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Glide Switches
2000 Series

These instructions are for our 2000 Series Glide Switches product line, as used with TC/American Crane 325 Series Patented Track rail. See the Index to locate the appropriate pages for the model of switch being used.

⚠ DANGER

Lifting Operations

Installation of equipment such as TC/American Crane's Switches 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

Overhead Mechanical Assembly

Persons performing installation and assembly of overhead equipment must use caution while lifting, assembling and adjusting components. These operations are frequently conducted from manlifts or platforms that require specific knowledge, training and operation skills beyond the scope of this document.

Access to the floor below the work area must be restricted to reduce the potential of personnel injury due to falling objects.

Workplace supervisors are responsible to assure that all persons under their supervision are properly trained, properly equipped, and are following appropriate safety practices.

⚠ 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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Switches

TC/American Crane offers several models of switches, for all models and sizes of our rail. Selection of the appropriate model depends upon the layout of the monorail, the load to be carried, powered travel or hand pushed, service duty class, and other factors.

Switch Model Numbers:
(general information for all switches)

- The first character(s) of the Model Number identifies the rail size used with this switch:
  - 2 = 200 Series Rail
  - 3 = 325 Series Rail
  - 4 = 400 Series Rail
  - 45 = 450 Series Rail
- The second character(s):
  - S = Switch, non-electrified (without conductor bars)
  - ES = Switch, electrified (with conductor bars)
- The intermediate numbers identify a model series, i.e.:
  - 260 = 200 Series, 2-way glide switch
  - 693 = 600 Series, 2-way glide switch
  - 833 = 800 Series, 3-way glide switch
  - 2710 = 2000 Series, Wye glide switch
  - Etc.
- The next number, or number and letters, may identify the switch as follows:
  - L = Left Hand configuration (or sometimes “LH”)
  - R = Right Hand configuration (or sometimes “RH”)
  - Y = Wye configuration
  - H = “H” Series rail (in 800 and 2000 Series Switches, 3-way and wye configurations)
  - LH = “H” Series rail (in 800 and 2000 Series Switches, 2-way configurations, left hand)
  - RH = “H” Series rail (in 800 and 2000 Series Switches, 2-way configurations, right hand)
  - 12 = 12” (for 2000 Series only)
  - 12H = 12” deep, “H” Series rail (for 2000 Series only)
  - 14H = 14” deep, “H” Series rail (for 2000 Series only)
  - Etc.

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

NOTE: For a specific parts breakdown of the Switch provided with an order, see the drawings provided with that shipment and the Switch Section of TC/American Crane Systems Catalog.

NOTE: These are general installation instructions and may not address custom built options or modifications that may have been ordered as part of the factory built equipment.

General Installation Instructions

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.
- Store all equipment in a clean, secure area prior to final assembly.

Installing Switches in a Monorail System:

- Check layout drawings for any notes.
- TC/American Crane Glide Switches are shipped fully assembled and ready to install.
- Begin a monorail installation at one switch location (determine if a particular switch is at a critical location) and work out from there, adding straight rails and curves sequentially.
- Refer to *Suspension* section of this document for notes about primary and auxiliary suspension methods. Use care when installing and leveling switches so that switches are uniformly and equally suspended, with no twisting of the switch frame.
- Switches must be installed in alignment with the planned monorail layout. Establish a reference line for the system and take dimensions from there, rather than the building (building may not be accurate and square). Adjust switch suspension so the straight rail of the inner frame (or the centerline of a Wye switch) is aligned with the centerline of the incoming and/or outgoing straight rails.
- If there is more than one switch in a system, add the second and additional switches as the installation progresses. Do not install all switches and then try to force rails into place between them.
- Install all switches, curves and rails snug until all is in place. Then shift and adjust as necessary to assure that straight rails enter and exit the switch straight, and that curves are properly formed and flow smoothly from the switch. See *Treadline and Rail Alignment Adjustment Notes* section of this document.
- Make any adjustments for switch rail height, switch throw and tread alignment. See *Switch Adjustments* section of this document. Adjustments and shimming are a necessary part of normal installations.
- For switches with electric or air operating mechanisms, see the separate *Air Operated Switch Installation Instructions* or *Electric Operated Switch Installation Instructions*.
- Make any final switch leveling adjustments (adjust nuts on threaded rods, or use shims at bolted connections). Use care when installing and leveling switches so that switches are uniformly and equally suspended, with no twisting of the top plate or slide channels of the switch.
- Tighten all suspension components.
- Rod suspended switches must be rigidly sway braced for stability. Sway brace materials are by others.

Initial Start-Up:

- After lubrication, operate all switches several times through full switch throw in all directions.
- Verify proper latching at each outgoing rail or curve location.
- Run trolleys through the switches to check clearances and smooth transition.
- Verify that safety stops on the switch properly contact the trolley to prevent it from falling off when the switch rail is not aligned to an outgoing rail.
- NOTE: These switches are not designed to be thrown (moving portion of the switch repositioned) with a load on the rail of the inner frame.

Terminology Notes

The following instructions use these unique terms:

- “Outer Frame” - describes the portion of the switch that is suspended from the building, and is the “fixed” or “non-moving” portion of the switch.
- “Inner Frame” - describes the portion of the switch with straight and curved rail segments that slide from side to side.
- “Right Hand” or “Left Hand” references are based upon looking at the switch from the incoming rail side (single rail leading to the switch).

2000 Series Glide Switches

Non-Electrified
(with 3RL13-22 rail on the inner frame)

3S-2690-R12	2-way,RH	Not Shown
3S-2690-L12	2-way,LH	Not Shown
3S-2700-12	3-way	Not Shown
3S-2710-12	Wye	Not Shown

Non-Electrified
(with 3RH13-30 rail on the inner frame)

3S-2690-R12H	2-way,RH	Not Shown
3S-2690-L12H	2-way,LH	Not Shown
3S-2700-12H	3-way	Not Shown
3S-2710-12H	Wye	Not Shown

Non-Electrified
(with 3RH14-33 rail on the inner frame)

3S-2690-R14H	2-way,RH	Not Shown
3S-2690-L14H	2-way,LH	Not Shown
3S-2700-14H	3-way	Not Shown
3S-2710-14H	Wye	Not Shown

Electrified
(with 3RL13-22 rail on the inner frame)

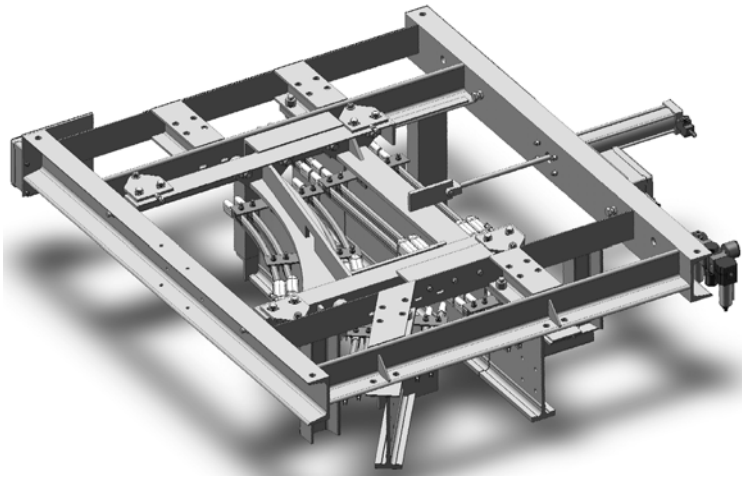
3ES-2690-R12	2-way,RH	Not Shown
3ES-2690-L12	2-way,LH	Not Shown
3ES-2700-12	3-way	Not Shown
3ES-2710-12	Wye	Not Shown

Electrified
(with 3RH13-30 rail on the inner frame)

3ES-2690-R12H	2-way,RH	Not Shown
3ES-2690-L12H	2-way,LH	Not Shown
3ES-2700-12H	3-way	Not Shown
3ES-2710-12H	Wye	Not Shown

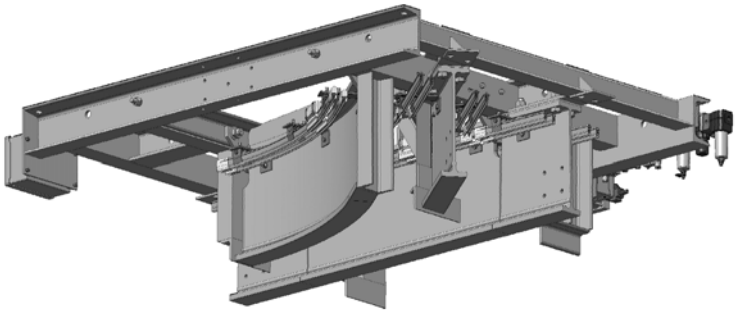
Electrified
(with 3RH14-33 rail on the inner frame)

3ES-2690-R14H	2-way,RH	Figs. 1 & 2
3ES-2690-L14H	2-way,LH	Figs. 3 & 4
3ES-2700-14H	3-way	Not Shown
3ES-2710-14H	Wye	Not Shown



3ES-2690-R14H, 2-Way Right Hand Glide Switch
(shown with Figure-8 Bottom Contact electrical conductors and Air Operation for switch movement)

Figure 1



3ES-2690-R14H, 2-Way Right Hand Glide Switch
(shown with Figure-8 Bottom Contact electrical conductors and Air Operation for switch movement)

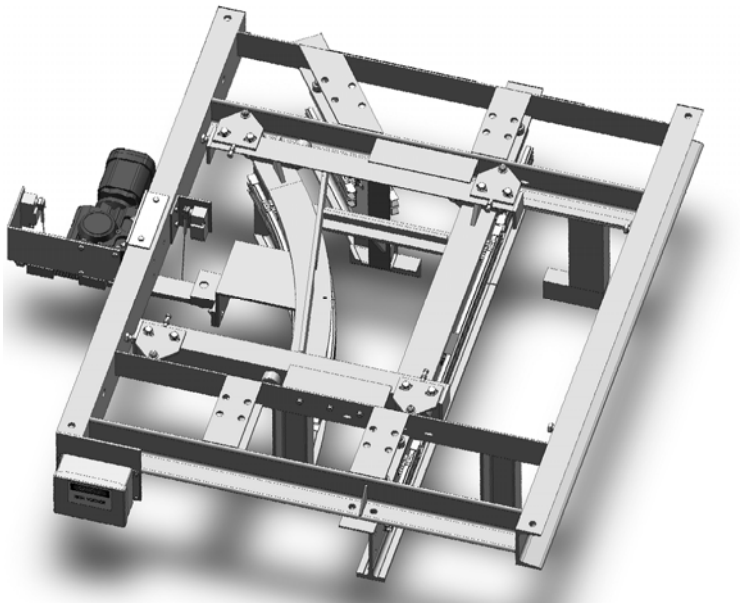
Figure 2

Figure 1: Top view, 2000 Series 2-Way, Right Hand Glide Switch with Figure-8, Bottom Contact conductor bar. Shown with air operating mechanism with push button station, provided in place of standard manual operation with pull chain.

Figure 2: Lower view of 2000 Series 2-Way, Right Hand Glide Switch. Note the “stub rail” design (12” length of rail at incoming and outgoing rails), typical for all 2000 Series switches. Switch frame is supported from overhead steel at four locations; incoming and outgoing rails are supported from outer frame of switch; incoming and outgoing rails are spliced to stub rails.

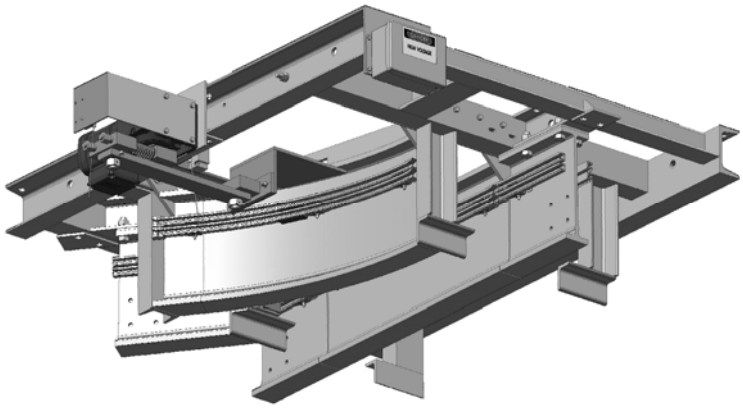
Figure 3: Top view, 2000 Series 2-Way, Left Hand Glide Switch with Shielded Channel-Bar, Side Contact conductor bar. Electric motor operating mechanism, with push button station, provided in place of standard manual operation with pull chain.

Figure 4: Lower view of 2000 Series 2-Way, Left Hand Glide Switch. Note the motorized operating mechanism linkage for repositioning inner frame of switch.



3ES-2690-L14H, 2-Way Left Hand Glide Switch
(shown with Shielded Channel-Bar Side Contact conductors and Motorized Operation for switch movement)

Figure 3



3ES-2690-L14H, 2-Way Left Hand Glide Switch
(shown with Shielded Channel-Bar Side Contact conductors and Motorized Operation for switch movement)

Figure 4

Electrified vs. Non-Electrified Switches:

All 2000 Series switches may be provided with either Shielded Channel-Bar or Shielded Figure-8 Bar electrical conductors, in either Side Contact or Bottom Contact configuration. Switches using 3RH14-33 rail may be provided with Side and Bottom Contact conductors on the same switch,

General construction, installation, operation and adjustment are the same for both types of switches.

Non-electrified 2000 Series Glide Switches are manufactured without conductor bar mounting holes in the web of the rail on the inner frame. Electrified 2000 Series Glide Switches have electrical conductor bar and wiring harness provided and mounted.

Switches with 3RL13-22 or 3RH13-30 rail have side contact conductor bars at 7½" gauge. Switches with 3RH14-33 rail have side contact bars at 9" gauge.

For more detail, see the TC/American Crane Systems Catalog and drawings provided with the shipment.

Conductor bars: are factory wired to a junction box mounted on the outer frame of the switch. Building power must be provided to each switch and field connected at the junction box. Building power must be separately provided to incoming and outgoing runs of electrified straight and curved rails. See Figures 24, 25, 26 and 27 for typical wiring harnesses. See Figure 28 for an example of a wiring harness for a switch with both Side and Bottom Contact conductor bars.

For installation of electrical conductor bar systems, see the TC/American Crane *Shielded Channel-Bar Electrical Conductor Installation Instructions* or *Shielded Figure-8 Electrical Conductor Installation Instructions*.

Switch Support / Suspension

Locations, see Figures 5, 7 and 8:

2000 Series Glide Switches must be attached to overhead support structure as follows:

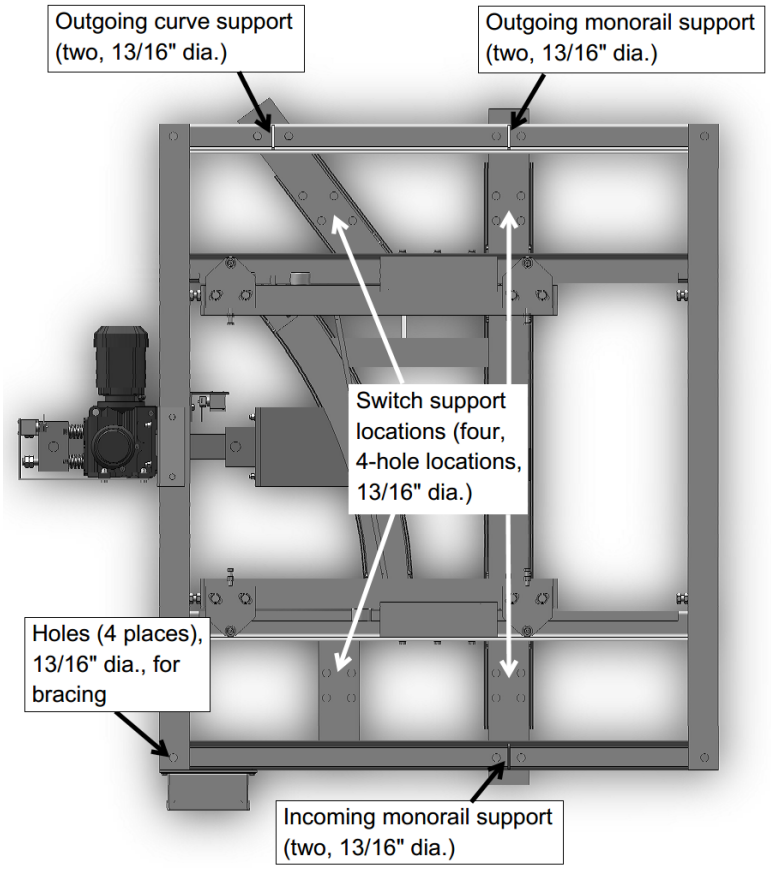
- 2-Way - four locations
- Wye - five locations
- 3-Way - six locations

Use 3/4” hanger rods or bolts at 4-bolt patterns at each suspension point. See TC/A Systems Catalog for hole layout dimensions.

Note: all suspension hardware is by others.

See Figures 9 and 10 for typical detail view of support holes.

Use care so the switch frame is level and equally supported at each location, and the frame is not twisted or bent.



Switch Support Locations and Monorail Connections for 2-Way Switches

Figure 5

Monorail and Curve Connection to Switch: incoming straight section of rail and outgoing straight rail and curves are supported by the outer frame of 2000 Series switches at the locations shown in Figures 5, 7 and 8. These rail hanger points are independent of other monorail and switch support points or structures.

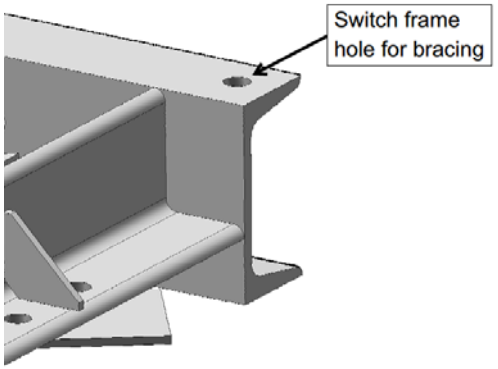
Leveling, All Switches: allow space above switch for leveling via threaded hanger rods, or by shims if bolted connection.

Switch Bracing: rod suspended switches must be sway braced, laterally and longitudinally. Sway brace materials are by others. Switches supported by other methods may need to be braced, depending upon the type of support.

Attach bracing to switch at the 4 holes (13/16”) in the outer frame of each switch, as shown in Figures 5, 7 and 8. See hole detail in Figure 6. Use care so the switch frame is equally braced at each location and the frame is not twisted or bent.

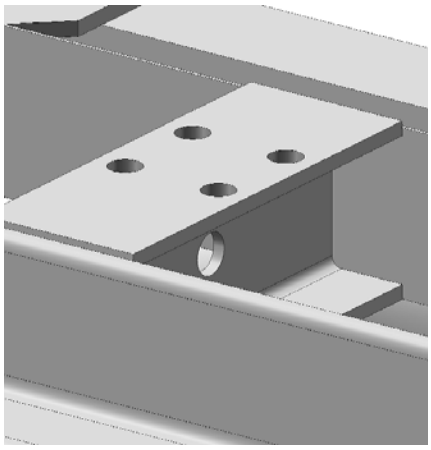
Monorail and switches must be aligned and leveled before bracing is installed. Do use bracing to force the rail or switch into alignment. Bracing must not carry any of the vertical load at a suspension point.

See Suspension section of TC/American Crane systems catalog for pipe brace fittings and clamps, or fabricate components locally.



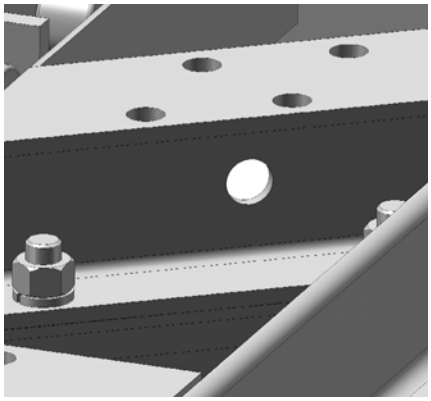
Detail, Typical Hole for Switch Bracing

Figure 6



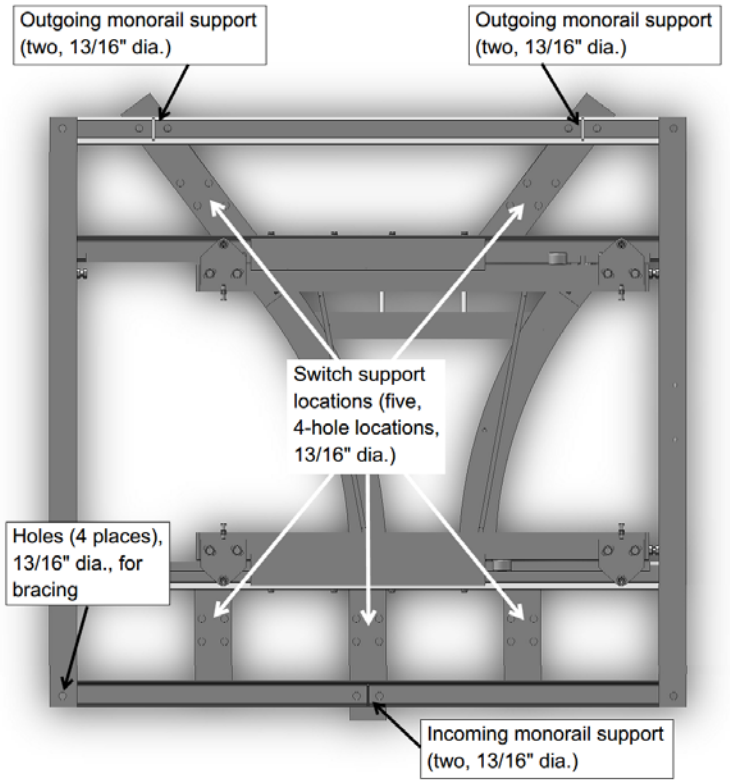
Typical Switch Support Holes at Other Than Outgoing Curve

Figure 9



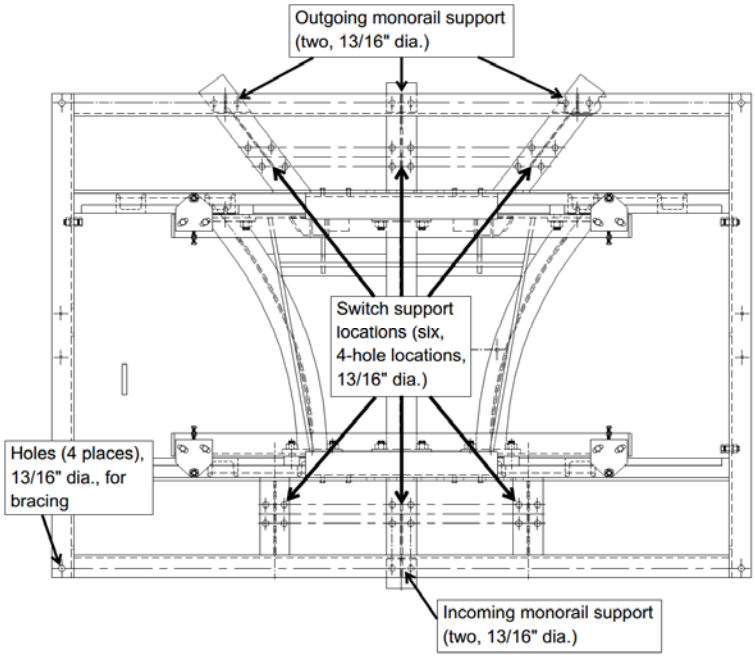
Typical Switch Support Holes at Outgoing Curve

Figure 10



Switch Support Locations and Monorail Connections for Wye Switches

Figure 7



Switch Support Locations and Monorail Connections for 3-Way Switches

Figure 8

Monorail and Curve Connection to Switches

Figure 11: typical connection of straight monorail to outer frame of 2000 Series glide switch.

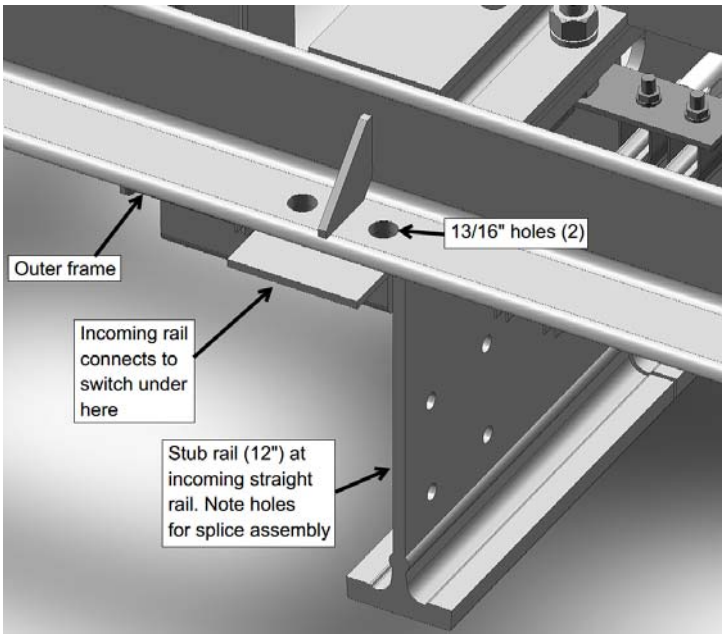
Figure 12: typical connection of outgoing straight and curved monorails to outer frame of 2000 Series glide switch.

Note: Rail connection hardware is not shown. All provided by others.

Incoming and Outgoing Rail and Curve End Preparations: 2000 Series switches are provided with “stub rails” at each of the incoming and outgoing rails. The ends of all incoming and outgoing straight and curved rails need only to have a standard splice assembly preparation.

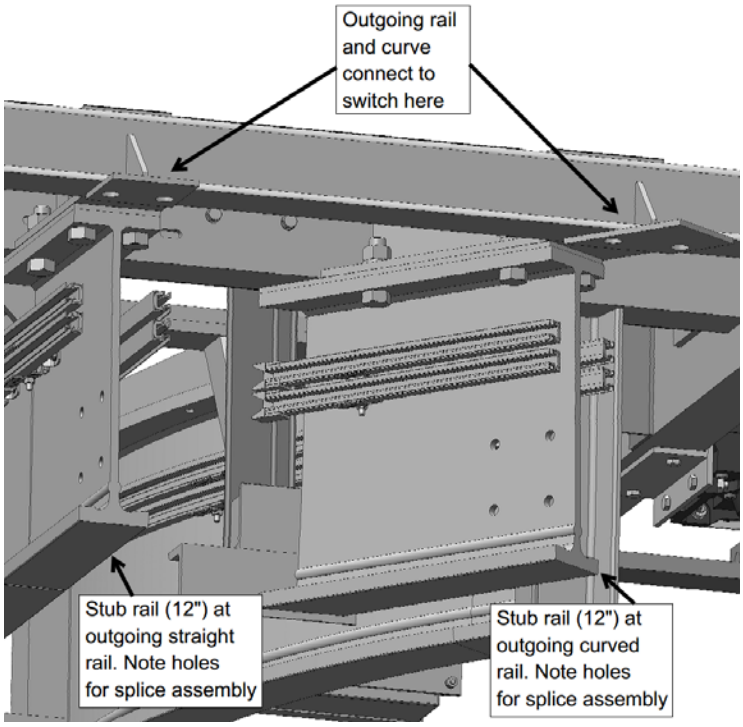
Step Cutting or Notching of Incoming and Outgoing Straight and Curved Rails: If the incoming or outgoing rails are deeper than the stub rails (sometimes required to meet ECL), they must be “step cut” or “notched” as required (see Figure 13, typical).

Note: for Equivalent Center Load (ECL) and calculations, see the Rail Section and the Engineering Section of the TC/American Crane Systems Catalog.



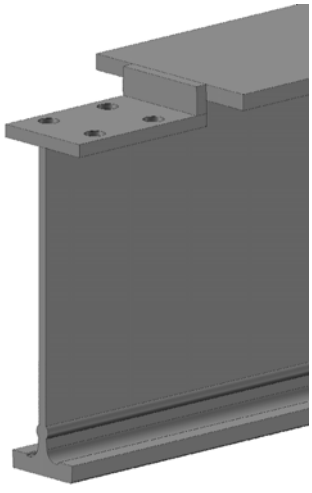
Typical Incoming Monorail Connection to Switch, 3S-2690-R12 shown

Figure 11



Typical Outgoing Monorail Connections to Switch, 3ES-2690-L12 shown

Figure 12



Typical Rail Step Cut or Notch

Figure 13

Switch Latching and Operating Mechanisms

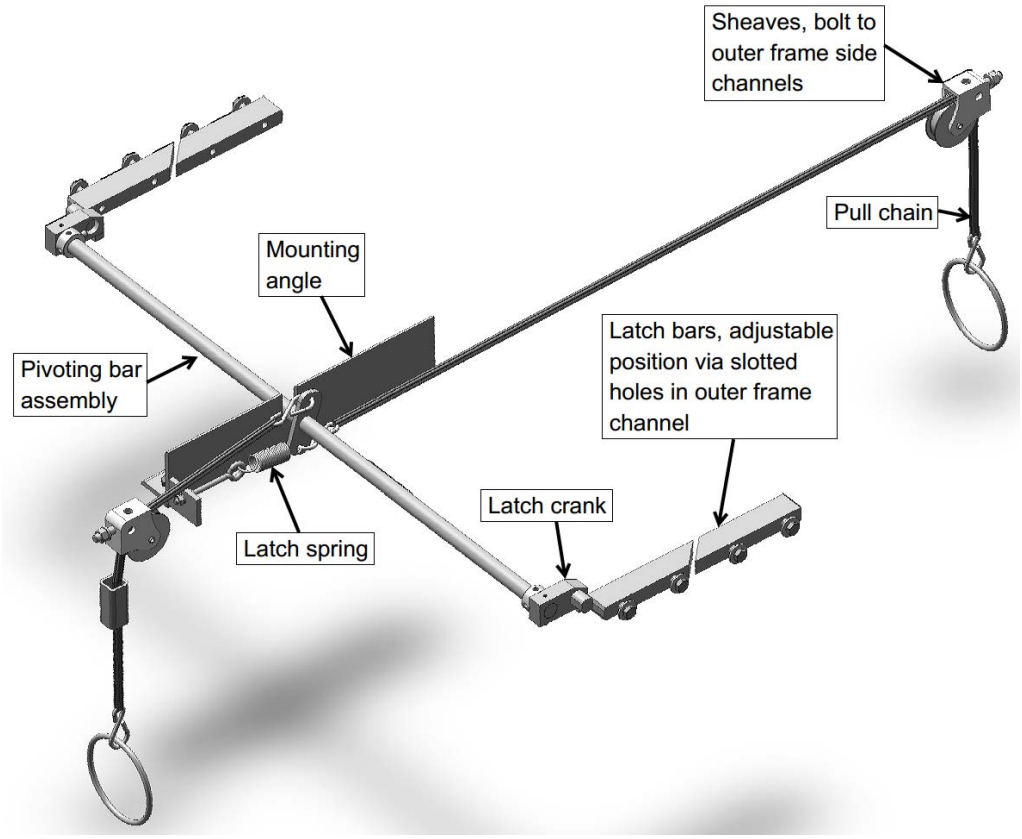
2000 Series Glide Switches may be operated (unlatched, moved and re-latched) by either a manual pull chain device, a motorized operating mechanism, or by an air cylinder.

Manual operation:

For 2-Way RH and LH, and Wye Switches: (see Figures 13 and 14). The inner frame of the switch is repositioned by pulling the ring and chain assembly on the side of the switch to which you want the inner frame to move. Each chain hangs down approximately 12' long and is routed from the latch crank pivot bar through sheaves mounted on the outer frame. Chain length may be adjusted as needed to meet the height and layout of the monorail system (by others, unless special ordered). Additional sheaves may be furnished locally to route the chains as required.

Pulling the chain turns the pivoting bar assembly and rotates the latch cranks upward to disengage the latch crank pins from behind the end of the latch bars (locked position). See Figure 14.

Continued pull on the chain moves the inner frame in the direction of pull until the frame contacts the stop bolts (see Figures 5, 7, 8 and 19). Releasing pressure on the chain allows the latch spring to turn the pivoting bar assembly so the latch crane and pin drop into position at the other end of the latch bars and lock the switch into position. Switch operation is now complete and normal monorail use may proceed.



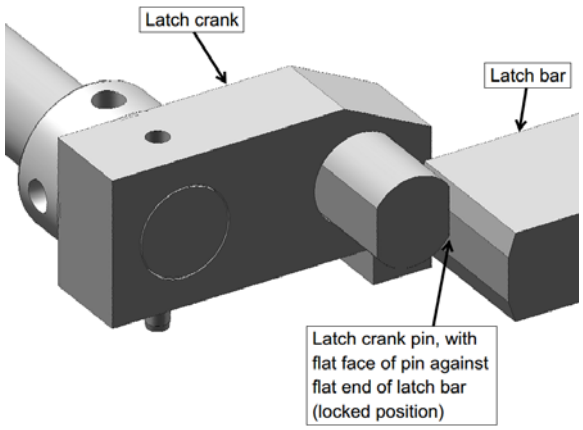
Typical Manual Operating Mechanism, with Pull Chains for RH, LH and Wye switches

Latch cranks shown in "locked" position

Figure 13

For 3-Way Glide Switches: (not shown). 2000 Series 3-Way switches have an additional set of Latch Bars mounted on the outer frame channel. The spacing between the first and second set provides a gap for the latch crank pin to drop into for alignment and locking at the center rail position. Operators of the switch will need to learn to “feel” the latch crank and pin slide along the top of the latch bar until it aligns with the gap between the latch bars for the center position.

Other sequences for operation of the 3-Way switch are similar to that of the 2-Way and Wye switches.



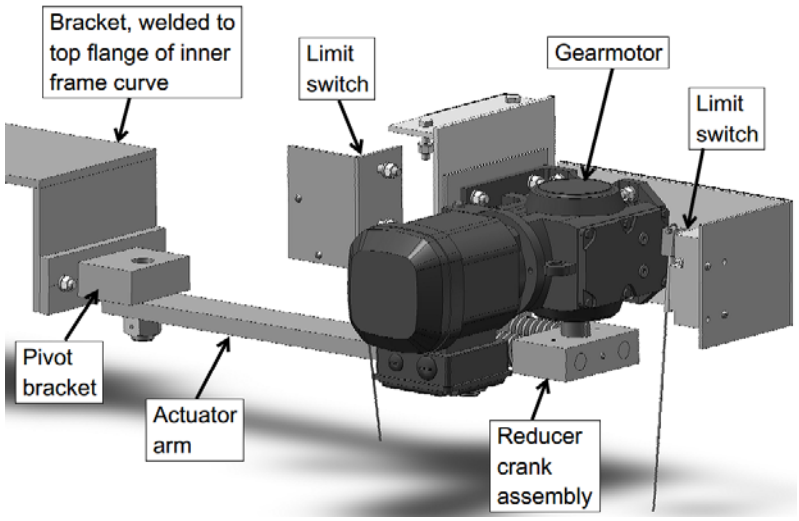
Detail of 2000 Series Latch Crank and Latch Bar

Figure 14

Electric Motor Operating Mechanism:

For 2-Way RH and LH, and Wye Switches: the inner frame of the switch is shifted left/right via a gearmotor (motor and gearbox assembly) and a crank arm assembly (see Figures 15 and 15A). Limit switches control the motor operation. The spring-loaded crank assembly holds the inner frame tightly against the stop bolts for alignment. All components are factory assembled and adjusted. Operated from a selector switch, which is shipped loose for field locating, wiring and mounting.

See drawings provided with the shipment.



Motor Operated Switch Mechanism

Figure 15

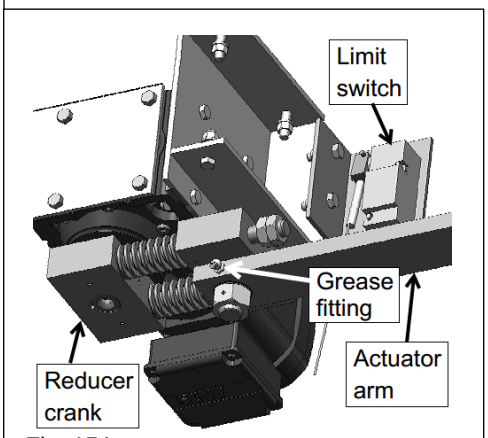


Fig. 15A

For 3-Way Switches: (not shown). Shifted with a linear actuator. Operated from a selector switch which is shipped loose for field locating, wiring and mounting.

See drawings provided with the shipment.

Air Operated Mechanism:

For 2-Way RH and LH, and Wye Switches: (see Figures 1, 2 and 16). Components factory assembled and mounted as shown. Pushbutton control shipped loose for field location and mounting.

Requires minimum 80 psi air source.

See drawings provided with the shipment.

For 3-Way Switches: (not shown). May be provided with dual cylinders or a two-position cylinder.

See drawings provided with the shipment.

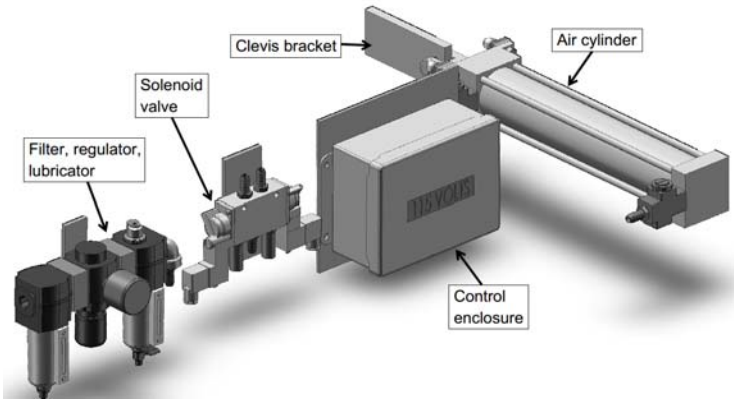


Figure 16

Glide Switch Adjustments

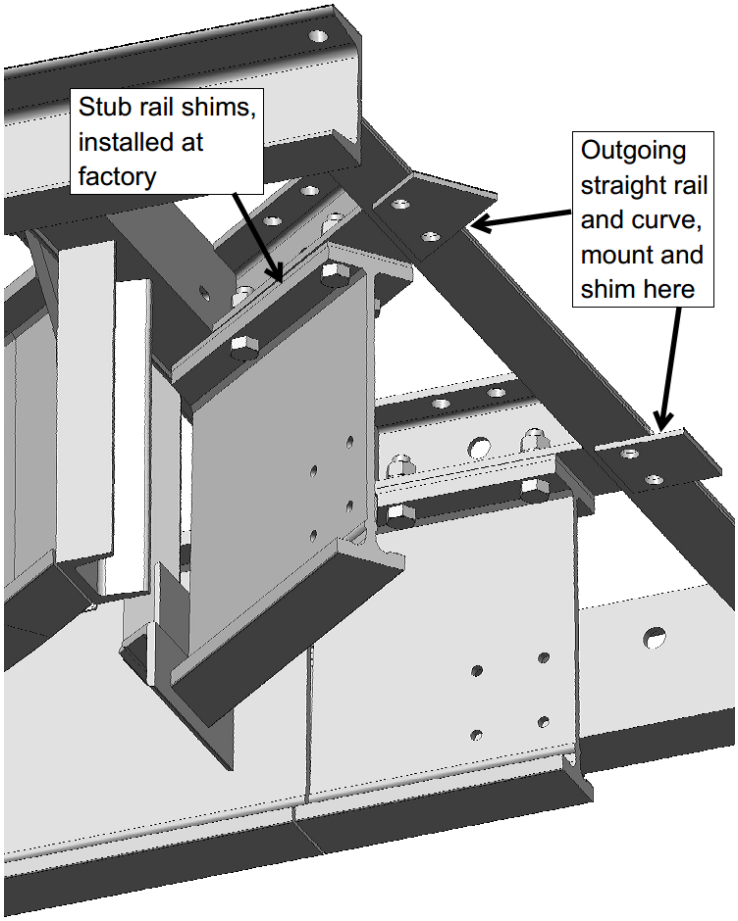
A. Inner Frame Rails to Stub Rails: See Figure 18. Switch stub rails are factory installed, aligned and shimmed to the inner frame rails before shipment. Field verify and make any adjustments before proceeding with incoming and outgoing rail and curve installations. Maximum gap between inner frame rails and stub rails is 1/8” at incoming and outgoing side of switch. Adjust via 13/16” holes in the switch frame angle vs. 3/4” diameter bolts, or enlarge holes. Also, check for proper adjustment of inner frame guide roller brackets.

B. Stub Rails to Incoming and Outgoing Rails and Curves:

Treadline alignment: adjust by shimming as required between the switch outer frame angle mount plate and top flange of rail (design allowance for ¼” of shimming). See Figure 18, typical for straight and curved rail. Support hardware not shown.

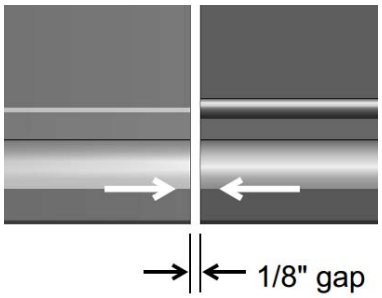
The riding tread (treadline) of the stub rails and the monorails or curves must be equal. Monorail beams can vary slightly in overall height, and the tee section thickness and width may also vary within tolerances. After shimming to best alignment, it is allowable to grind and feather very slightly at the adjoining rails to assure a smooth transition. Maximum gap between stub rail tee section and incoming or outgoing rail tee sections to be no greater than 1/16”. In extreme cases, it may be necessary to enlarge holes or slots in the monorail or curve top flange to bring the tee sections together.

Note: one 1/4” and four 16 gauge shims (see Figures 18A, curve shim, and 18B, straight shim) are provided with each switch for each hanger point. A properly shimmed rail results in the tee section aligned and level to the adjoining stub tee of the switch.



Typical Rail to Switch Shimming

Figure 18



Inner Frame Gap to Stub Rails and Treadline Alignment

Figure 17

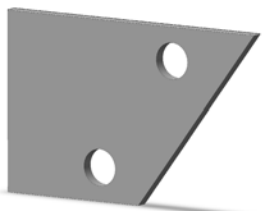


Fig. 18A

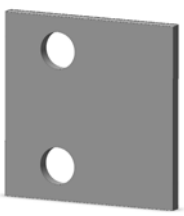


Fig. 18B

B. Glide Switch Throw

2-Way and Wye Switches:

Figure 19. Full throw to left and right is adjusted via stop bolts on the channels of the outer frame. The stop bolts contact stop brackets on the switch inner frame. When the switch is fully thrown, rail on the inner frame must be in line with the corresponding outgoing straight or curved rail, and the pins of the latch crank must be in place against the face of the latch bars (see Figure 13).

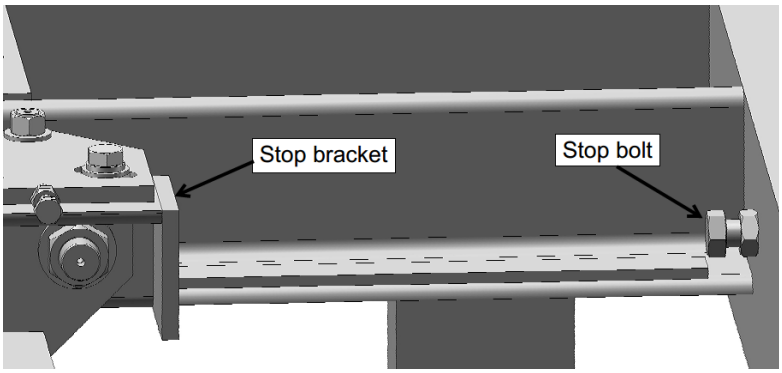


Figure 19

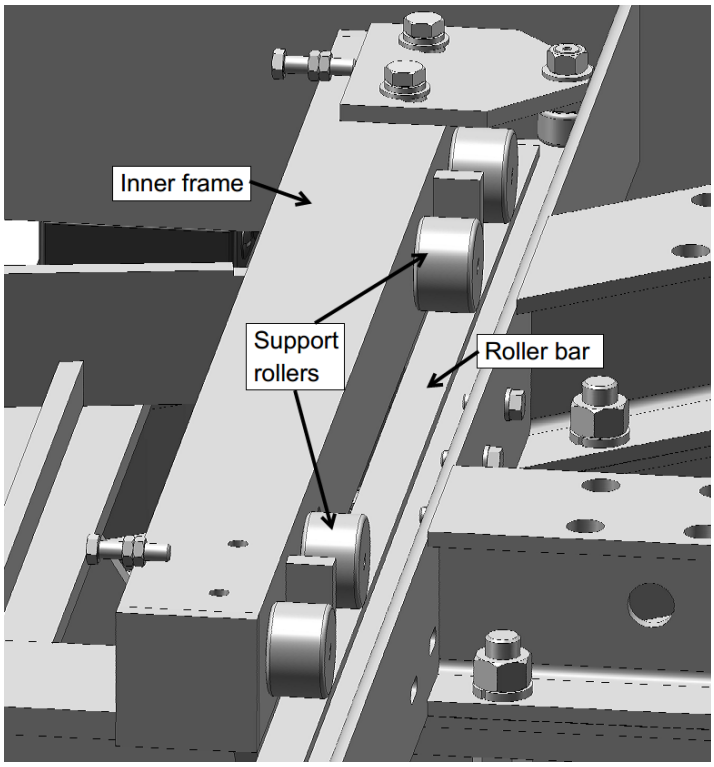
To adjust throw, loosen nut on stop bolt (see Figure 19) and position the inner frame fully left or right to align the corresponding rails. Adjust stop bolt to the stop bracket and tighten locking nut. Adjust latch bars (see Figures 13 and 14) up to the latch crank pin. Clearance between the face of the latch bar and the latch crank pin must be tight enough to hold the inner frame in position, but not so tight as to prevent the latch crank from pivoting.

3-Way Switches:

Same process for full left and right as described for 2-Way and Wye Switches. The center alignment is adjusted by the location of the second set of latch bars provided on a 3-Way switch. The spacing between the first and second set provides a gap for the latch crank pin to drop into for alignment and locking at the center rail position.

All Switches:

Operate switch through several cycles of movement to be sure the throw is properly adjusted and that the latch cranks and pins easily and positively engage to the latch bars.



Typical 2000 Series Switch Inner Frame Support (guide roller and anti-kickup angle removed for clarity) 2-Way, Left Hand shown

Figure 20

Inner Frame Support Rollers:

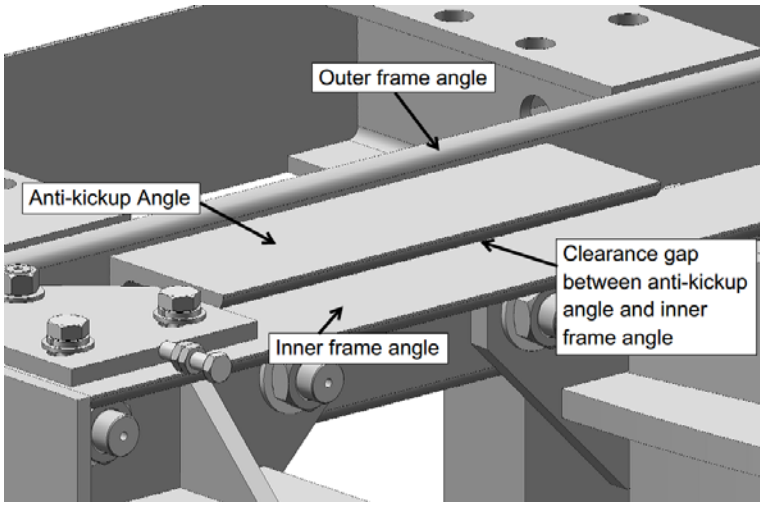
The inner frame of 2000 Series Glide Switches rides on a series of support rollers, as shown in Figure 20, at both the incoming and outgoing side of the switch. These rollers are not adjustable. Rollers ride on a roller bar which is welded to an angle of the outer frame. Assure that roller path is clean and clear.

C. Anti-Kickup Angles

Figures 1, 3 and 21: 2000 Series Glide Switches have Anti-kickup Angles bolted to the incoming and outgoing sides of the outer frame. These reach over the inner frame, as shown in Figure 21, and prevent the inner frame from tipping (kicking up) when a loaded trolley enters or exits the switch.

Anti-kickup angles are factory assembled to the switch frame and are not adjustable. Angles should just clear the top of the inner frame angles when the switch is not loaded. Approximate clearance between angle and inner frame is 1/16".

Verify clearance gap over full inner frame movement.



Anti-Kickup Angle

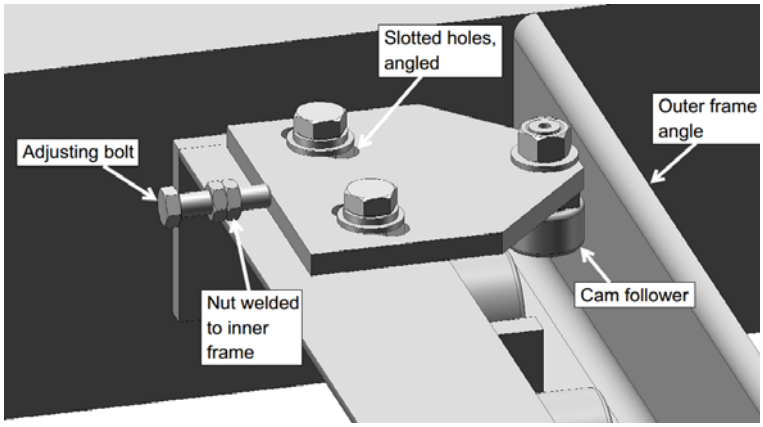
Figure 21

D. Inner Frame Guide Rollers

Figures 5, 7, 8 and 22: On all 2000 Series Glide Switches, a set of four Inner Frame Guide Rollers are used to guide the inner frame between the angles of the outer frame. Rollers should just brush against face of inner frame angle during throw of switch. If set too tight, the rollers may bind against the switch frame angle. If set too loose, the inner frame may not hold gap clearances between the inner frame rails and the stub rails, and it may "cock" in the outer frame, making operation difficult.

Guide rollers are used to:

- prevent the inner frame from "cocking" when the inner frame is moved
- adjust the inner frame rail to stub rail gap
- hold the inner frame in position when a loaded trolley passes through
- may slightly adjust alignment of inner frame rails to stub rails (see Notes for Treadline and Rail Alignment Adjustment).



Inner Frame Guide Rollers

Figure 22

Field adjustment (see Figure 22):

- Loosen and back off adjusting bolt
- Loosen cap screws just enough so the guide roller plate is free to move
- Center inner frame in switch gap, with incoming and outgoing rails aligned
- Use adjusting bolt to move and hold guide roller plate in position
- Tighten cap screws
- Tighten locking nut on adjusting bolt
- Operate switch through complete throw to verify clearances and smooth operation. Readjust if required.

Verify that roller paths are clean and clear.

E. Notes for Treadline and Rail Alignment Adjustment

Minor misalignment of the treadline and edges of the switch inner frame rail to the treadline and edges of the outgoing rail or curves may be caused by various manufacturing tolerances in fabrication of the rail or assembly of the switch, various switch adjustments, and proper alignment of the incoming and outgoing rails relative to the switch and general monorail layout. See Figure 23.

Satisfactory final adjustments and alignment must be considered to be the result of the fine art of installation.

For alignment, check the following:

- straight rail of the monorail system must leave the switch in a straight line along the monorail path. If switch is not suspended in line with the planned monorail path, or if the straight rail of the monorail enters or leaves the switch at an angle, the edges of the straight rail will not be aligned with the edges of the switch rail and may cause an excessive gap between rail ends.
- relocate or adjust suspension of the outgoing straight rail to hold it in proper alignment.
- verify that curved rails make a smooth transition from the switch to the monorail path. Relocate or adjust suspension of the outgoing curved rail to hold it in proper alignment.

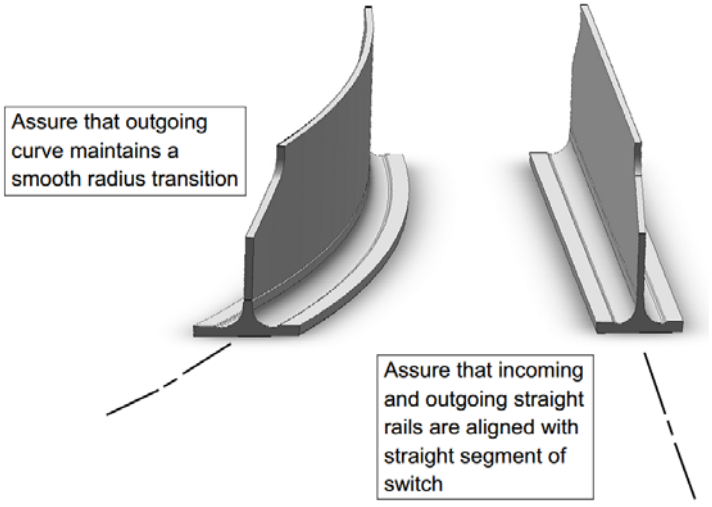


Figure 23

- Inner frame guide rollers may need to be adjusted to center the inner frame within the outer frame. Verify that inner frame rolls parallel to the outer frame throughout the full throw distance. See Figure 22.
- verify that the switch is supported securely, rigidly, aligned and level, whether by hanger rods, bolts or other support structure. Rod suspended systems (switches, curves and rail) must be braced to prevent movement. The monorail system must be fully aligned and leveled before installing bracing. The frame of the switch must not be twisted by unequal tightening of hanger rods, unequal shimming or a support structure that can flex. The switch must not be forced into position or alignment.

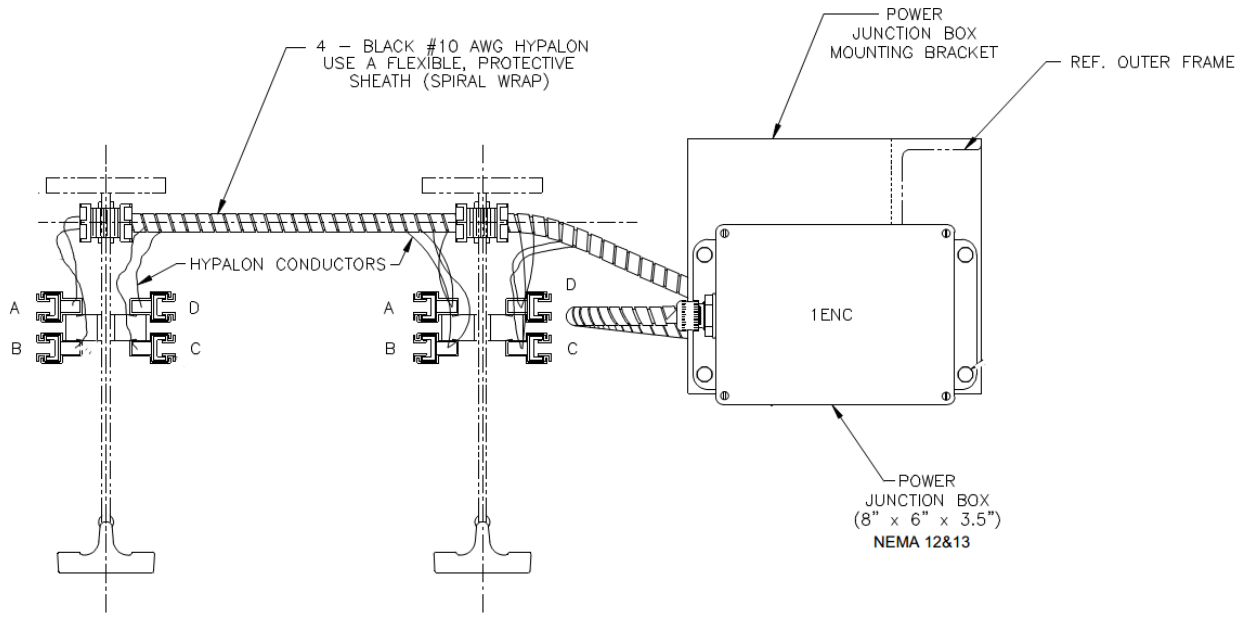
Satisfactory final alignment of the straight and curved monorail sections to the switch will likely be the result of a combination, and perhaps a best compromise, of all of the installation and switch adjustment procedures.

All of the above are a part of normal installation. Installers must take care to properly suspend, align, shim and adjust all points within the switch and monorail components, recognizing that they have the final responsibility and ability to provide the customer with a properly operating system.

Typical Wiring Harness Diagrams

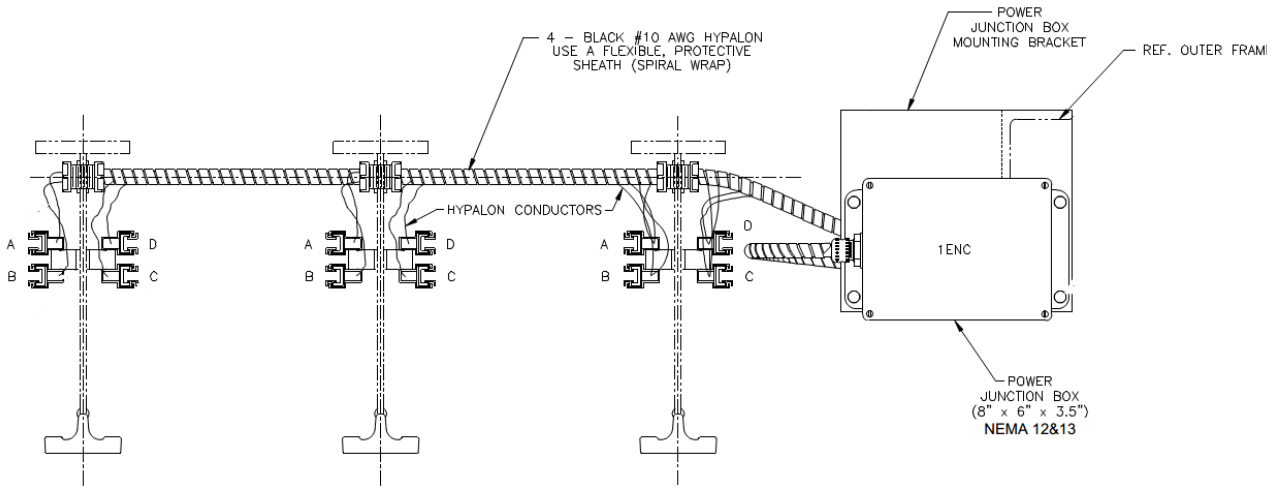
TC/American Crane 2000 Series Electrified Switches are factory wired from a power supply junction box to the conductor bars mounted on the straight and curved rail sections on the switch inner frame. See Figures 24 and 25 below. Refer to drawings provided with the switch for more details.

Building power must be brought to the junction box at each switch location, plus separately to the conductor bars mounted on the monorail sections. The number and spacing of power feeds will depend upon overall monorail length, total amperage load on the system, and voltage drop. For more information, see the Engineering Section of the TC/American Crane Systems Catalog. Consult a qualified electrician for layout of the power distribution system.



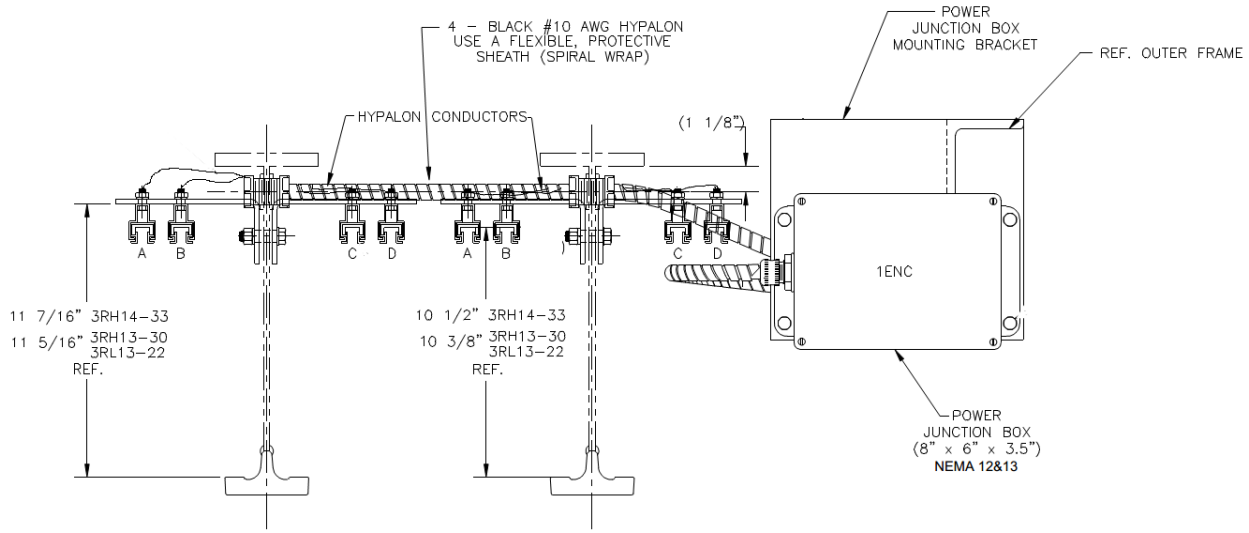
Typical Wiring Harness for 2-Way and Wye Switches, Side Contact Bar
(view looking into switch from incoming rail side)

Figure 24



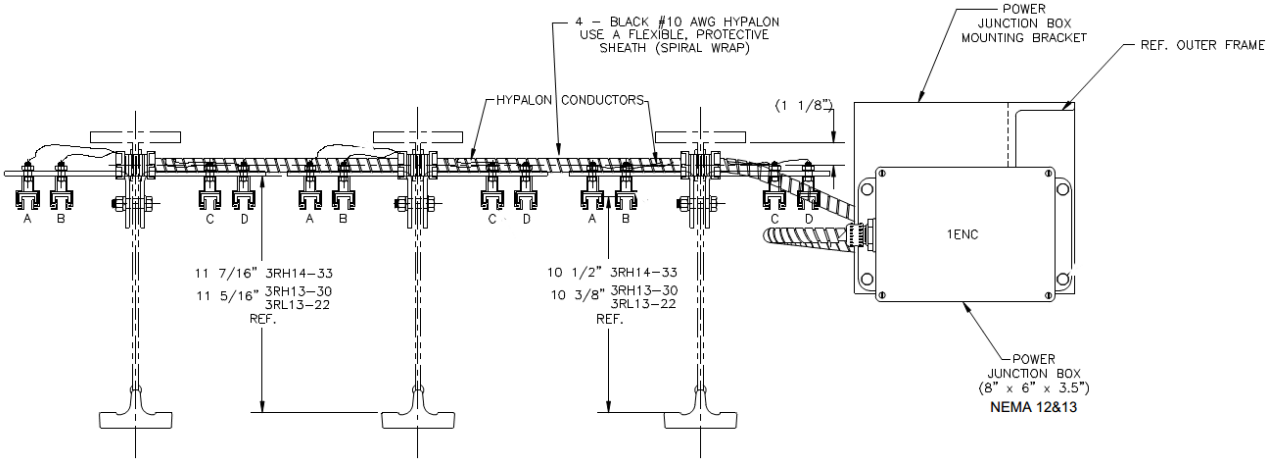
Typical Wiring Harness for 3-Way Switch, Side Contact Bar
(view looking into switch from incoming rail side)

Figure 25



Typical Wiring Harness for 2-Way and Wye Switches, Bottom Contact Bar
(view looking into switch from incoming rail side)

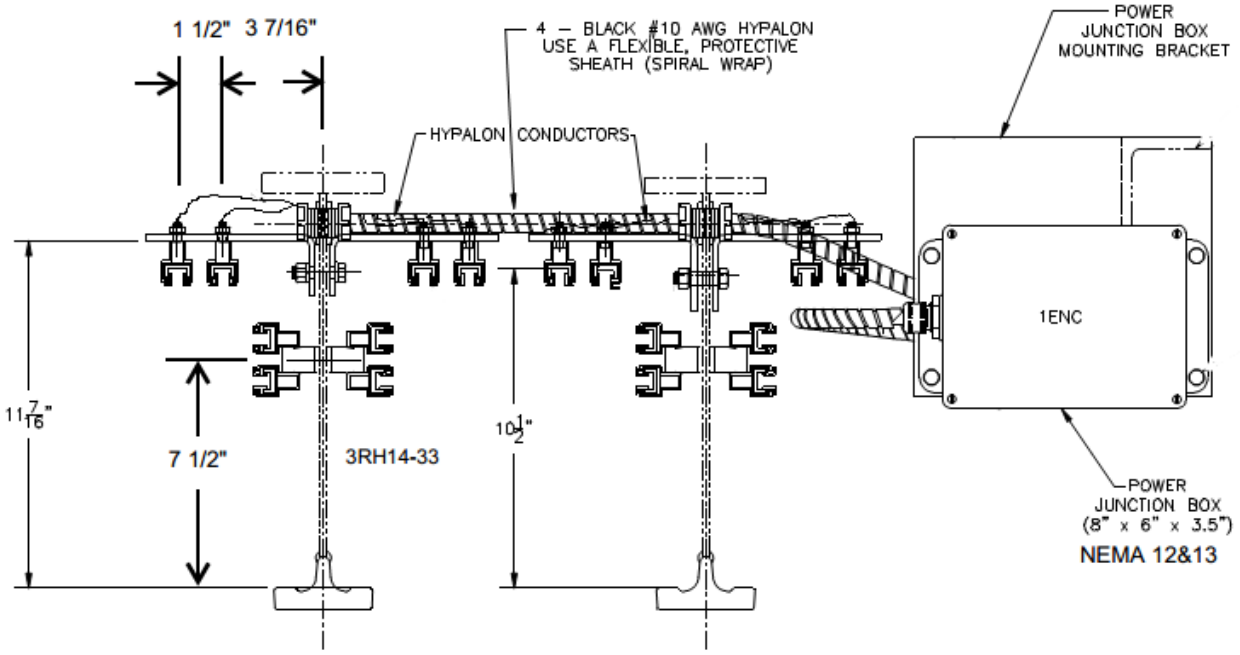
Figure 26



Typical Wiring Harness for 3-Way Switch, Bottom Contact Bar
(view looking into switch from incoming rail side)

Figure 27

For special applications requiring additional conductor bars, the 2000 Series switches may be provided with side and bottom contact conductor bars, as shown in Figure 28. Note that this is only applicable to switches with 3RH14-33 rail and the side contact bar is limited to 7 ½" gauge, requiring the use of trolleys with 5" diameter wheels.



Typical Wiring Harness for 2-Way or Wye Switches with Side and Bottom Contact Bar
3-Way is similar
(view looking into switch from incoming rail side)

Figure 28

Lubrication

General Lubrication Information

1. Latch Crank Assembly and Latch Bars
   Lightly grease the latch crank pin and the riding surface of the latch bars.
2. Guide Rollers
   All guide rollers or cam followers are sealed bearings do not require lubrication.
3. Motor Operator arm mechanism
   Apply grease to fitting for the radial bearing in the actuator arm (see Figure 15A)
4. Check oil level in gearbox assembly of the operating mechanism (see Figure 15).
   See vendor information for recommendations
5. Air Operation
   a. see vendor information for air tool oil recommended
   b. see vendor information about filter cleaning/replacement

Lubrication Frequency

Recommended approximately each 12 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 Switch Lubricants

(for standard industrial operating environments)

Latch Crank Mechanism	Good grade multi-purpose lithium grease
Motor Operator Arm Mechanism	Good grade multi-purpose lithium grease
Gearmotor (motorized op mechanism)	See vendor manual
Lubricator for air op switch	See vendor manual

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, to not 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.