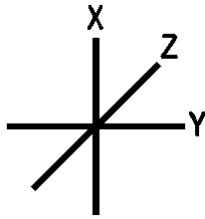


A common area of failure with active crane runways is the crane girder to building column connection. The Gantrex Tie-Back System is designed to provide a proven solution to this problem.

- Spherical bearings allow girder end rotation, longitudinal and vertical movement without stressing the tie-back linkage.
- A single linkage can transmit up to a 165 kip side thrust in tension or compression.
- Sizes are available to fit any girder and column configuration.
- The tie-back linkage assembly eliminates diaphragms and the associated maintenance from cracking.
- Designed to suit.

GIRDER TIE-BACKS FATIGUE ISSUES

Girders to Building Column Tie-Backs are Prone to Fatigue Failure. The main causes of fatigue are depicted below:



1.0

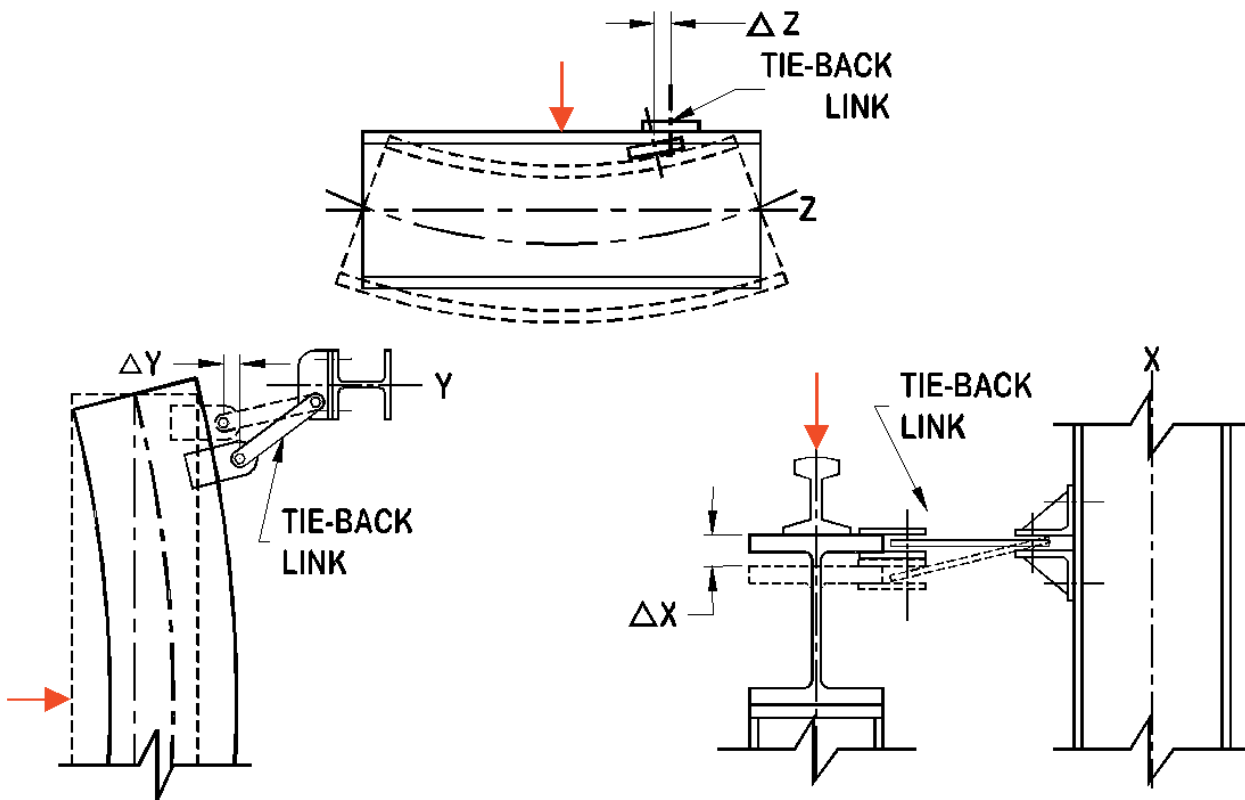
Girder deflections of L/1000 or other chosen allowable bending limit between the support columns causes top flange compression. This deflection results in girder end rotation in the (Z) direction.

2.0

Side thrust of the crane generated by trolley movement, crane skewing, and imperfect rail alignment cause girder end rotation in the (Y) direction.

3.0

Vertical loading of the crane directly above the girder column support will cause compression of this support relative to the building column in the (X) direction.



Dynamic loading on the crane girders results in eventual fatigue failure of standard tie-backs in the three axes (X,Y,Z). A flexible bearing tie-back is called for to eliminate this recurring problem. Please refer to the following standard mounting brackets and sizing sections while completing the application data sheet.

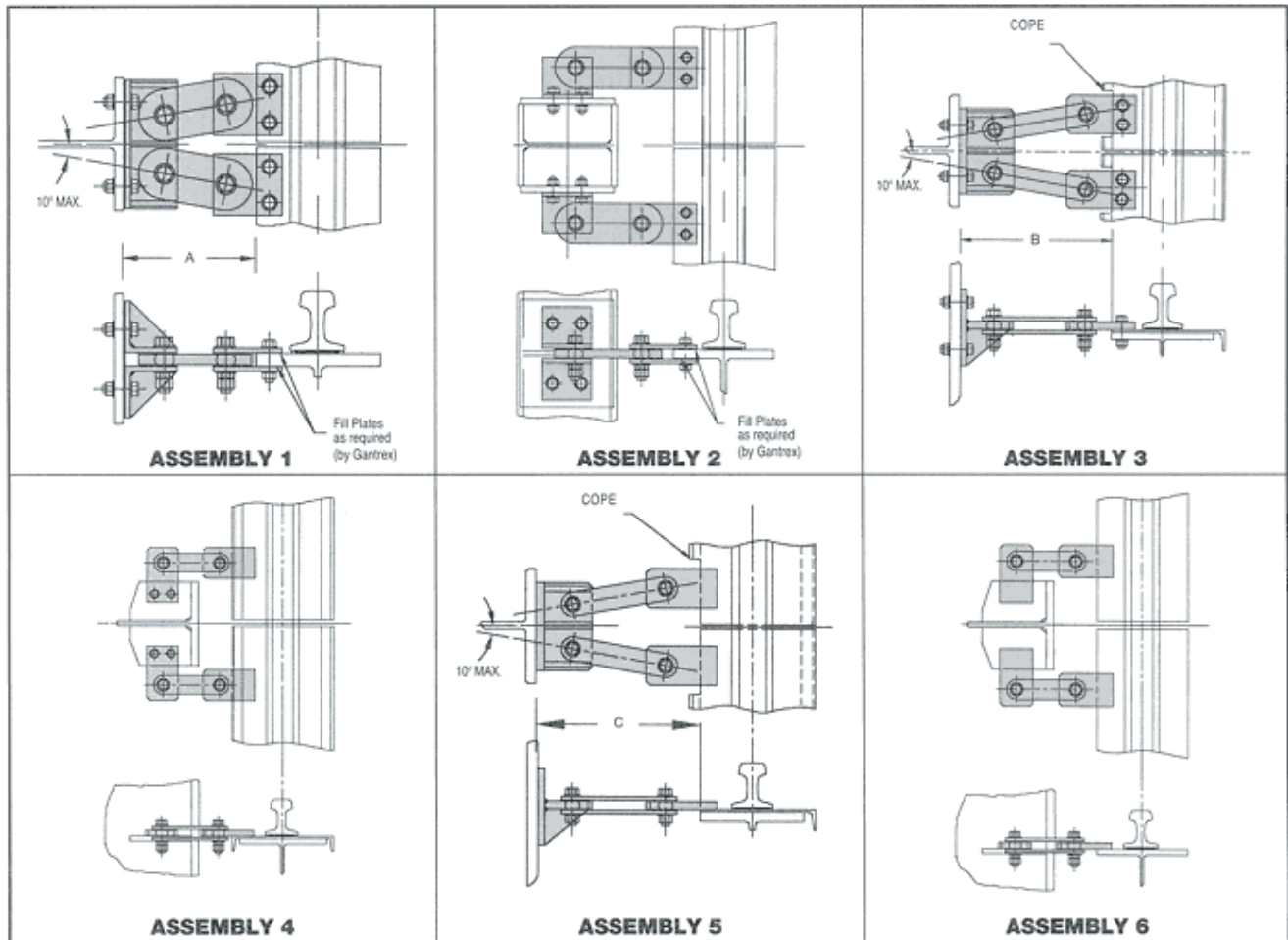
GIRDER TIE-BACK LINKAGE ASSEMBLIES

TIE-BACK ASSEMBLY MOUNTING BRACKETS

The most common tie-back assembly configurations are illustrated below. Assembly 1 includes shim plates at the column face connection to compensate for variations in the distance between the girder and column. Assemblies 2, 3, 4, 5 and 6 can be designed for either bolting or welding to the column.

GANTREX can normally design and fabricate custom assemblies based on one of our standard illustrated configurations. If none of these standard assembly configurations are practical, GANTREX will develop a special assembly to meet your specific application.

STANDARD TIE-BACK ASSEMBLIES (Shaded items supplied by Gantrex)



MODEL NO.	"A" MIN (ins.)	"B" MIN (ins.)	"C" MIN (ins.)
128G	6 1/2	NA	NA
128GPA	8	7 3/4	7 1/2
119G	7 1/2	NA	NA
119GPA	10 5/8	11 7/8	11 5/8
122G	10	NA	NA
122GP	12	11 1/2	11 1/4
123G	12	NA	NA
123GP	12 3/4	12 1/2	12 1/4

GIRDER TIE-BACK LINKAGE ASSEMBLIES

GIRDER TIE-BACK LINKS

DIMENSIONS (ins)		L1 UP TO 100,000 DUTY CYCLES	L2 UP TO 500,000 DUTY CYCLES	L3 UP TO 2,000,000 DUTY CYCLES	L4 OVER 2,000,000 DUTY CYCLES
MODEL NO	Bearing Nominal Dia.	ALLOWABLE WORKING LOAD (lbs.)	ALLOWABLE WORKING LOAD (lbs.)	ALLOWABLE WORKING LOAD (lbs)	ALLOWABLE WORKING LOAD (lbs)
TL128GPA	3/4	17,900	15,300	12,800	10,000
TL119GPA	1	44,500	38,100	31,800	24,900
TL122GP	1 1/4	63,500	54,400	45,300	35,500
TL123GP	1 1/2	76,200	65,300	54,400	42,600
TL130GP	2	106,100	91,000	75,800	59,300
TL131GP	2 1/4	135,800	116,400	97,000	75,900

DIMENSIONS (ins)		L1 UP TO 100,000 DUTY CYCLES	L2 UP TO 500,000 DUTY CYCLES	L3 UP TO 2,000,000 DUTY CYCLES	L4 OVER 2,000,000 DUTY CYCLES
MODEL NO	Bearing Nominal Dia.	ALLOWABLE WORKING LOAD (lbs)	ALLOWABLE WORKING LOAD (lbs)	ALLOWABLE WORKING LOAD (lbs)	ALLOWABLE WORKING LOAD (lbs)
TL128G	3/4	12,500	11,700	9,750	7,800
TL119G	1	28,000	24,000	20,000	16,000
TL122G	1 1/4	44,500	38,400	32,000	25,600
TL123G	1 1/2	50,000	45,600	38,000	30,400
TL130G	2	65,000	57,600	48,000	38,400
TL131G	2 1/4	80,000	72,000	60,000	48,000

HOW TO ORDER A TIE-BACK ASSEMBLY

Simply complete the GANTREX Tie-Back Application Data Sheet and forward it to your nearest GANTREX sales office. A copy can be found at the end of this girder tie-back section or can be requested by contacting your nearest GANTREX sales office.

Upon receipt of the completed application data sheet, GANTREX will prepare a proposal drawing and quotation for your review. Once the design is accepted, GANTREX will fabricate, shot blast, prime, and then ship the assemblies ready for installation. Unless otherwise directed, GANTREX provides only the fasteners needed to produce the assembly but not those needed to attach the assembly to the girder and column.

GIRDER TIE-BACK LINKAGE ASSEMBLIES

OPERATION:

Hardened spherical bearings in each end of the linkage accommodate all movements between the girder and column, such as:

- Girder end rotation and translation
- Girder (and separate column) depth displacement

Due to the small clearance between ball and socket (less than .004"), side thrust is transferred efficiently into the column.

MATERIALS:

- Ball case hardened to a depth of .020 to .030 inches
- Standard linkage from carbon steel (minimum yield of 44,000 psi)
- Permanent lubrication sulfinuz process and molybdenum disulphide grease

GP SERIES

- Are assembled with the bearing housing pressed into the link.
- Can have linkages custom designed for greater side-thrusts than shown.
- Are available with special bearings to 3 1/4" bolt diameter.
- Are available with a hot dip galvanized link.
- Are generally available in less time than G series.

G SERIES

- Are manufactured to customer specification with integral linkage and bearing housing.
- Can have a shorter "A" dimension than the GP Series.
- Require longer lead time except for standard sizes that are normally carried in stock, i.e., TL128G3, TL128G6, TL128G9, TL119G3, TL119G6, TL119G9.
- Are available with a hot dip galvanized link.



TOLL FREE: 800 2 GANTREX (800) 242-6873

Web site: www.gantrex.com • Email: sales@gantrex.com

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