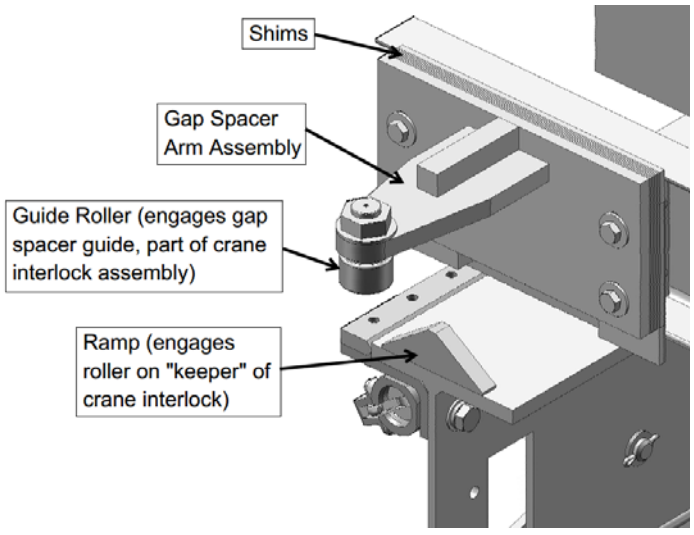


Gap Spacer Arm and Roller Location

Figure 16

Figure 16: side view of Connecting Interlock, with design dimension for location of the interlock Gap Spacer Arm. Adjust to 3 5/8" dimension with shims between the arm and the mounting brackets on the end truck frame a Spur Support Bracket (crane assembly is shown). Compare to Crane Interlock Gap Spacer Guide, see Figure 8.

Adjust to 6 7/8" dimension via slots in mounting plate of Gap Spacer Arm. Compare to similar dimension for Gap Spacer Guide, see Figure 8.



Details, Gap Spacer and Keeper Ramp

Figure 17

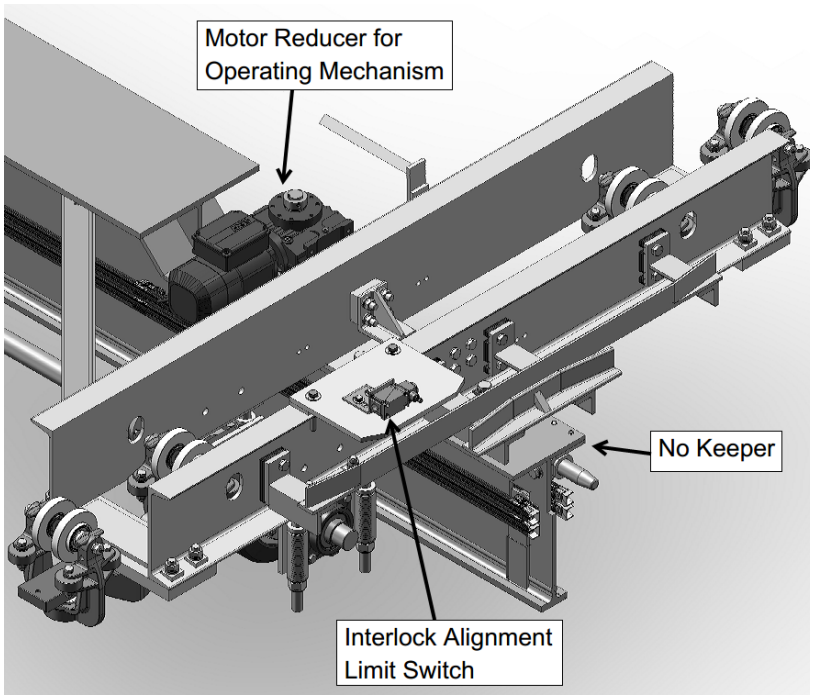
Figure 17: view of gap spacer arm assembly, with shims for adjustment to 3 5/8" dimension, as shown in Figure 16, to the end of the rail. Also, view of the ramp (welded to top flange) that contacts a roller on the "keeper assembly" of the Crane Interlock. The ramp raises the keeper to expose the crane interlock latch pin and allow the crane interlock to be actuated. See Figure 2.

Motorized Interlock

3I-9A and 3I-9B Crane interlocks may be provided with an optional motorized operating mechanism. The manual operating mechanism is replaced with a motor and reducer assembly driving a special Crank assembly. See Figures 18, 19 and 20.

Figures 18 and 19: typical 3I-9A Crane Interlock with optional Motorized Operating Mechanism.

Figure 20: view of the crank arm and linkage of a motorized operating mechanism (with bridge beam deleted for clarity). The limit switch and crank cam control the motor and reducer motion (rotation clockwise and counterclockwise) to extend or retract the latch pin.



Typical 3I-9 Motorized Crane Interlock

Figure 18

Motorized Operating Mechanism Limit Switch Adjustment:

See Figures 19 and 20. The limit switch is a lever operated, spring-return-to-neutral switch. The switch is mounted on the motor base plate with the centerline of the switch shaft in line with the center of the gearbox output shaft. With the switch in the neutral position, install lever on the switch shaft so the lever is pointed at the gearbox output shaft. Adjust length of the limit switch arm as required to contact the faces of the cam so as to fully extend or retract the latch pin when the motor operates. Motion of the gearbox should stop so the end of the latch pin is flush with the end of the latch pin guide when retracted, and project 3 5/8" beyond the end of the bridge when extended. Note: the crank arm pivots toward the web of the rail during operation. Verify phasing for correct motor rotation.

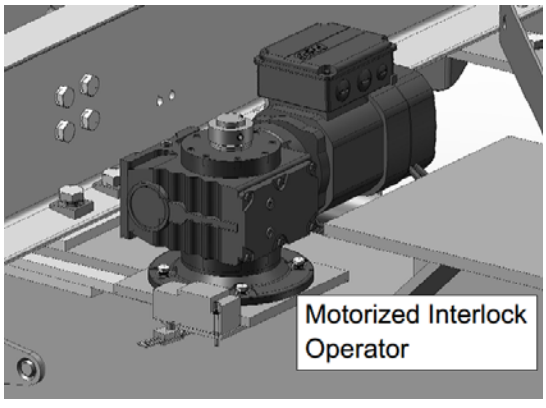
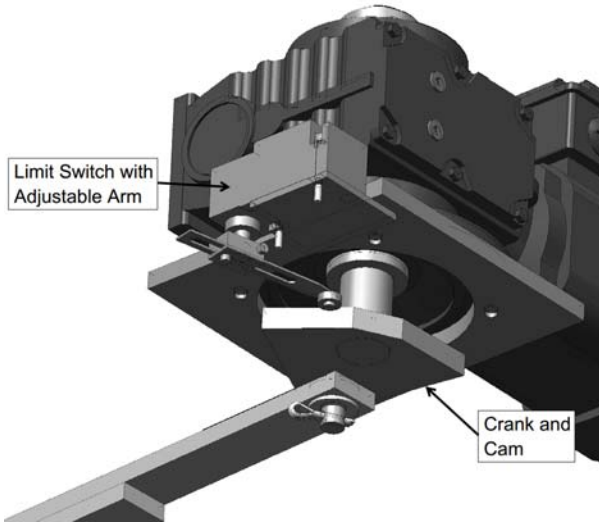


Figure 19



Typical 3I-9 Motorized Crane Interlock
(rail section removed for clarity)

Figure 20

Included with the motorized interlock operation option are a limit switch, alignment trip arm, and indicator lights to show crane to spur rail alignment.

Indicator lights are typically provided to show when the crane bridge rail is aligned with the spur rail, when the interlock is fully engaged, and when the interlock is fully disengaged.

Light colors are typically as follows:

- Red: Crane Interlock stop is down and interlock is not engaged (latched). This is the normal condition during crane movement.
- Amber: Interlock is aligned with a spur rail or another crane bridge (interlock operation can proceed).
- Green: Crane Interlock and Connecting Interlock stops are raised and transfer of the carrier may proceed.

Note: Motorized operator can only be actuated (via pendant station or other controller) when the crane is aligned to a connecting interlock.

The signal lights and circuitry to allow interlock operation are part of the wiring schematic for the Crane Alignment Limit Switch and the Motorized Operator Limit Switch.

Figure 21: view of crane alignment limit switch (also see Figure 18).

Figure 22: overhead view of typical crane and spur rail in alignment. Roller on gap spacer arm is engaged with the gap spacer guide. Alignment trip arm has contacted the alignment limit switch to illuminate a signal light to show “Crane Aligned” (signal lights not shown).

See the crane mechanical and electrical drawings for component part numbers and electrical schematics.

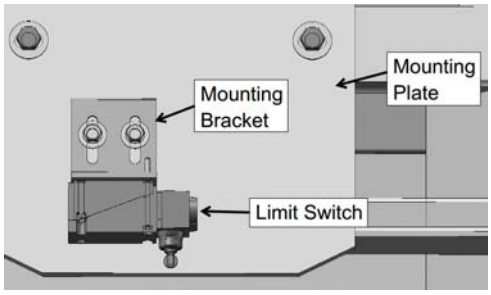
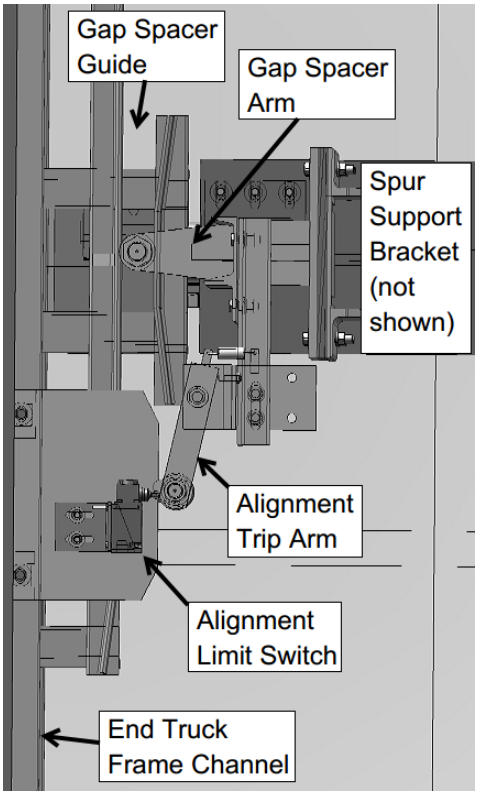


Figure 21



Typical Crane to Spur Alignment

Figure 22

Interlock Adjustments

Factory installed Crane and Connecting Interlocks should be properly adjusted as received. However, prior to initial operation and after any maintenance or repair, check the following items and adjust as noted. Before making any adjustments, verify that all parts are installed correctly and are not worn.

Note: all references in this document to design, features or adjustments for a 3I-9A or 3I-10A are also applicable to a 3I-9B or 3I-10B.

A. Treadline to Treadline Alignment

See Page 12 for a description of Spur Rail-to-Crane Bridge treadline adjustment. Similar procedure for crane to crossover treadline adjustment. Also see a separate document, *Monorail and Runway Rail Installation Instructions*.

Crane-to-Crane treadline alignment should be within factory manufacturing tolerances. Adjustments may also be made by adding or removing shims between the end truck frame and the top flange of the bridge beam.

B. Gap Between End of Bridge Beam to End of Spur Rail (or Bridge Beam to Bridge Beam)

Adjust Gap Spacer Arm and Roller assembly as shown in Figure 16. Adjust Gap Spacer Guide assembly as shown in Figure 8. See the minimum/maximum Gap Clearance Notes on Page 6.

C. Latch Pin, Crane Interlock

The Crank Arm, see Figure 6, consists of two segments, shop welded together at crane assembly. Verify that the nose of the Latch Pin is flush with the end of the Latch Pin Guide when the Operating Mechanism Crank is fully retracted. When the crank is fully extended, the nose of the Latch Pin must project 3 5/8” beyond the end of the bridge beam (to fully actuate the Connecting Interlock mechanism).

If the Crane Latch Pin is not flush with the end of the Latch Pin Guide when retracted, or if it does not extend properly past the bridge beam when extended, verify that Operating Mechanism is operating properly, with the Crank Arm properly positioned for full extension or retraction. Verify that Crank Arm is welded to proper length.

D. Adjustment Block, Crane and Connecting Interlock Latch Pins

Position the Adjustment Block on the pin of the Bell Crank of both the Crane and Connecting Interlocks so the adjustment block engages the machined notch in the Latch Pin most completely throughout the travel arc of the Bell Crank as it pivots. See Figures 6A and 14A.

E. Latch Pin Location

Verify location dimensions for the Crane and Connecting Interlock Latch Pin are correct. See Figures 7 and 15. Adjust as required by adding or removing shims. Note: in a system with multiple interlock points, verify that all latch pin locations are correct.

F. Motorized Interlock, Operating Mechanism Travel Limit Switch

See Page 16, Figures 19 and 20, for installation and adjustment of the travel limit switch and arm.

G. Motorized Interlock, Crane Alignment Limit Switch

See Figures 21 and 22. Adjust the position of the Limit Switch and the Trip Arm to properly actuate the limit switch when it contacts the trip arm.

Lubrication

General Lubrication Information

Figures 23 and 24: work a small amount of grease or light machine oil into the following areas as appropriate (see Figures 4, 5, 6, 12, 13 and 14 for parts identification):

1. Interlock Arm and Lever Mechanisms
   a) connecting interlock – pivot points where the bell crank arm is fastened to the rail web, the safety stop, and the latch pin
   b) crane interlock – pivot points where stop lever and bell crane arms are fastened to the rail web, the safety stop, and the latch pin
   c) crane interlock – where the bell crank engages the stop lever
2. Interlock Latch Pins – both crane and connecting interlocks
   a) inside of the latch pin guide (receiver barrel)
   b) body of latch pin where it slides into the guide
   c) adjusting block at bell crank connection
   d) connecting interlock – tail of latch pin where it slides through the support tab welded to the rail web
   e) connecting interlock – hook latch, pivot point connection to end of latch pin (verify inside of hook latch housing is clear)
3. Safety Stop and Guide Tubes – both crane and connecting interlocks
   a) inside of the safety stop guide tubes
   b) surface of safety stop where it slides through guide tube
   c) pivot connection to bell crank or lever
4. Operating Mechanism
   a) Manual – light oil where crank arm is installed in hole through the mounting plate and top flange of rail
   b) Motorized – gear box assembly, lubricate per vendor instructions

Lubrication Frequency

Recommended approximately each 6 months for normal operation, more frequently for heavy useage. Each application must be evaluated on its own merits, including: service duty, number of operations per shift, and operating environment.

Maintenance personnel should develop and maintain a record of all monthly inspections. Frequency of lubrication may be adjusted to match operational demands, based upon inspection reports.

Recommended Interlock Lubricants

(for standard industrial operating environments)

Interlock Arm Mechanisms	Good grade multi-purpose lithium grease
Latch Pins	Good grade multi-purpose lithium grease
Safety Stop and Guide Tubes	Good grade multi-purpose lithium grease
Pivot Points	Good grade light machine oil
Motor and Reducer for Motorized Interlock	See vendor manuals for motor and gearbox

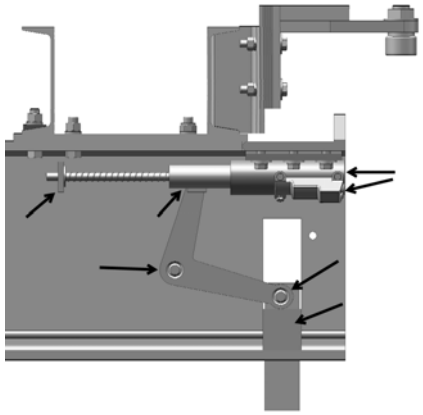
Note: TC/American Crane does not normally make a ‘brand name” recommendation for lubricants. Each customer may have a preference based upon many legitimate reasons. TC/A recommends to use a “good quality” lubricant and, when one is chosen, not to mix them.

Adjust lubrication type and frequency based upon the operating environment and customer requirements.

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).

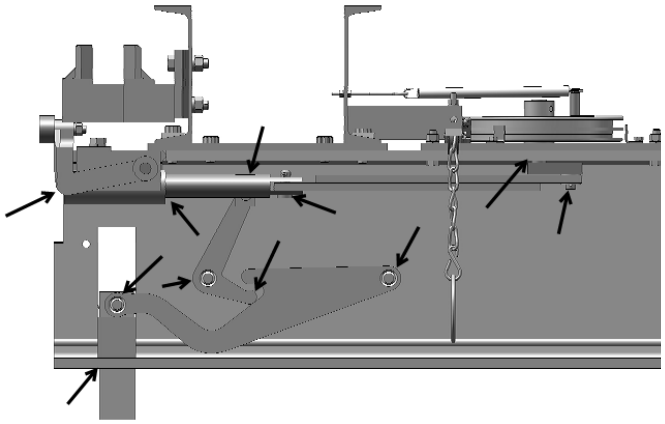
NOTE: have Material Safety Data Sheet (MSDS) info available for any lubricants brought onto a work site.

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



Typical 3I-10 Connecting Interlock Lubrication Points

Figure 23



Typical 3I-9 Crane Interlock Lubrication Points
(manual operating mechanism shown)

Figure 24