I-152 & I-162 CONTAINER CRANE FESTOON

INSTALLATION AND MAINTENANCE INSTRUCTIONS

INTRODUCTION

The I-152 & I-162 Container Crane Festoon System was designed to run on a specified width I-beam. System trolleys must have been ordered for the size I-beam intended for use or the trolleys will not fit.

Each standard installation includes one end clamp, one tow trolley or tow clamp, and a number of intermediate trolleys. Refer to Figure 1-Typical Installation and Figure 4-Trolley Components and thoroughly familiarize yourself with this product and the terminology used prior to beginning installation.

NOTICE: Safe and proper operation and long life of the festoon system depend on proper installation, maintenance, location and environment. These instructions are intended as a guide but do not cover all possible situations that may arise. Please refer any questions to Gleason Reel or its authorized representative or distributor.

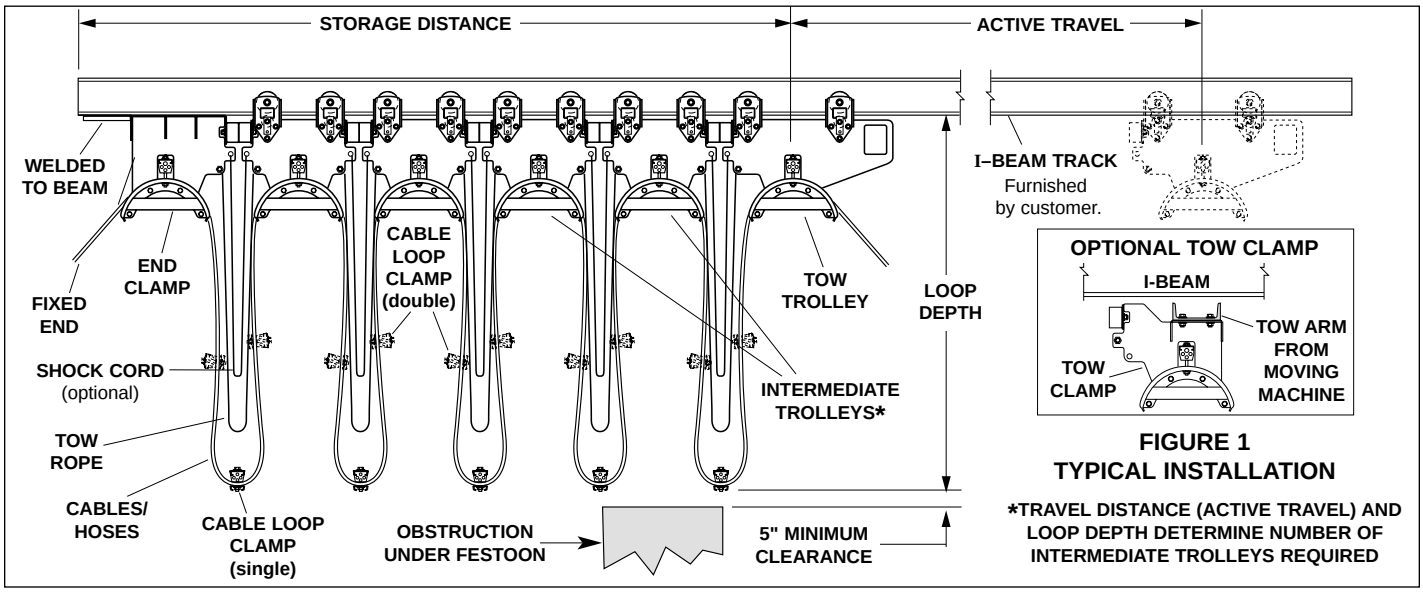


FIGURE 1
TYPICAL INSTALLATION

***TRAVEL DISTANCE (ACTIVE TRAVEL) AND LOOP DEPTH DETERMINE NUMBER OF INTERMEDIATE TROLLEYS REQUIRED**

I–BEAM TRACK INSTALLATION

NOTE:
Special beams with hardened and ground lower flanges should be considered for high speed, high cycle operation.

1. Mount I–beam track to suitable framework that is strong enough to support the entire weight of the festoon system (weight of I–beam, hanging hardware, trolleys and cables or hoses which will be carried by the festoon). Make sure hardware used for hanging I–beam will not interfere with free trolley movement. Refer to Figure 2-Trolley Clearance.

NOTE:
On previously installed track, check all joints and hangers for clearances shown (Fig 2).

2. Special care should be taken in aligning the I–beam sections to the crane or hoist support rails. I-beams must be parallel with rails.

ACCEPTABLE SYSTEM TOLERANCES:

HORIZONTAL PLANE: 0.02" per 1.0" across the lower flange width.
RISE/RUN RATIO: 1.0" per 10.0' along track length, maximum of 2.0" for entire SYSTEM LENGTH.

3. Join beams by welding, keeping clearances shown in Figs 2 & 3. Grind welded joints smooth (Fig 3).

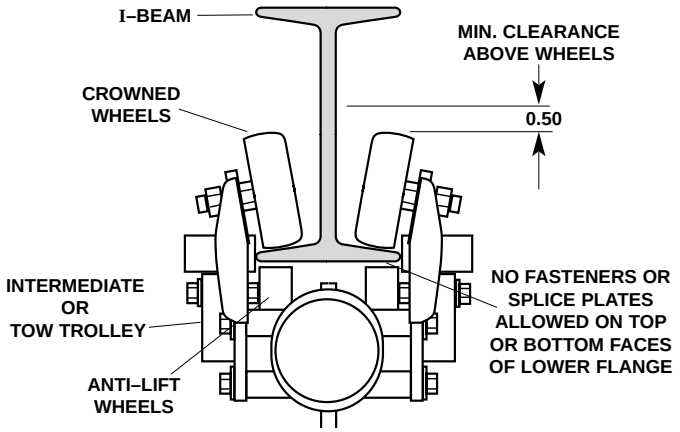


FIGURE 2–TROLLEY CLEARANCE

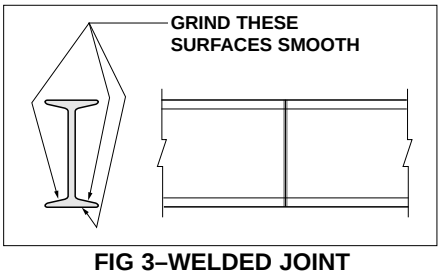


FIG 3–WELDED JOINT

TROLLEY INSTALLATION

There are three types of trolleys: End Clamps, Intermediate, and Tow. The END CLAMP is first on the storage end of the system. It is stationary, bolted to the track, and acts as the "bumper" to stop the trolleys when they are moved into storage. See Figure 1–Typical Installation. INTERMEDIATE trolleys carry the cable or hose. Number and spacing of intermediate trolleys is determined by length of cable/hose and loop depth. The TOW trolley is last in the string and is attached to the moving machine (crane, machine tool, etc.) serviced by the festoon system. The Tow Trolley may be replaced by a Tow Clamp bolted directly to the moving machine.

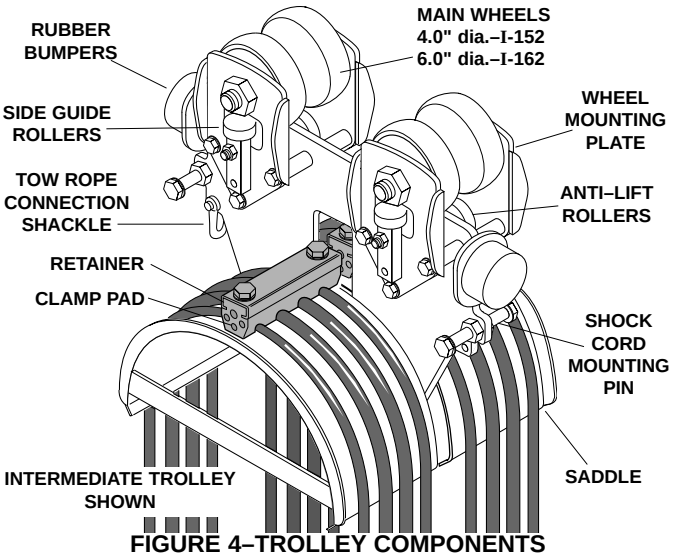


FIGURE 4–TROLLEY COMPONENTS

1. Check to make sure all trolleys are sized for I-beam installed previously. Trolleys are furnished to fit a specific beam width. Clearance between beam flange edge and main wheel flange or side guide wheel (depending on type of wheel) must be .040" - .080" on each side. This produces an overall lateral movement of .080" - .160". All trolleys must roll total length of beam smoothly with no binding. Trolleys can be adjusted during installation to compensate for slight beam width variations as follows:

   A. Remove wheel mounting assemblies (Fig 5).

   B. Add or remove flat washers between the mounting plate and the threaded boss as required to achieve proper side clearance (Fig 5).

   NOTE:
   Quantity of washers must be equal on the same side and within one from side-to-side on the same trolley.

   C. Reinstall mounting plates using Loctite 242 on screw threads. Torque to 45–50 ft lbs (61-68 Nm).

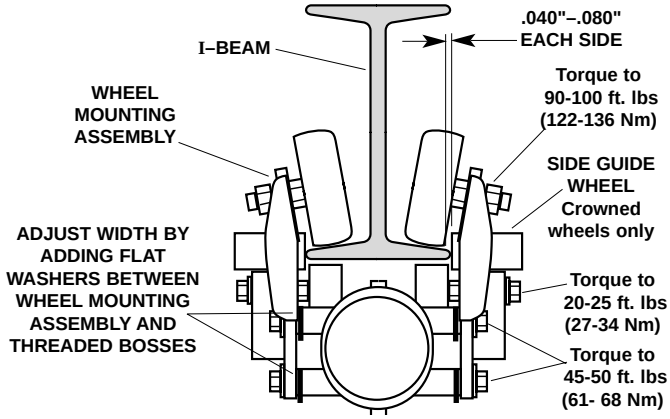


FIGURE 5–TROLLEY WIDTH ADJUSTMENT

2. Temporarily position trolleys as they will be stored (Fig 1).

3. Position END CLAMP beneath I-beam. Mark mounting hole locations and drill through beam flange. Secure with Grade 5 bolts or better. (Fig 6).

4. Weld thrust bar to underside of I-beam (Fig. 6). Bar must be snug against End Clamp to absorb impact forces.

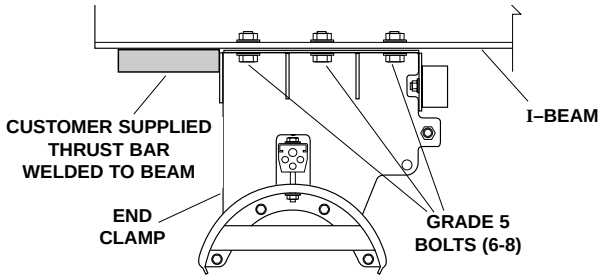


FIGURE 6–END CLAMP & THRUST BAR

Tow Trolley Installation:

System may have either a TOW TROLLEY or a TOW CLAMP. Tow trolley rolls on beam. Tow clamp is supported by tow arm.

5a. Adjust width of trolley to fit beam as in step 1.

6a. Mount tow arm to moving machine with tow arm end inserted through tow trolley (Fig 7). Tow arm must protrude through trolley far enough to absorb any lateral movement. Check throughout total travel to insure arm does not pull out of trolley.

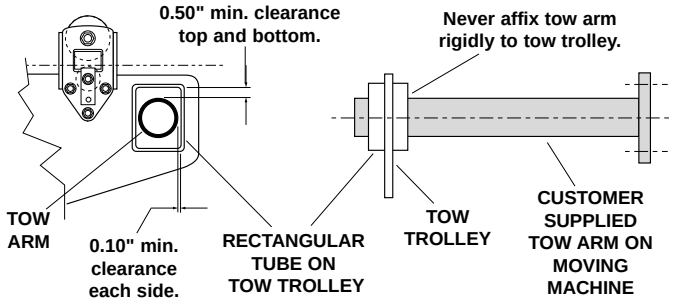


FIGURE 7–TOW ARM CLEARANCE

Tow Clamp Installation:

5b. Check to make sure tow arm will support weight of clamp and cables as well as horizontal forces imposed on it.

6b. Secure clamp to tow arm using Grade 5 bolts or better. Make sure that tow clamp bumper lines up with intermediate trolley.

7. Roll all wheeled trolleys along entire length of track. Check for binding or interference from hanging or joining hardware or weld bead. Fix areas of concern. **NOTE: Check gap in track at boom hinge. Gap should not exceed 0.25"(6mm) when boom is lowered and edges should be rounded or tapered to avoid excessive wear to trolley wheels.**

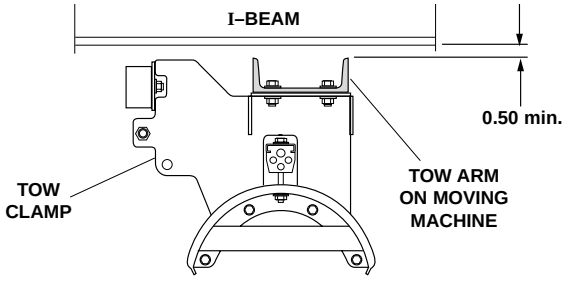


FIGURE 8–OPTIONAL TOW CLAMP

CABLE INSTALLATION

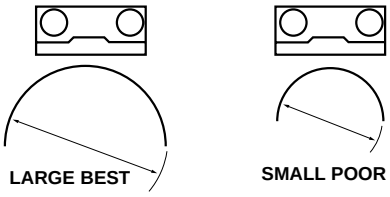
Proper cable installation is the key to a successful festoon system. Refer to the guidlines below while following the cable installation procedure.

CABLE GUIDELINES

Bending Cables

It is best to follow the rule that "BIG BENDS ARE BEST" for good service and long life. Cable manufacturers vary in applying a multiplier and we offer the following guide as typical. Gleason uses the chart below.

CABLE O.D.	MINIMUM RADIUS	MINIMUM SADDLE DIA.
Under 0.3 in.	3 x O.D.	6 x O.D.
Under 0.5 in.	4 x O.D.	8 x O.D.
Under 0.8 in.	5 x O.D.	10 x O.D.



Cable O.D. Variations

Variations should be kept to a minimum. Clamping is best accomplished when all cables are same O.D. or close (Fig 9). Wide deviation (Fig 10) makes clamping difficult and cable may not remain in saddle.

FIGURE 9–BEST

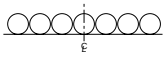
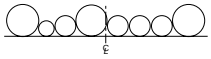


FIGURE 10–POOR



Balance in Loading Cable

This is important for smooth running, long wheel bearing life and alignment of components. It is best to distribute the cable evenly, with the heaviest cables near the center.

FIGURE 11–BEST

FIGURE 12–POOR

Flat Cable Stacking

A. Secure clamping
EXTREMELY IMPORTANT: At least 50% of cable surface must be under clamp pressure.

FIGURE 13
BEST
100% clamping

FIGURE 14
GOOD
50% clamping

FIGURE 15
POOR

B. Height consideration
Flat cable stacking best when width is 3–4 times height, as in Figures 14 & 15 above. High stacking can work as long as equal pressure is applied to all cables. See Figure 17.

FIGURE 16
OK

C. Configuration
BIG CABLE ON TOP provides maximum bending radius, improves heat dissipation and takes pulling force when tow cables are not used. See Fig. 18.

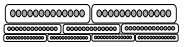


FIGURE 17
BEST

1. Remove all twist from round cable.
2. On cable, mark length required between TOW trolley and termination junction.
3. Mark CABLE LENGTH LOOPS per General Arrangement Drawing. Remaining cable is for hookup from FIXED trolley to termination point.
4. Hang cable. All marks on cable must align with tops of saddles (Fig 18). Arrange multiple cables per General Arrangement Drawing or Cable Guidelines (Figs 9–17. above).

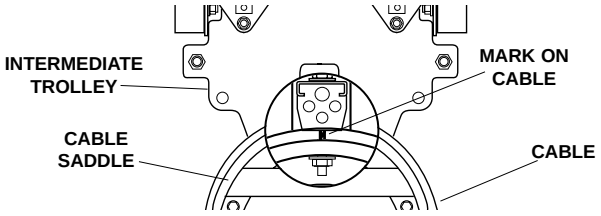


FIGURE 18–ALIGNING CABLE MARKS

5. After cable loops are aligned, clamp cables in place using cable clamps or clips depending on application. **Clamp** tightness is determined by how much the rubber clamp pad distorts the cable or hose (each type of cable will react differently). Approximately 15 ft. lbs. (20Nm) is suitable with good quality cable or hose. Allowable total distortion to get adequate clamping pressure must be determined by the installer **but excessive pressure may damage the cables**. Cable **clips** should be tightened to 40-50 in. lbs (4-6 Nm) **maximum** for clips with 6mm threads, 90-100 in. lbs. (10-11 Nm) for clips with 8mm thread and 160-180 in. lbs. (18-20 Nm) for clips with 10mm threads (Fig 19). Tighten jam nut to secure.

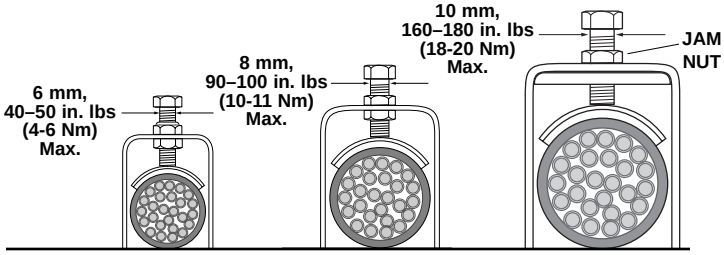


FIGURE 19–TIGHTENING CABLE CLIPS

⚠ CAUTION

Values above are MAXIMUM torque for each size clip. Some cables may not need to be tightened to the maximum. Do not over tighten.

6. Install CABLE LOOP CLAMPS. Using one clamp per loop is not recommended. When using two clamps per loop, clamps must be staggered (Fig. 20) to prevent them from colliding during system operation. **Clamp** tightness is determined by how much the cable or hose distorts (each type of cable will react differently- 6–12 ft.lbs [8–16Nm] average). **Excessive tightness may damage cables.** IMPORTANT– All cables must be clamped evenly to prevent cables from sliding in the loop clamps. It will be necessary to build up smaller cables if they are clamped with larger cables. To do this, self vulcanizing wrap (Gleason p/n 108578) is recommended.

NOTE:

When using stacked flat cable, two loop clamps **must** be used and loops must be adjusted so that there is space between bottoms of individual cable loops. See Figure 20.

7. Complete cable termination connections after loops have been adjusted and loop clamps installed. Avoid connections or splices at any loop between TOW trolley and FIXED trolley.

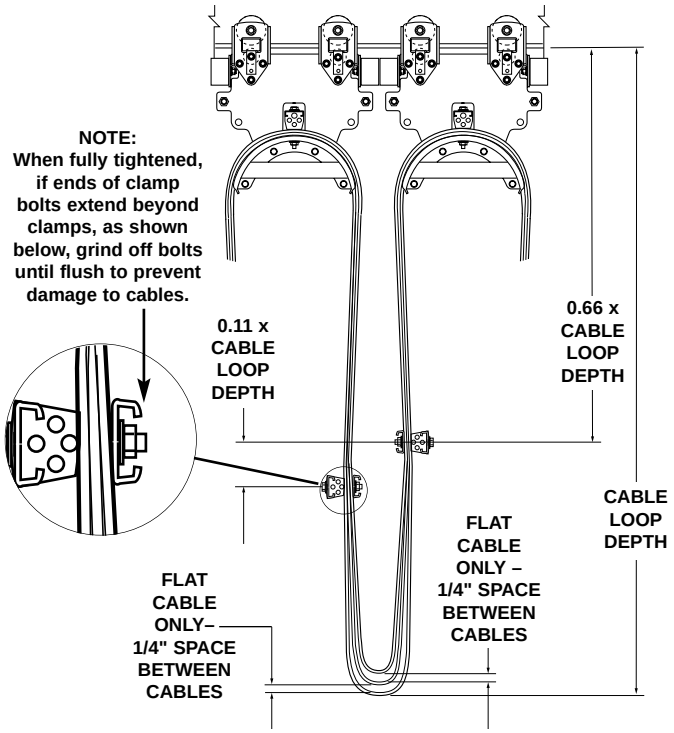


FIGURE 20–FLAT CABLE LOOP ADJUSTMENT

INSTALLING TOW ROPES

Tow ropes "pull" the festoon system along the track, minimizing wear to and prolonging the life of electrical cables or hoses being carried. Without tow ropes, the electrical cables are required to act as tension members which can lead to separated conductors. On multiple cable applications it is virtually impossible to adjust a festoon system so that all cables are exactly the same length. Thus all force is directed to the shortest cable, further compounding the problem. Tow ropes are slightly shorter than the cables in each loop and no strain is put on the electrical cables or hoses themselves. See Figure 1–Typical Installation.

1. Mount tow ropes with shackles supplied. See Figure 21.

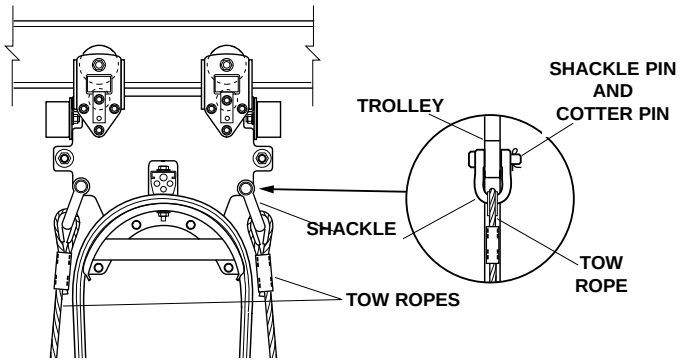


FIGURE 21–TOW ROPE INSTALLATION

INSTALLING SHOCK CORDS

Shock Cords are slightly shorter than tow ropes and are used in pairs...two or four between each trolley. Spring loaded, their function is just as their name implies; they act as shock absorbers when the festoon trolleys are beginning to move, limiting undue stress on the tow ropes.

NOTE:
Do not use shock cords unless tow ropes are installed.

1. Mount shock cords on sleeves with M12 thru bolt, flat washers and ESNA lock nut as shown in Fig 22.

2. Torque to 45-50 ft lbs (61-68 Nm). Metal ends on shock cords must be free to rotate on sleeves.

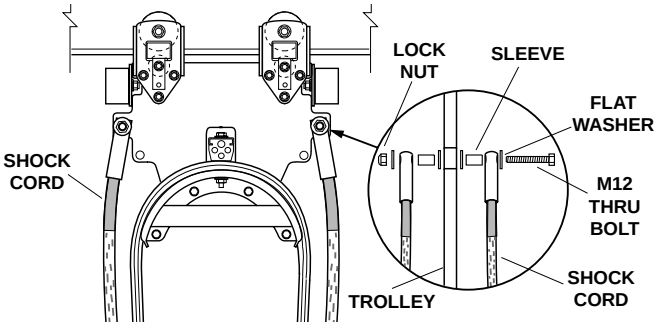


FIGURE 22–SHOCK CORD INSTALLATION

TESTING

1. S**lowly** operate festoon system throughout the total travel.

   A. Check for "smooth rolling wheels", misaligned joints, hanging or joining hardware interference, and interference of cable loops with operating area.

   B. Make sure tow rope gets tight before electrical cables or hoses. Adjust length of cable or hose loop, as required.

   C. Make sure shock cords are stretched before tow rope gets tight.

2. With festoon trolleys in STORAGE POSITION, check to see that intermediate trolleys can move back and forth slightly. They must not be packed "tight" when tow arm is at end of travel.

3. With festoon system FULLY EXTENDED, check each loop to see that cables are suspended uniformly between trolleys and that cable load is balanced in saddle.

4. Check all loop clamps. Make sure they are properly positioned, that all cables are properly clamped, and that no bolts protrude beyond clamp flanges.

5. Correct all problems before routine operation of crane or hoist.

MAINTENANCE

1. During normal equipment inspection, perform the following checks and maintenance:

   A. Check for wear on trolley wheels, side guides and anti-lift rollers. Main wheels are supplied with sealed or regreasable bearings. Sealed bearings do no require maintenance. Regreasable bearings should be inspected every 500 hours of operation and regreased if necessary using Chevron SR1#2 or equal. Side guide and anti-lift rollers are sealed bearings and do not require maintenance.

   B. Check for loose fasteners and nuts, especially the bolts holding the fixed trolley to the I-beam. Tighten if required.

   C. Check for wear or fractured walls on the rectangular tube on the tow trolley. Repair or replace as necessary. If undue wear persists, check alignment of tow arm throughout entire travel. Refer to TROLLEY INSTALLATION, Step 6a.

   D. Check condition of bumpers, tow ropes and shock cords. Replace as required.

   E. Check for damaged cable and the tightness of cable and loop clamps.

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