I-BEAM TRACK FESTOON SYSTEM

INSTALLATION AND MAINTENANCE INSTRUCTIONS

INTRODUCTION

The following procedure has been established to provide a simple and accurate method of installing an I-Beam Track Festoon System. Various sketches are included throughout this bulletin to clarify the assembly procedure.

A. I-BEAM TRACK INSTALLATION

1. Structural I-Beam corresponding to ASTM-A36 Specifications or equal is acceptable for use as track.

2. The I-Beam runway installation tolerances shall be as follows:

   a. Lower beam flange slope deviation not to exceed rise/run ratio of 1”/10’ along beam length and .02”/1.00” across flange width with respect to a true horizontal plane.

   b. Standard manufacturing tolerances shall apply to I-Beam shape and camber/sweep deviations.

3. I-Beam joints may be bolted at upper flange to the supporting framework making note that interference with festoon trolley wheels must not occur — .5” minimum clearance required. Joints shall be precisely matched and butted tightly together — .03” gap maximum allowable. Grind joint smooth and flush all around.

4. I-Beam joints may be welded all around lower flange continuing up web of beam at least 50% of depth with a root opening equal to 25% of web thickness. Grind weld smooth and flush all around joint for optimum transition of trolley wheels.

5. The I-Beam track must be parallel to the customer’s crane or hoist support rail. Deviation shall not exceed 1” in 10’ of length, or 2” for entire system length.

6. Determine the distance between the center lines of the customer’s trolley rail and the I-Beam track by the following formula:

   (Loop Depth (in.) X .20) + (Saddle Width X .50)

7. Special beams with hardened and ground lower flanges may be considered for high speed, high cycle applications. Contact the factory.

8. The I-Beam track may be supported by any suitable framework to suspend the entire weight of the festoon system using bolt fasteners (Grade 8 min.), or welding at 5 foot increments throughout beam length. The recommended minimum safety factor is five.

9. This manner of installation is acceptable for an I-Beam track supporting framework manufactured of similar materials having equal coefficients of thermal expansion. If this condition cannot be satisfied whereas expansion joints are required, proper operation of this festoon system and component life will be seriously impaired.

B. TROLLEY CARS AND RUNNING GEAR

1. Trolley cars are furnished with running gear sets designed to operate on I-Beam flanges having nominal width dimensions.

2. The running gear sets can be adjusted during installation to compensate for beam flange width variations. The following procedure is for all standard running gear sets:

   a. Remove running gear mounting plate.

   b. Add or remove layer(s) of flatwashers between the mounting plate and the spacers, as required.

   c. The quantity of flatwasher layers at opposing sides of the car must be equal or within one.

   d. The quantity of flatwasher layers at opposing ends on the same side of the car must be equal.

3. The clearance between the beam flange edge and the main wheel flange or the guide wheel (depending on the type of running gear supplied) must be .010” to .050” each side. This would produce an overall lateral movement of .020” to .100”. (Figs. 1a & 1b)

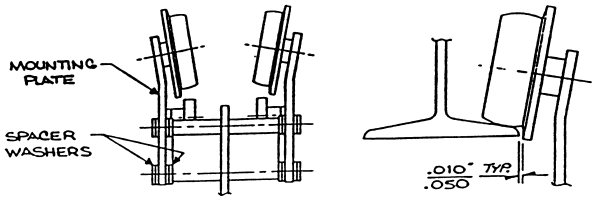

Fig. 1a

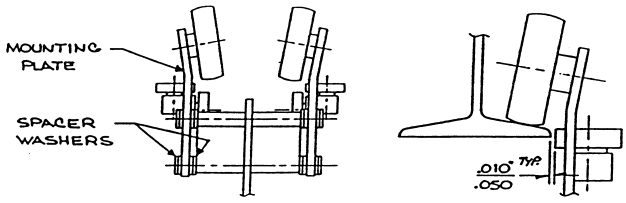

Fig. 1b

4. Running gear which guide at the web of the beam do not require adjustment.

5. All trolleys must traverse the total length of beam smoothly with no binding.

C. END CLAMP

1. Locate and drill holes through the lower flange of the I-Beam to attach end clamp.

2. Secure to beam with Grade 5 bolts or better.

3. A thrust bar should be welded to the underside of the lower beam flange immediately behind the end clamp to absorb impact forces.

4. The bumper to bumper contact at the end clamp must be symmetrical with the adjacent trolley.

5. Flatwashers can be used as spacers to obtain proper bumper alignment vertically on systems where the end clamp attaches to the underside of the lower beam flange.

D. **TOW CLAMP** (When required)

1. A tow clamp is used in lieu of a tow trolley and connects directly to the customer's tow arm. (Fig. 2)

2. The customer's tow arm must support the weight of the tow clamp and the cables and withstand any horizontal forces during system operation.

3. Secure to tow arm with Grade 5 bolts or better.

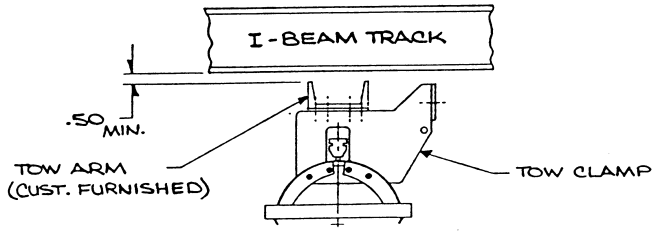

Fig. 2

E. **CABLE INSTALLATION**

1. The cable/hose payload shall be arranged to provide a uniform stack height for best clamping characteristics. There are three different clamping pad styles that have varying degrees of compressibility. The style utilized on a particular trolley is determined by Gleason Reel and based on the cable/hose specifications provided by the customer at the quoting and confirming stages of a purchase agreement. Accurate payload information is essential for optimum clamping characteristics. Many applications require a custom contoured clamping cushion to fit a specific cable/hose arrangement.

2. The cable/hose payload must be arranged to provide a balanced load transmitted through the trolley body for best performance and longest life. An unbalanced trolley will guide at one side of the I-beam flange, resulting in accelerated wear and failure. A balanced trolley will depend on the sum of the torque values to equal zero. These values will be determined by the product of each cable/hose weight in a loop and their distance from the trolley body.

3. Position the heaviest cable/hoses near the trolley body. Cables having the largest wire sizes are recommended at the top of a stack, since these cables will be subjected to the most severe tensile loads.

4. When a festoon system general arrangement drawing is supplied, lay out the cables per the cable arrangement view.

5. Individual stacks of cables can be temporarily bound together intermittently for easier handing.

6. Mark the cable length required between the tow trolley and the customer's termination. This dimension is specified at time of order and cannot be changed.

7. Mark the remaining length of cable for the trolley positions at intervals equal to the "cable length per loop" dimension given on the sales order or general arrangement drawing.

8. Any remaining cable is for hook-up from the end clamp to the customer's termination.

9. Cable/hose terminations should be completed after the loops have been adjusted and the loop clamps installed (Steps F and G). Avoid connections or splices at any loop between the Tow Trolley and the End Clamp. The high tensile forces and cable/hose activity can adversely effect these areas.

Trolleys with Saddles Bolted to Car Body: (Fig. 3)

10. Remove the rubber cushion clamp bars from the saddles.

11. Locate the trolleys with the clamp bar position directly beneath the marks on the cable package.

12. Replace the clamping bars and tighten against the cables (do not crush).

13. Place the trolleys with cable onto the I-Beam at the storage end of the system, starting with the Tow Trolley. Attach the end clamp to the beam per Section "C". Dress the cable loops per Section "F".

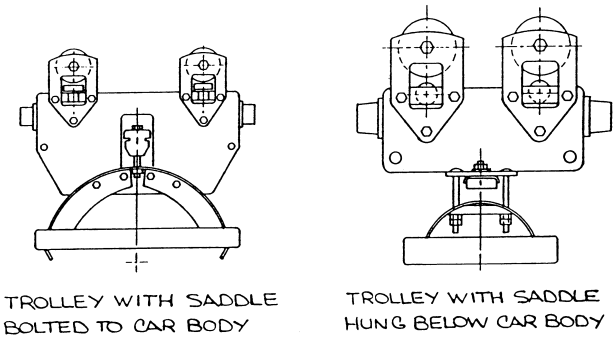

Fig. 3

Trolleys with Saddles Hung Below Car Body: (Fig. 3)

14. Remove the carriage bolts from one side of the saddle and attach trolleys to the cable package with the mark directly beneath the rubber clamp pad.

15. Draw up saddles evenly to secure in place.

16. Place the trolleys with cable onto the I-Beam at the storage end of the system, starting with the Tow Trolley. Attach the end clamp to the beam per Section "C". Dress the cable loops per Section "F".

F. **CABLE LOOP DRESSING** (For two layers of cable or more)

1. Begin at a central cable loop position and loosen the cables.

2. Without shifting the lowest layer of cables, shorten each successive layer of cables upward in the loop to remove any kinks and create a space between layers of approximately 1/4 inch.

3. Reclamp cable package to saddles to prevent shifting. Do not overtighten or crush cables.

4. Dress each cable loop working toward both ends of the system per Step 2.

5. The cable package must be positioned to concentrate the center of gravity at the center of the saddle and trolley.

G. **CABLE LOOP CLAMPS**

1. Cable packages having three or more layers require a cable tie or clamp. Two clamps per loop are needed and must be located halfway down each side of the loop. (Fig. 4)

2. The clamps should be staggered at every loop position to eliminate collisions during system retraction.

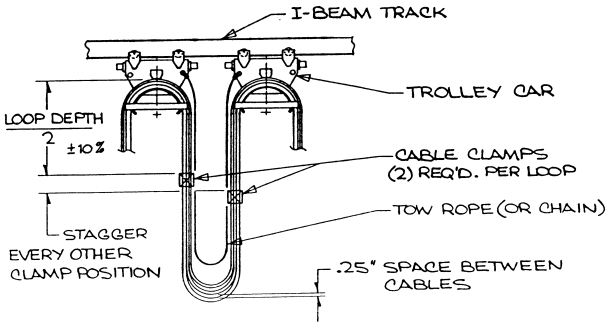

Fig. 4

H. **TOW CHAINS OR TOW ROPES** (when required)

1. Tow chains (or tow ropes) are installed at each loop position and attached to the adjacent trolleys through the hole at the lower corner of the car body. The chain (or rope) must not be twisted. (Fig 4)

2. Tow chains are secured in place by bending the "S" hook loop closed.

3. Tow ropes fasten with a shackle and removable pin.

I. **TOW ARM** (required for tow trolley)

1. The tow arm is a device to transmit motion from the customer's crane or hoist to the tow trolley of the system.

2. The tow arm must protrude through the rectangular tube far enough to absorb any lateral movement. Clearance within the tube of 1.0" min. vertically and .20" min. horizontally will compensate for small vertical and large lateral movements. (Fig. 5)

3. Check tow arm movement throughout the total system travel to insure it does not pull from the tow trolley and there are no upward or downward forces transmitted to the tow trolley.

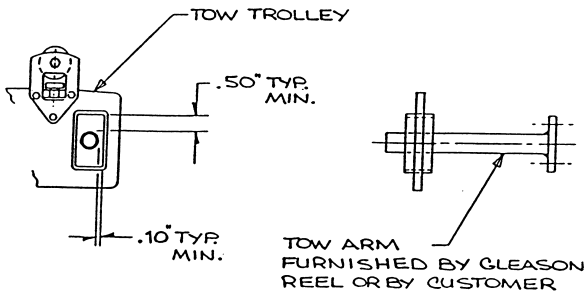

Fig. 5

J. **TENSION ROPES** (for pendant stations)

1. Tension ropes are used to hang a push-button control below the junction box of a control unit trolley. (Fig. 6)

2. Eye bolts or loops at one end of the tension ropes fasten to the lower mounting flange of the junction box.

3. The other end fastens to the top of the push-button control.

4. The electric cable must be long enough to zigzag between the tension ropes every few feet to form a lattice arrangement. The cable must not be wrapped around the tension ropes or vice versa. Secure electric cable to tension ropes with electrical tape or nylon ties.

5. A strain relief watertight cable gland assembly is required whenever tension ropes are not utilized.

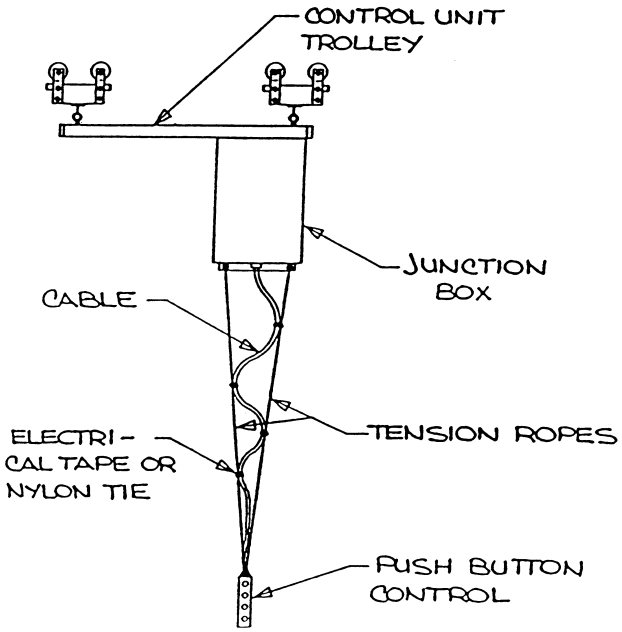

Fig. 6

K. **FUNCTIONAL TESTING**

Now that the Festoon System hardware is completely assembled, operate the system throughout its total travel distance by hand and watch for any indications of pinch points or misaligned joints. All problem areas must be corrected.

Initially locate the tow trolley at the storage distance position. The trolley car bumpers must not be in hard contact with one another. A small clearance is designed into the storage area to prevent a forced compression of the trolleys. Move the tow trolley to its furthest point of travel from the end clamp. The system should be fully extended in this position. Check each loop position to see that the cables are suspended in a relaxed state just above the cables in each loop. Tow chains function primarily as a safety feature to eliminate high cable stresses during rapid acceleration rates and high travel speeds.

The Festoon System is now ready for normal operation.

OPERATING AND MAINTENANCE INSTRUCTIONS

A. **SYSTEM OPERATION**

1. All trolleys must traverse the I-Beam track smoothly. Seizing at pinch points or wheel impacts at joints along the beam flange due to misalignment or the running gear adjusted improperly can cause premature failure.

2. Pinch points occur along the beam flange due to the guide surface of the running gear operating tight against both edges of the beam flange. This can be corrected by adjusting the running gear per Section “B” of the Installation Instructions Bulletin.

3. Impact points along the I-Beam track due to joint misalignment or flange imperfections must be ground flush.

4. Check the trolley position for tracking the beam flange symmetrically. The following items should be checked if the trolley guides at one edge of the beam flange continuously:

   a. The cable package load on the saddles must be balanced at the trolley body to obtain equal loading of all trolley wheels.

   b. The lower beam flange must be horizontal.

   c. The cable loops must be uniform and symmetrical to produce even tension forces between trolleys.

5. When tow chains (or tow ropes) are required on a Festoon system, any high tensile forces normally associated with rapid acceleration rates and high travel speeds are transmitted trolley to trolley by the tow chain. They are designed primarily as a safety device and not intended to be in tension continuously. Tow chains which rapidly pull taut and jerk the trolleys excessively could be caused by the trolley seizing on the I-Beam or the tow chain being too short. Check the tow chain length specified on the sales order materials list or the general arrangement drawing.

6. The tow arm is a device to transmit movement of the customer’s crane or hoist to the tow trolley (lead car). It must have 1.0” min. of vertical clearance within the rectangular tube of the tow trolley and must be perpendicular to the car body to compensate for small vertical and large lateral movements.

7. Tension ropes are used to suspend push button controls beneath the junction box of a control unit trolley for pendant station applications. Two ropes are normally furnished and must be equal in length. The electric cable must be longer than the tension ropes and secured at intervals to form a lattice arrangement. A watertight cable gland is required at the junction box.

8. A Festoon System having many cable loops and trolleys are susceptible to undulating motions during extension of the system. Rapid acceleration, high travel speed, and trolleys seizing on the I-beam are reasons for this behavior. Violent undulations causing tow chains or the cables to tense or snap must be corrected or cable failures are sure to result. Consult factory application engineers for recommendations.

B. **SYSTEM MAINTENANCE**

1. I-Beam Model Festoon Systems are supplied with precision ball bearing wheels which are greased and sealed for life.

2. The heavy-duty Systems can be furnished with grease fittings on the main wheels. These wheels should be inspected every 30 days and regreased if the wheel is not running smoothly. Use grease type Chevron SRI #2 or equal.

3. The following items are recommended for inspection during a normal equipment check:

   a. Wear on the main wheels, the guide wheels, and the anti-lift rollers.

   b. Clamping of cables at the support saddles and loop clamps.

   c. Tightness of nuts and bolts.

   d. Condition of trolley bumpers and tow chains or ropes.

   e. Cable damage.

   f. Cable glands for watertight seal effectiveness.

   g. Terminal connections in junction box.

   h. I-Beam track joint strength, smooth transition across joints and lower beam flange wear.

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