

## **Tutorial on Modeling of Pipe Supports in CAEPIPE in line with standard Pipe Support Catalog**

This document provides guidelines for modeling mathematical supports in CAEPIPE in line with Piping Technology and Products, Inc. Support catalogue.

A similar document for modeling mathematical supports in CAEPIPE in line with LISEGA and SSG Support catalogues, developed by Skios Engineering AB, is available at the link

[https://skios.se/onewebmedia/Support/FAQ-CAEPIPE/Modelling\\_Support\\_types\\_CAEPIPE.pdf](https://skios.se/onewebmedia/Support/FAQ-CAEPIPE/Modelling_Support_types_CAEPIPE.pdf)

In addition to the above, this document provides the syntax for filling the Support Attributes at 3D Plant Design Support location for transferring the Support details to CAEPIPE and CAEPIPE 3D+ through SST's dataTranslators.

The value provided under the column titled "Support Data" for each support can be directly entered to the support attribute in 3D Plant Design software when you select the option "Transfer Support without using Mapping DB" with Plant Design-to-CAEPIPE Translators, checkSTRESS, HOTclash and CAEPIPE 3D+.

On the other hand, enter the value provided under the column titled "Support Data" into the field "KPSupport" of SupportType.mdb supplied with the products given above.

For Support Data, if you use E3D/PDMS as 3D Piping Design software, then for transferring the Support Data without the use of the Mapping DB, fill the attribute "Supcode" of ATTA/ANCI with the value provided under the column titled "Support Data" in this document corresponding to each support.

For further details about the Support Mapping, please see sections titled "Appendix D" and "Appendix E" in PD2CAEPIPE User's Manual / checkSTRESS User's Manual / HOTclash User's Manual / CAEPIPE 3D+ User's Manual.

Global Vertical axis in CAEPIPE is assumed to be "Y" in this document. In case the Global Vertical axis in CAEPIPE is "Z", then replace the letter "Y" with "Z" in Support Mapping syntax and Support Data provided in this document.

Friction coefficient is assumed to be 0.3 wherever applicable in this document. Friction coefficient can be replaced with the required value.

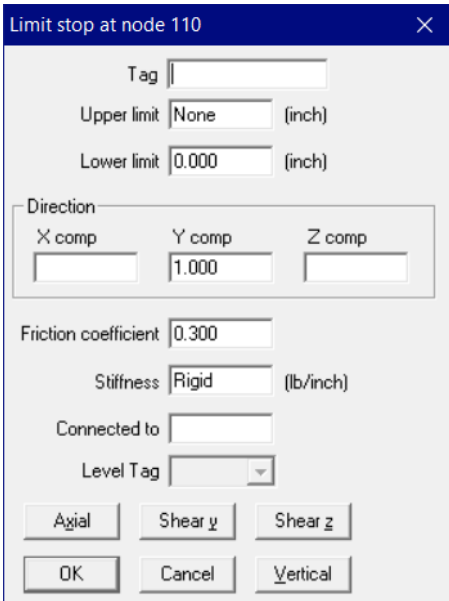
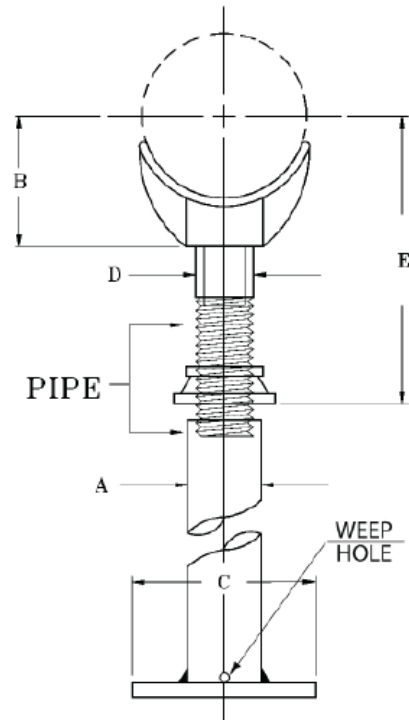
For details on Data Types such as Limit Stop, Restraint, Skewed Restraint, Snubber, etc., used in this document, refer to the corresponding sections in CAEPIPE Technical Reference Manual. This manual and other manuals of CAEPIPE can be downloaded from the link [sstusa.com/caepipe-docs.php](http://sstusa.com/caepipe-docs.php).

**FIG. 46**

**ADJUSTABLE PIPE SADDLE SUPPORT**

[www.pipingtech.com/fig46](http://www.pipingtech.com/fig46)

- MATERIAL:** Carbon steel saddle, locknut nipple, and special cast iron reducer, assembled. Base is not included - supplied as extra.
- SERVICE:** Stanchion type support where vertical adjustment is required.
- INSTALLATION:** Adjustment is obtained by turning the locknut nipple, the lower end of the nipple, and coupling during adjustment.
- ORDERING:** Specify pipe size, figure number, description and finish.



Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

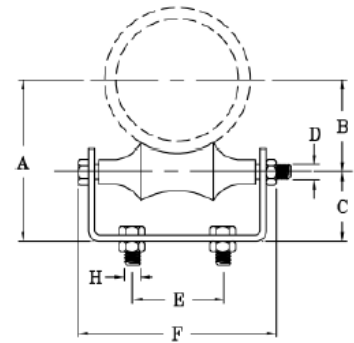
Particulars	Syntax	Support Data
Single Acting Translational Restraint		
+Y	Restraint Type(Stiffness:Gap:Friction Coefficient)	+Y(R:0:0.3)

**FIG. 210**

**ROLLER CHAIR**

[www.pipingtech.com/fig210](http://www.pipingtech.com/fig210)

- MATERIAL:** Cast iron roll, steel roll rod, steel continuous thread rods and hex nuts.
- SERVICE:** For support of pipe where horizontal movement due to expansion and contraction will occur and where vertical adjustment up to 6" may be necessary.
- HOW TO SIZE:**
1. If roll is to support bare pipe, select the size directly from nominal pipe size.
  2. If used with pipe covering protection saddle, see pipe insulation chart for size of pipe roll.
  3. If roll is to support covered pipe, the O.D. of the covering should not be greater than the O.D. of the pipe for which the roll was designed.
- ORDERING:** Specify pipe size, figure number, description and finish.

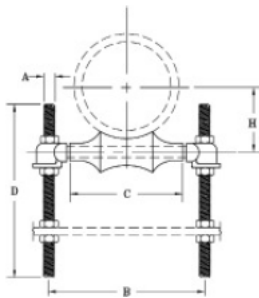


**FIG. 215**

**ADJUSTABLE PIPE ROLL SUPPORT**

- MATERIAL:** Cast iron roll and sockets, steel roll rod, steel continuous thread rods and hex nuts.
- SERVICE:** For support of pipe where horizontal movement due to expansion and contraction will occur and where vertical adjustment up to 6" may be necessary.
- SIZE:** If roll is to support bare pipe, select the size directly from nominal pipe size.
- ORDERING:** Specify pipe size, figure number, description and finish.

PIPE SIZE	APPROX. WEIGHT (lb. per 100)	A	B	C	D	H
1	113	3/8	3	1 1/2	9 1/2	1 1/16
1 1/4	117	3/8	3 3/8	1 7/8	9 1/2	1 1/4
1 1/2	120	3/8	3 5/8	2 1/8	9 1/2	1 3/8
2	125	3/8	4 1/8	2 5/8	9 1/2	1 5/8
2 1/2	229	1/2	4 7/8	3 1/8	9 1/2	1 15/16
3	242	1/2	5 1/2	3 3/4	9 1/2	2 1/4
3 1/2	269	1/2	6 1/8	4 1/2	10	2 9/16
4	375	5/8	6 3/4	4 3/4	10	2 13/16
5	469	5/8	8 1/16	5 13/16	10	3 7/16
6	757	3/4	9 9/16	6 7/8	11	4
8	1,101	7/8	11 15/16	8 7/8	11 3/4	5 1/8
10	1,374	7/8	14 1/16	11	11 3/4	6 3/8
12	1,936	7/8	15 13/16	12 1/2	11 3/4	7 7/16
14	3,116	1	17 3/4	14 1/4	11 3/4	8 3/8
16	4,245	1 1/8	19 3/4	16 1/4	18	9 7/16
18	4,655	1 1/8	21 7/8	18 1/4	18	10 1/2
20	6,623	1 1/4	24 1/4	20 1/4	18	11 5/8
24	10,252	1 1/2	28 5/8	24 1/4	24	14
30	18,681	1 7/8	35 1/2	30 1/4	24	17 7/16



[www.pipingtech.com/fig215](http://www.pipingtech.com/fig215)

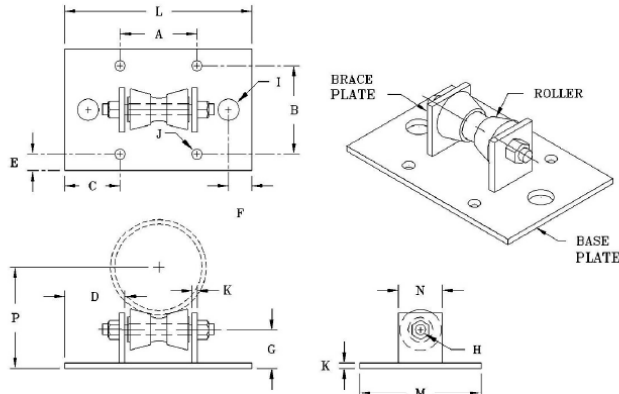
SCOMPONENTS06.XLS-07/01/09

**FIG. 230**

**ROLLER STAND**

www.pipingtech.com/fig230

- MATERIAL:** Cast iron roll and stand.
- SERVICE:** For support of piping that expands and contracts longitudinally and where vertical adjustment is not necessary.
- HOW TO SIZE:**
  1. If roll is to support bare pipe, select size from nominal pipe size.
  2. If used with pipe covering protection saddle, see FIG. 183 for size of pipe roll.
- INSTALLATION:** Two cored holes "I" for anchorage bolting purpose.
- ORDERING:** Specify pipe size, figure number, description and finish.



Enter the Friction coefficient as 0.0 or leave it as BLANK as the roller allows the pipe move freely axial direction.

Limit stop at node 110 ✕

Tag

Upper limit  (inch)

Lower limit  (inch)

Direction

X comp	Y comp	Z comp
<input type="text"/>	<input type="text" value="1.000"/>	<input type="text"/>

Friction coefficient

Stiffness  (lb/inch)

Connected to

Level Tag

Axial
Shear y
Shear z

OK
Cancel
Vertical

Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

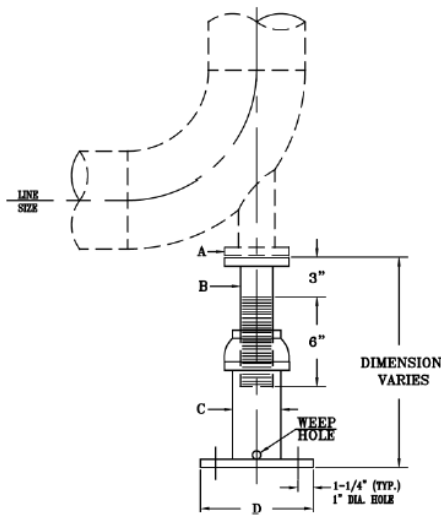
Particulars	Syntax	Support Data
Single Acting Translational Restraint		
+Y	Restraint Type(Stiffness:Gap:Friction Coefficient)	+Y(R:0:0.0)

**FIG. 260**

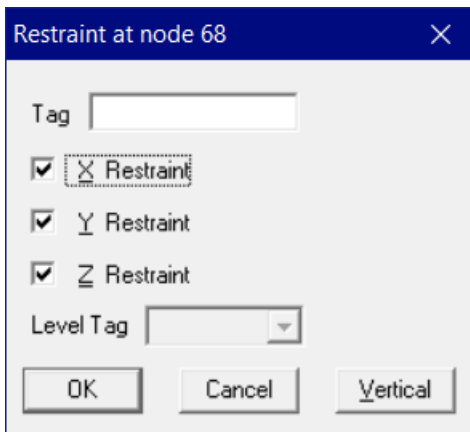
**ADJUSTABLE ELBOW SUPPORT**

www.pipingtech.com/fig260

- FINISH:** Black, galvanized or painted.
- SERVICE:** General piping.
- ORDERING:** Specify pipe size, figure number, description, finish and height.



From the figure above, it is assumed that the Flanges A and B are connected using Bolts and the Plate D at the bottom of the support is fixed to structure with Bolts. Accordingly, the support is modelled as a 3-way Restraint. In case the Flanges A and B are not connected using Bolts and are free to move in upward and lateral directions then the support can be modelled as a Limit Stop with a suitable friction coefficient.



Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
<b>Double Acting Translational Rigid Restraints</b>		
XYZ	X;Y;Z	X;Y;Z

# PTP HD-1

# HOLD DOWN (ANCHOR TYPE)

www.pipingtech.com/ptp-hd1

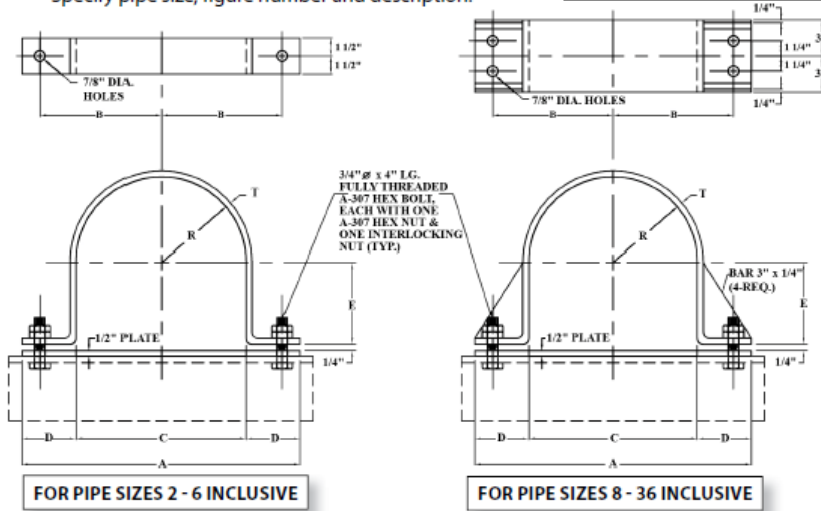
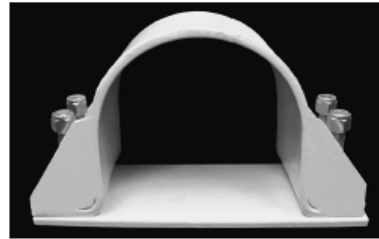
**MATERIAL:** Carbon steel

**FINISH:** Black or galvanized.

**TEMP.:** 750 °F

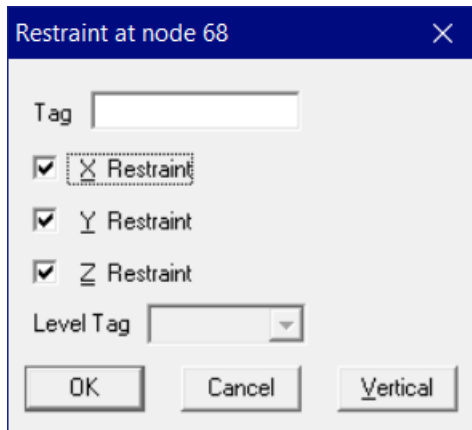
**APPLICATION:** Fig. PTP HD-1 is an anchor type hold down. This hold down is generally used on pipe lines where little or no insulation is required.

**ORDERING:** Specify pipe size, figure number and description.



It is assumed that the support shown above does not allow the pipe to move in all three translation directions. Accordingly, this support is modelled as a 3-way Restraint.

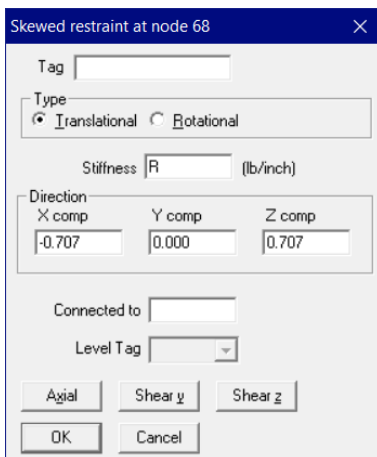
If the piping is parallel to any of the Global axis, then use Restraint as given below.



Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
<b>Double Acting Translational Rigid Restraints</b>		
XYZ	X;Y;Z	X;Y;Z

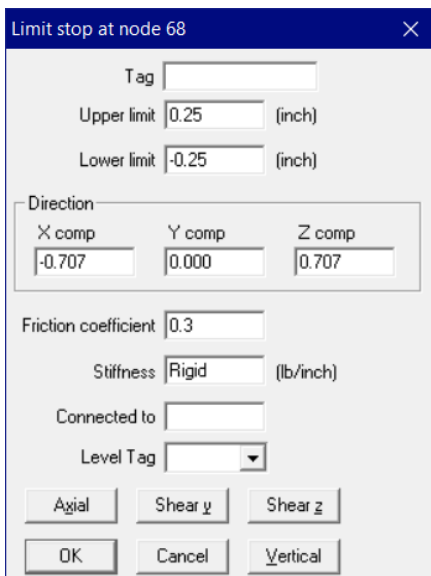
If the piping is skewed in horizontal plane or in 3D space, then use Skewed Restraint when Gap and Friction are 0 as shown below. For the snapshots provide below, the pipe is skewed in X and Z plane with Y axis as vertical.



Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
Double Acting Skewed Restraints in Local Axes*		
Axial	SKEWA(Stiffness:Gap:Friction Coefficient:Type) Type: R = Rotational Restraint T = Translational Restraint	SKEWA(Rigid:0:0:T)
Shear Y	SKEWY(Stiffness:Gap:Friction Coefficient:Type)	SKEWY(Rigid:0:0:T)
Shear Z	SKEWZ(Stiffness:Gap:Friction Coefficient:Type)	SKEWZ(Rigid:0:0:T)

If the piping is skewed in horizontal plane or in 3D space, with Gap and Friction non-zero, then model this support as a Limit Stop as given below.



Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
Double Acting Limit Stops in Local Axes*		
Axial	LIMA(Stiffness:Gap:Friction Coefficient) or LIMA(Stiffness:Lower Gap/Upper Gap:Friction Coefficient)	LIMA(R:0.25:0.3)
Shear Y	LIMY(Stiffness:Gap:Friction Coefficient) or LIMY(Stiffness:Lower Gap/Upper Gap:Friction Coefficient)	LIMA(R:0.25:0.3)
Shear Z	LIMZ(Stiffness:Gap:Friction Coefficient) or LIMZ(Stiffness:Lower Gap/Upper Gap:Friction Coefficient)	LIMA(R:0.25:0.3)

# PTP HD-2

# HOLD DOWN (LATERAL RESTRAINT)

www.pipingtech.com/ptp-hd2

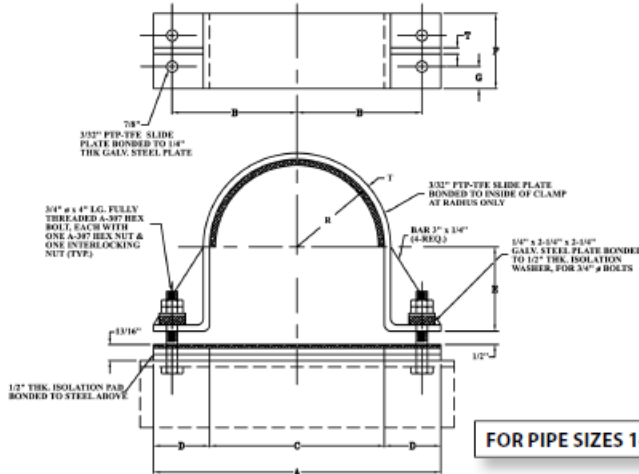
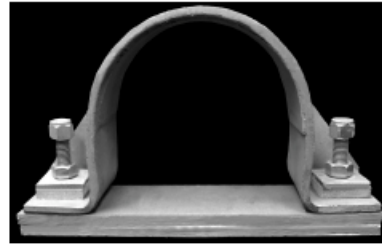
**MATERIAL:** Carbon steel

**FINISH:** Black or galvanized.

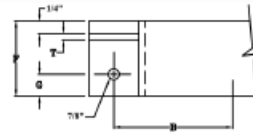
**TEMP.:** 400 °F

**APPLICATION:** Fig. PTP HD-2 is a restraint type hold down. The clamp radius as well as the base is lined with PT&P's PTFE, 25% glass filled, slide plate, allowing axial movement while restraining lateral movement. It is generally used on compressor lines where temperature is high and thermal movement is great.

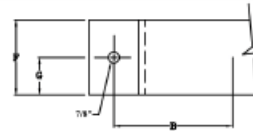
**ORDERING:** Specify pipe size, figure number and description.



FOR PIPE SIZES 6 - 12 INCLUSIVE



FOR PIPE SIZES 2 - 4 INCLUSIVE



FOR PIPE SIZES 14 - 36 INCLUSIVE

Guide at node 68

Tag

Friction coefficient

Stiffness  (lb/inch)

Gap  (inch)

Connected to Node

Level Tag

OK Cancel

**Note:**

Friction coefficient is input as 0.1 as the PTFE plate reduces the friction between the support and pipe surface.

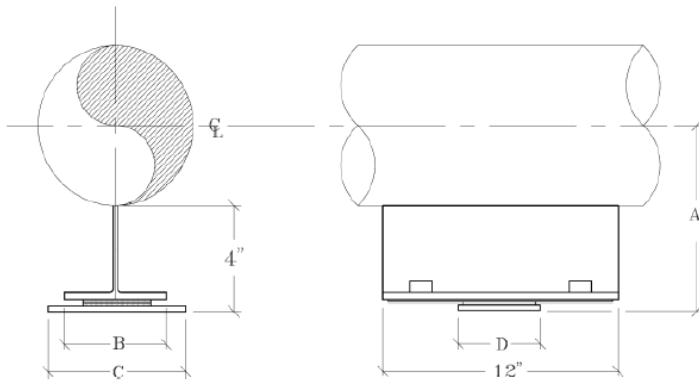
Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
<b>Guide</b>		
GUI	GUI(Stiffness:Gap:Friction Coefficient)	GUI(RIGID:0:0.10)

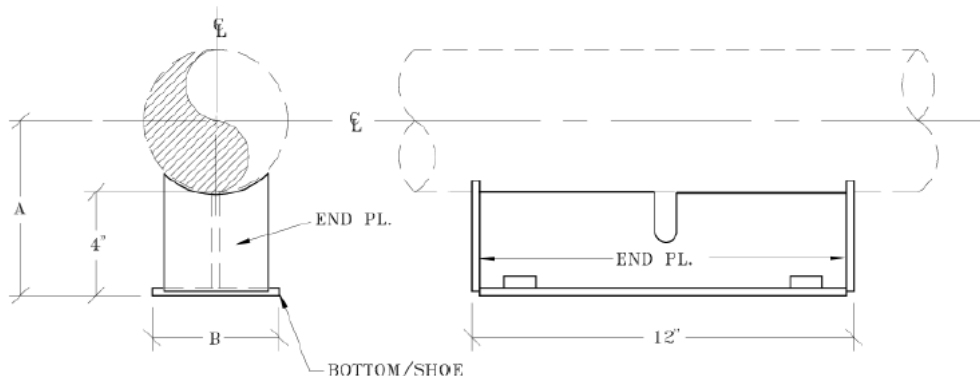


**FIG. 98****T-BAR WITHOUT CRADLE, WITH SLIDE PLATE  
CRADLED NON-GUIDED SUPPORT**[www.pipingtech.com/fig98](http://www.pipingtech.com/fig98)

- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, B, C, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.
- BONDING:** Graphite slide plates are usually bonded. For high temperature service above 500 °F specify bolted construction.

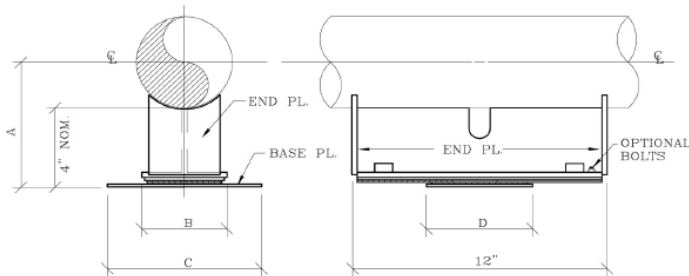
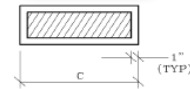
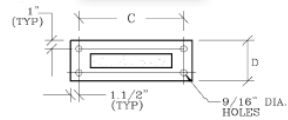
**FIG. 100****T-BAR CRADLE SUPPORT & STRUCTURAL ANCHOR  
CRADLED NON-GUIDED SUPPORT**[www.pipingtech.com/fig100](http://www.pipingtech.com/fig100)

- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A & B are available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical load depends upon the pipe pressure and wall thickness.

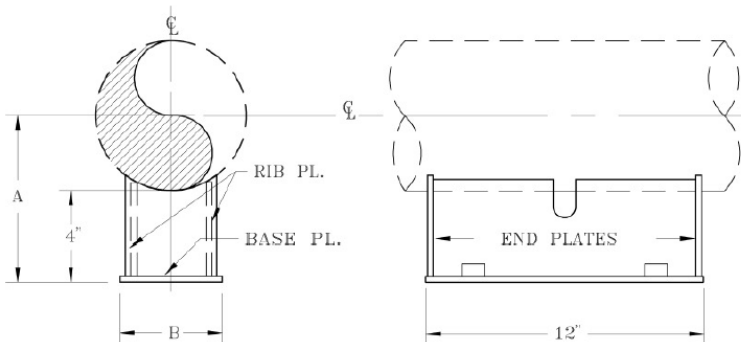


**FIG. 200****T-BAR CRADLE SUPPORT WITH BONDED/BOLTED SLIDE PLATES  
CRADLED NON-GUIDED SUPPORT**[www.pipingtech.com/fig200](http://www.pipingtech.com/fig200)

- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, B, C, D, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.
- BONDING:** Graphite slide plates are usually bonded. For high temperature service above 500 °F specify bolted construction.
- NOTE:**
- Optional bolted base plate, specify Fig. 201.
  - For upper graphite slide material to be of bolted design, specify Fig. 200-B or Fig. 201-B (see below).

**FIG. 200 - WELDED BASE****FIG. 201 - BOLTED BASE****FIG. 200 - B****FIG. 201 - B****FIG. 400****DOUBLE T-BAR CRADLE SUPPORT & STRUCTURAL ANCHOR  
CRADLED NON-GUIDED SUPPORT**[www.pipingtech.com/fig400](http://www.pipingtech.com/fig400)

- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, B, C, D, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.



## FIG. 500

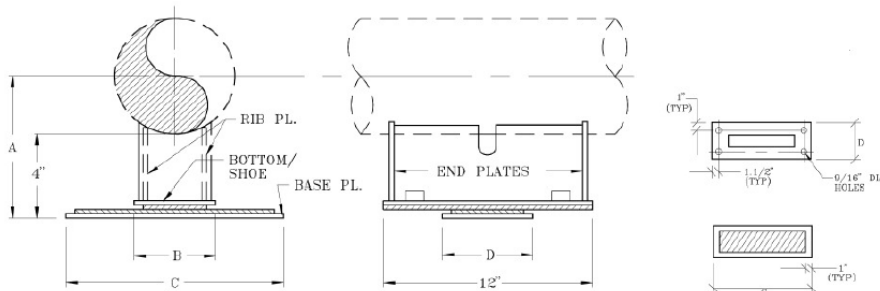
## DOUBLE-BAR CRADLE SUPPORT WITH BONDED/BOLTED SLIDE PLATE CRADLED NON-GUIDED SUPPORT

www.pipingtech.com/fig500

- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, B, C, D, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.
- NOTE:**
- Optional bolted base plate, specify Fig. 501.
  - For upper graphite slide material to be of bolted design, specify Fig. 500-B or Fig. 501-B (see below).

### FIG. 500 - WELDED BASE

### FIG. 501 - BOLTED BASE



## FIG. 700

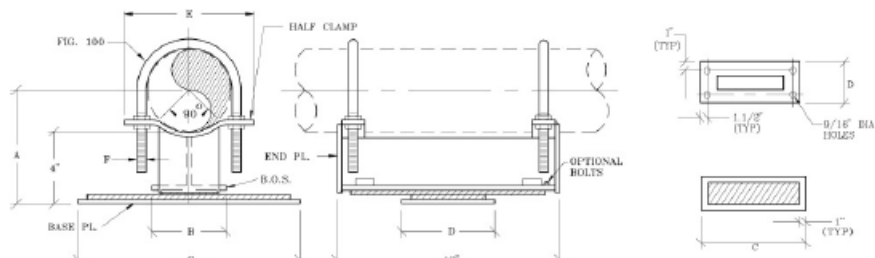
## U-BOLT CRADLE SUPPORT WITH BONDED/BOLTED SLIDE PLATE CRADLED NON-GUIDED SUPPORT

www.pipingtech.com/fig700

- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, B, C, D, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.
- BONDING:** Graphite slide plates are usually bonded. For high temperature service above 500 °F specify bolted construction.
- NOTE:**
- Optional bolted base plate, specify Fig. 701.
  - For upper graphite slide material to be of bolted design, specify Fig. 700-B or Fig. 701-B (see below).

### FIG. 700 - WELDED BASE

### FIG. 701 - BOLTED BASE

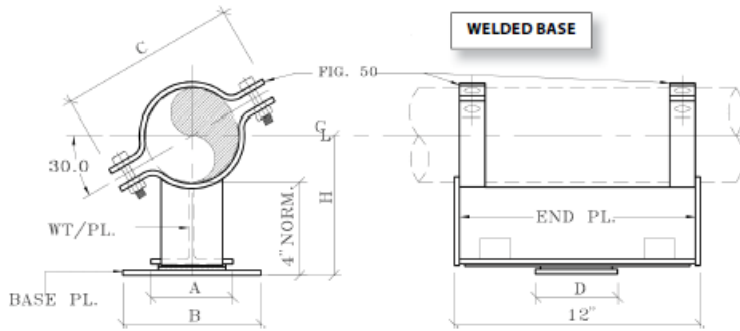


**FIG. 900**

www.pipingtech.com/fig900

**BOLT CRADLE SUPPORT WITH BONDED/BOLTED SLIDE PLATE  
CRADLED NON-GUIDED SUPPORT**

- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, B, C, D, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.
- BONDING:** Graphite slide plates are usually bonded. For high temperature service above 500 °F specify bolted construction.



**Limit stop at node 110** ✕

Tag

Upper limit  (inch)

Lower limit  (inch)

Direction

X comp	Y comp	Z comp
<input type="text"/>	<input type="text" value="1.000"/>	<input type="text"/>

Friction coefficient

Stiffness  (lb/inch)

Connected to

Level Tag

Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
Single Acting Translational Restraint		
+Y	Restraint Type(Stiffness:Gap:Friction Coefficient)	+Y(R:0:0.3)

**FIG. 300**

**T-BAR CRADLE SUPPORT WITH GUIDE & SLIDE PLATES  
CRADLED GUIDED SUPPORT**

[www.pipingtech.com/fig300](http://www.pipingtech.com/fig300)

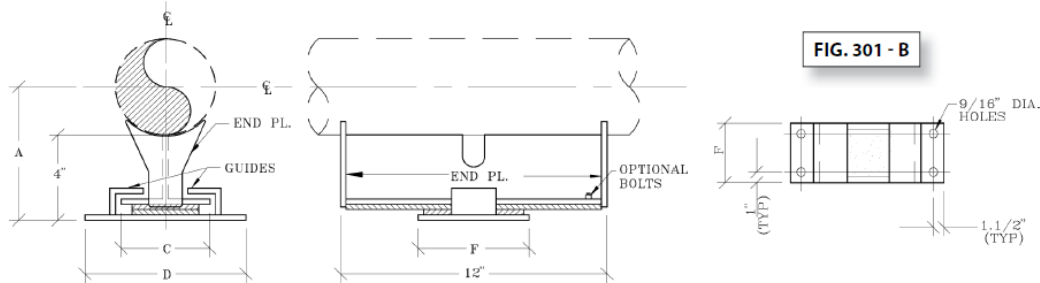
- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, C, D, F, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.
- BONDING:** Graphite slide plates are usually bonded. For high temperature service above 500 °F specify bolted construction.
- NOTE:**
- Optional bolted base plate, specify Fig. 301.
  - For upper graphite slide material to be of bolted design, specify Fig. 300-B or Fig. 301-B (see below).



**FIG. 300 - WELDED BASE**



**FIG. 301 - BOLTED BASE**



**FIG. 600**

**DOUBLE-BAR CRADLE SUPPORT WITH GUIDE & SLIDE PLATE  
CRADLED GUIDED SUPPORT**

[www.pipingtech.com/fig600](http://www.pipingtech.com/fig600)

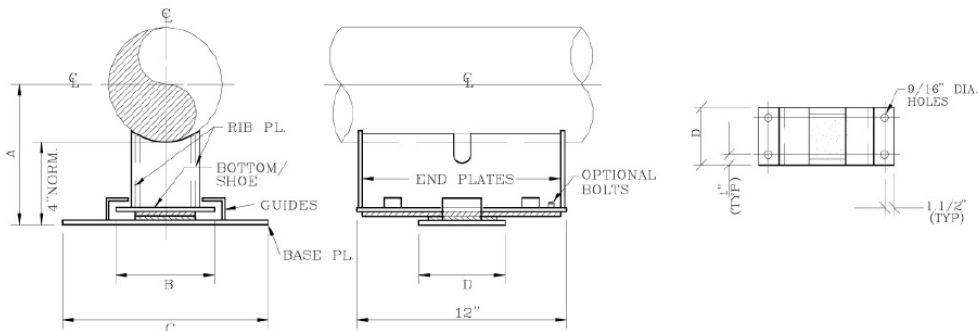
- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, B, C, D, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.
- BONDING:** Graphite slide plates are usually bonded. For high temperature service above 500 °F specify bolted construction.
- NOTE:**
- Optional bolted base plate, specify Fig. 601.
  - For upper graphite slide material to be of bolted design, specify Fig. 600-B or Fig. 601-B (see below).



**FIG. 600 - WELDED BASE**



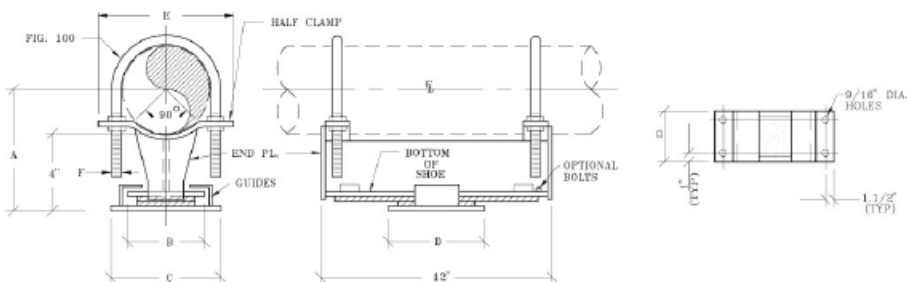
**FIG. 601 - BOLTED BASE**



**FIG. 800****U-BOLT CRADLE SUPPORT WITH GUIDE & SLIDE PLATE  
CRADLED GUIDED SUPPORT**

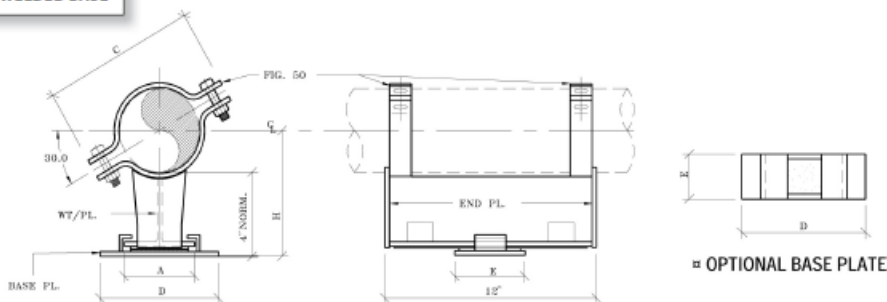
www.pipingtech.com/fig800

- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, B, C, D, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.
- BONDING:** Graphite slide plates are usually bonded. For high temperature service above 500 °F specify bolted construction.
- NOTE:**
- Optional bolted base plate, specify Fig. 801.
  - For upper graphite slide material to be of bolted design, specify Fig. 800-B or Fig. 801-B (see below).

**FIG. 800 - WELDED BASE****FIG. 801 - BOLTED BASE****FIG. 1100****BOLT CRADLE SUPPORT WITH GUIDE & SLIDE PLATE  
CRADLED GUIDED SUPPORT**

www.pipingtech.com/fig1100

- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, C, D, E, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.
- BONDING:** Graphite slide plates are usually bonded. For high temperature service above 500 °F specify bolted construction.

**WELDED BASE**

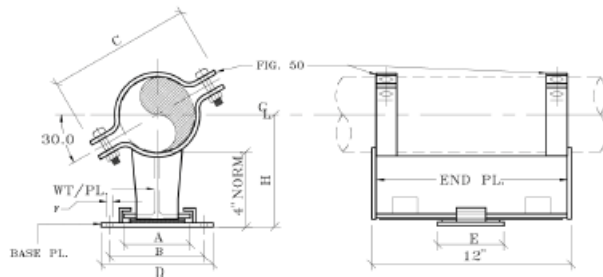
**FIG. 1200**

www.pipingtech.com/fig1200

**BOLT CRADLE SUPPORT WITH GUIDE & SLIDE PLATE  
CRADLED GUIDED SUPPORT**

- MATERIAL:** Carbon steel
- FINISH:** Painted or hot dipped galvanized.
- OPTIONS:** Modifications in the dimensions A, B, C, D, and the slide plate material (PTFE, 25% glass filled or graphite) available upon request.
- ORDERING:** Specify pipe size, figure number, description, type, quantity, finish and slide plate material.
- ALLOWABLE LOADS:** The allowable vertical loads depend upon the pipe pressure and wall thickness.
- BONDING:** Graphite slide plates are usually bonded. For high temperature service above 500 °F specify bolted construction.

**BOLTED BASE**



Guide at node 68 ? X

Tag

Friction coefficient

Stiffness  (lb/inch)

Gap  (inch)

Connected to Node

Level Tag

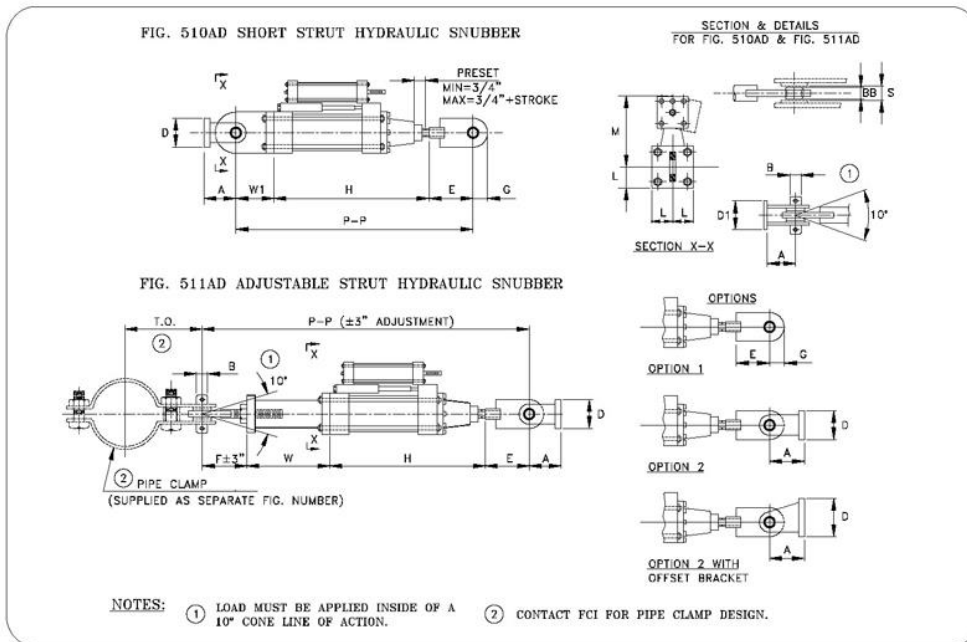
**Note:**

Friction coefficient is input as 0.1 as the PTFE plate reduces the friction between the support and pipe surface. If PTFE plate is not used in the support then change the friction coefficient to a higher value to account for the friction between the support and the structure.

Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
<b>Guide</b>		
GUI	GUI(Stiffness:Gap:Friction Coefficient)	GUI(RIGID:0:0.1)

## FIG 510AD SHORT STRUT & 511AD ADJUSTABLE STRUT HYDRAULIC SNUBBERS



### Application:

For use on piping systems or equipment when unrestrained thermal movement must be allowed, but which must be restrained during impulsive or cyclic disturbance. The unit is not effective against low amplitude, high frequency movement. The preferred usage with standard settings is to prevent destructive results due to earthquakes, flow transients, or wind load. Special settings are available to absorb the continuous thrust resulting from safety valve blow-off or pipe rupture.

## FIG. 550 & 555

## VIBRATION CONTROL & SWAY BRACE

- SIZE RANGE:** For pipe sizes 2" through 24".
- SERVICE:** Recommended for controlling vibration, absorbing shock loadings; guiding or restraining the movement of pipe resulting from thermal expansion; bracing a pipe line against sway.
- INSTALLATION:** The vibration control and sway brace is shipped ready for installation. The rod coupling rotates with slight resistance and the tension test collar can be rotated by hand while holding the rod stationary.
- ADJUSTMENT:** The sway brace should be in the neutral position when the system is hot and operating, at which time the tension test collar should be hand tight. If it is not, the sway brace should be adjusted to the neutral position by use of the load coupling. The screws in the tension test collar need not be loosened, since they serve only to secure it to the load coupling.
- FEATURES:**
- Vibration is opposed with an instantaneous counter force bringing the pipe back to normal position.
  - A single energy-absorbing pre-loaded spring provides two way action.
  - One spring saves space and simplifies design.
  - Spring has 3" travel in either direction.
  - Accurate neutral adjustment assured.
  - Enclosed spring excludes dirt and gives a clean, compact appearance.



# SWAY STRUTS

A sway strut is a device used to restrain movement of piping in one direction while providing for movement due to thermal expansion or contraction in another direction.



## TYPES & SIZES

- > [Sway Strut Information](#)
- > [Fig. 2110: Sway Strut with 4" of Adjustment](#)
- > [Fig. 2120: Mini-Sway Strut](#)
- > [Fig. 515: Sway Strut Assembly](#)
- > [Fig. 516: Adjustable Sway Strut Assembly](#)
- > [Fig. 2110 & 2120](#)

Use Snubber data in CAEPIPE to model the Snubber as shown above. Enter the direction based on direction of the Snubber.

If the piping is parallel to Global Z axis, with Snubber is in Global X, then define the Snubber as shown below.

Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Depending on the direction of the snubber, input the Support Data as shown below.

Particulars	Syntax	Support Data
<b>Double Acting Snubbers</b>		
XSNB	XSNB(Stiffness)	XSNB or XSNB(1E12)
YSNB	YSNB(Stiffness)	YSNB or YSNB(R)
ZSNB	ZSNB(Stiffness)	ZSNB or ZSNB(RIGID)
Skewed Snubbers	SNB(VecX:VecY:VecZ:Stiffness)	SNB(0.707:0.0:0.707:RIGID) or SNB(0:0:0.707:RIGID)
<b>Double Acting Snubbers in Local Axes</b>		
SNBA (Axial)	SNBA(Stiffness)	SNBA or SNBA (1E12)
SNBY (Shear Y)	SNBY(Stiffness)	SNBY or SNBY(R)
SNBZ (Shear Z)	SNBZ(Stiffness)	SNBZ or SNBZ(RIGID)

# Hangers

FIG. PTP-1 – TYPES A, B, & C – SHORT VARIABLE SPRINGS

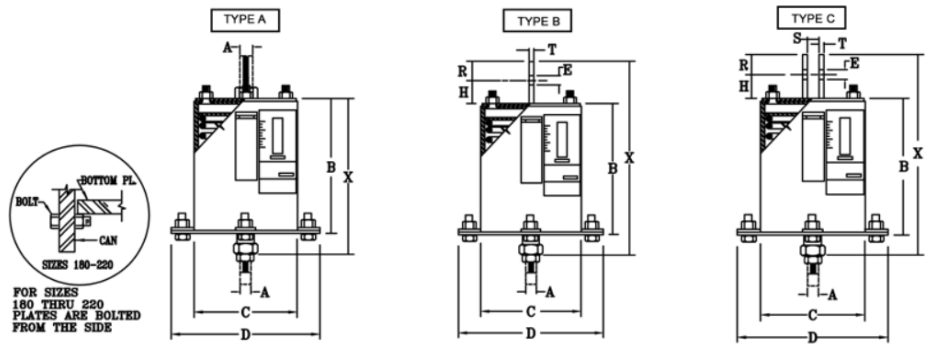
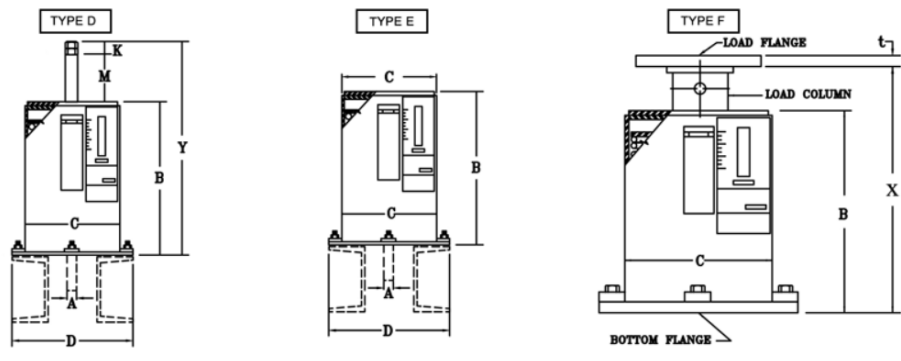


FIG. PTP-1 – TYPES D, E, & F – SHORT VARIABLE SPRINGS



Hanger at node 110 ? X

Tag

Type Grinnell

Number of Hangers 1

Load Variation 25 [%]

Hanger below  Short Range

Connected to

Level Tag

OK Cancel

**Note:**

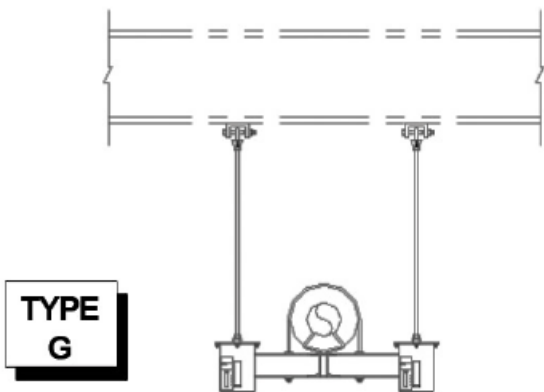
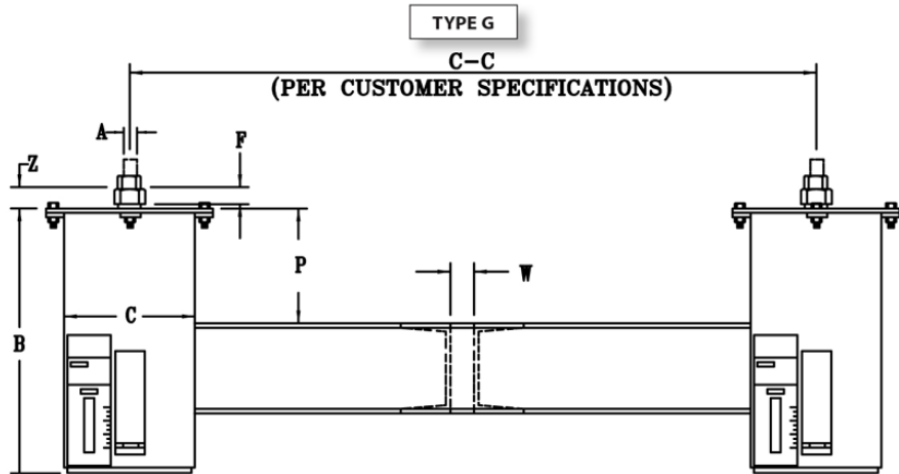
Turning ON the option “Hanger below” will show the Hanger Graphical Symbol below the Pipe in CAEPIPE without any changes to the mathematical model.

Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
<b>Spring Hangers</b>		
Hanger	Hanger(Type:No.of Hangers:All.Travel Limit:Load	Hanger(Grinnell :1: 25:1)

Variation:Short Range)

FIG. PTP-1 – TYPE G – SHORT VARIABLE SPRINGS



Hanger at node 110 ? X

Tag

Type Grinnell

Number of Hangers 2

Load Variation 25 (%)

Hanger below  Short Range

Connected to

Level Tag

OK Cancel

Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
<b>Spring Hangers</b>		
Hanger	Hanger(Type:No.of Hangers:All.Travel Limit:Load Variation:Short Range)	Hanger(Grinnell :2: 25:1)

FIG. PTP-2 - TYPES A, B, & C - STANDARD VARIABLE SPRINGS

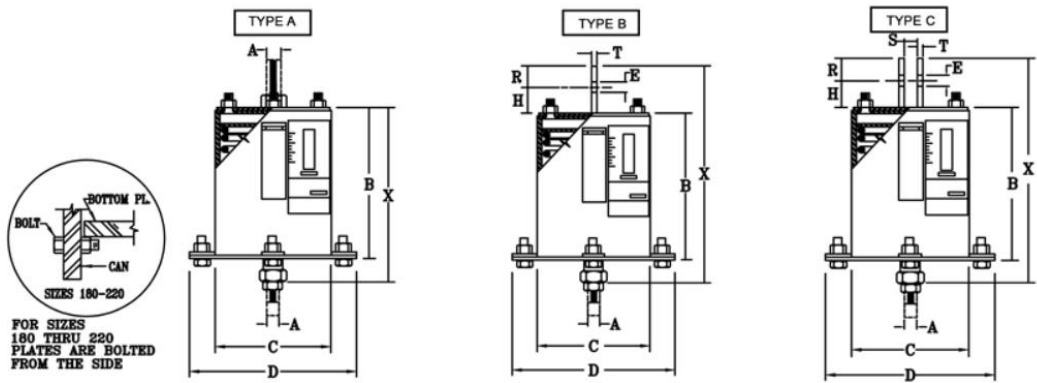
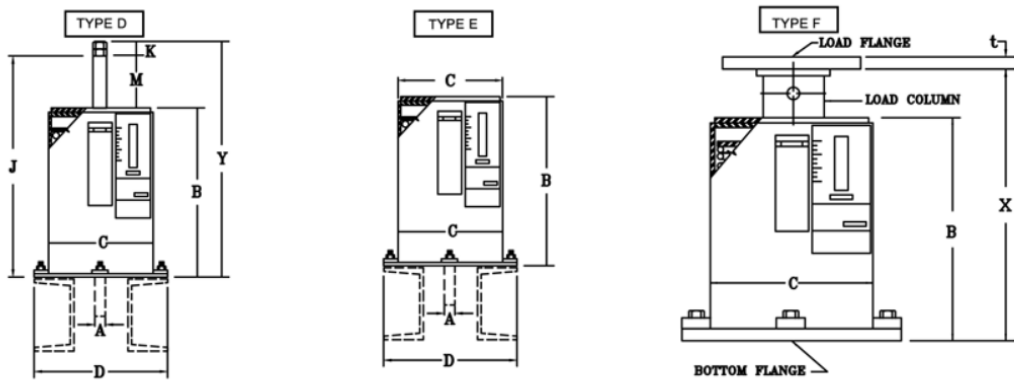


FIG. PTP-2 - TYPES D, E, & F - STANDARD VARIABLE SPRINGS



Hanger at node 110 ? X

Tag

Type Grinnell

Number of Hangers

Load Variation  (%)

Hanger below  Short Range

Connected to

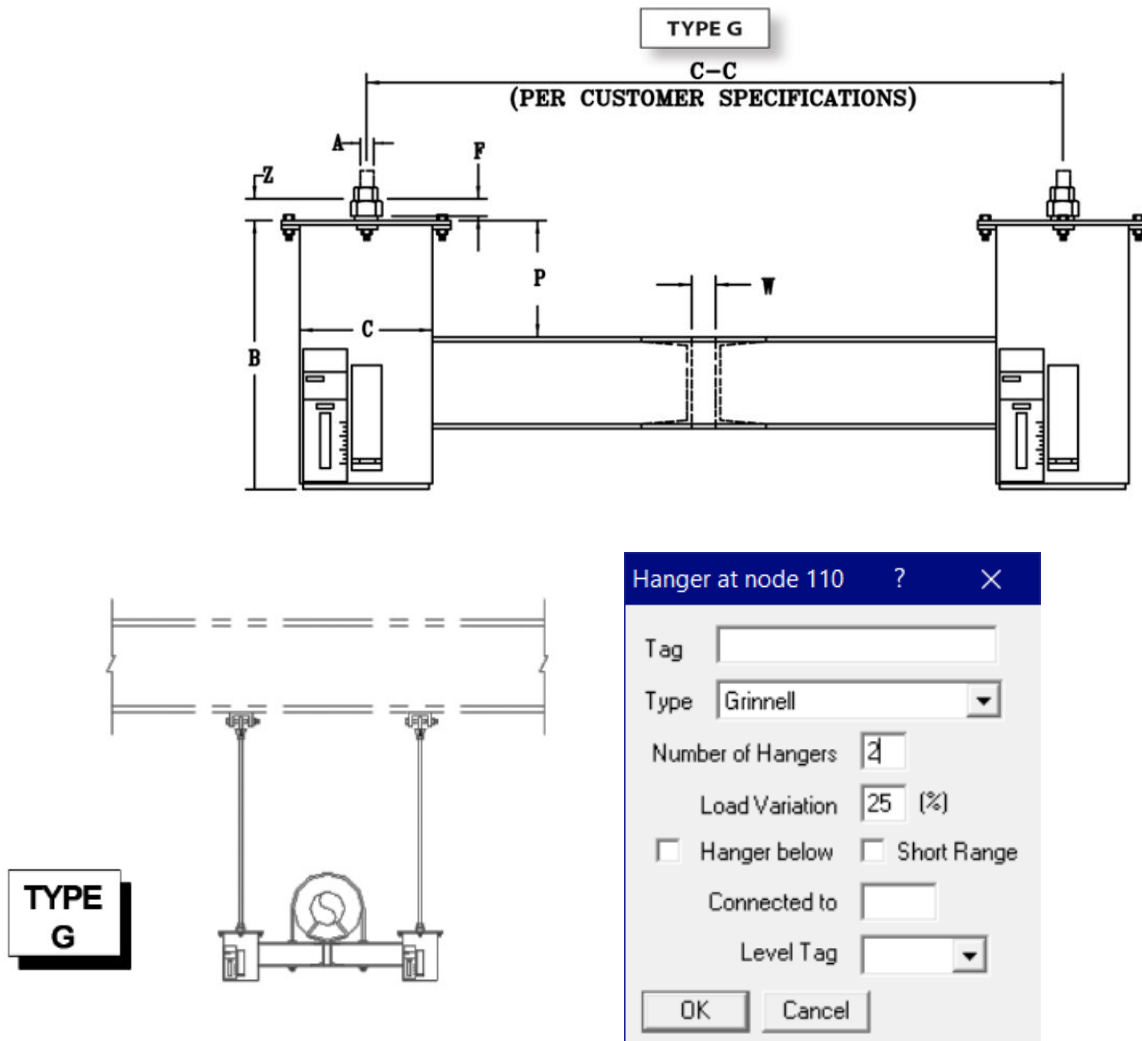
Level Tag

OK Cancel

Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
<b>Spring Hangers</b>		
Hanger	Hanger(Type:No. of Hangers:All.Travel Limit:Load Variation:Short Range)	Hanger(Grinnell :1: 25)

FIG. PTP-2 – TYPE G – STANDARD VARIABLE SPRINGS

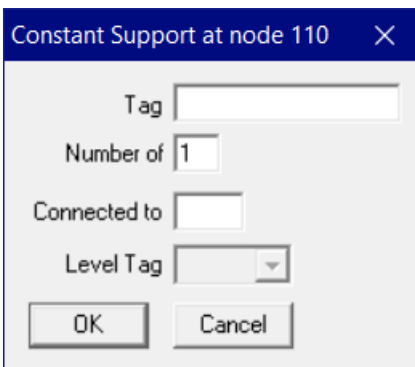
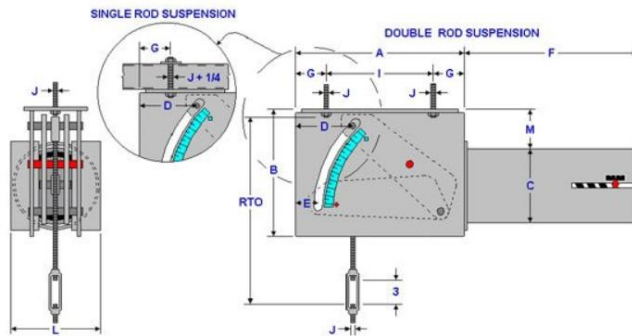


Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
<b>Spring Hangers</b>		
Hanger	Hanger(Type:No.of Hangers:All.Travel Limit:Load Variation:Short Range)	Hanger(Grinnell :2: 25)

# CONSTANT SPRING SUPPORTS

Constants use a spring coil (or series of coils) to accommodate pipe movement from the initial (installed) condition to the final (operating) condition of the piping system. For all constant spring supports there is no difference in load and the supported load will remain uniform throughout the deflection cycle.



Support Mapping Code for PD2CAEPIPE / checkSTRESS / HOTclash / CAEPIPE 3D+

Particulars	Syntax	Support Data
<b>Constant Support Hangers</b>		
Constant Support Hanger	Hanger(CONSTSUPPORT:No.of Hangers)	Hanger(CONSTSUPPORT)